Synthesis Study: Effectiveness of Safety Corridor Programs, Report on Tasks 1–3

Final Report
July 2008

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16. Abstract

This report synthesizes the safety corridor programs of 13 states that currently have some type of program: Alaska, California, Florida, Kentucky, Minnesota, New Jersey, New Mexico, New York, Ohio, Oregon, Pennsylvania, Virginia, and Washington. This synthesis can help Midwestern states implement their own safety corridor programs and select pilot corridors or enhance existing corridors.

Survey and interview information about the states' programs was gathered from members of each state department of transportation (DOT) and Federal Highway Administration (FHWA) division office. Topics discussed included definitions of a safety corridor; length and number of corridors in the program; criteria for selection of a corridor; measures of effectiveness of an implemented safety corridor; organizational structure of the program; funding and legislation issues; and engineering, education, enforcement, and emergency medical service strategies. Safety corridor programs with successful results were then examined in more detail, and field visits were made to Kansas, Oregon, Pennsylvania, and Washington for first-hand observations.

With the survey and field visit information, several characteristics of successful safety corridor programs were identified, including multidisciplinary (3E and 4E) efforts; selection, evaluation, and decommissioning strategies; organization structure, champions, and funding; task forces and Corridor Safety Action Plans; road safety audits; and legislation and other safety issues. Based on the synthesis, the report makes recommendations for establishing and maintaining a successful safety corridor program.

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SYNTHESIS STUDY: EFFECTIVENESS OF SAFETY CORRIDOR PROGRAMS, REPORT ON TASKS 1–3

Final Report
July 2008

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EXECUTIVE SUMMARY

The need for a comprehensive synthesis of safety corridor programs throughout the nation was expressed by several Midwestern states to more effectively implement programs and select pilot corridors in their respective states. Information was gathered from 13 surveyed states that currently have some type of safety corridor program. The 13 states include Alaska, California, Florida, Kentucky, Minnesota, New Jersey, New Mexico, New York, Ohio, Oregon, Pennsylvania, Virginia, and Washington. Members of each state department of transportation (DOT) and Federal Highway Administration (FHWA) division office were contacted and interviewed about their respective programs.

After the safety corridor contacts were surveyed, the activities and practices of each state's program were summarized. Among other topics, definitions of a safety corridor; length and number of corridors in the program; criteria for selection of a corridor; measures of effectiveness of an implemented safety corridor; organizational structure of the program; funding and legislation issues; and engineering, education, enforcement, and emergency medical service strategies were all discussed with the state contacts and were compiled.

Safety corridor programs with successful results were then examined in more detail for examples to include in the synthesis. Field visits were made to Kansas, Oregon, Pennsylvania, and Washington to speak with transportation professionals about needs for the synthesis and to observe safety corridors firsthand. Both rural and urban corridor examples are discussed, including Alaska's Seward Highway, California's SR 41/46, Pennsylvania's Roosevelt Boulevard, Virginia's I-81, and Washington's SR 14.

The information gathered from the states surveyed and specific field visits allowed for the identification of a number of characteristics of successful safety corridor programs. The compilation and dissemination of these characteristics provide guidelines for developing a safety corridor program, as well as enhancing an existing one so that it may operate as efficiently and effectively as possible. The following subject areas of successful programs are presented:

- Multidisciplinary efforts that include engineering, education, and enforcement (3E) or engineering, education, enforcement, and emergency medical services (4E)
- Selection, evaluation, and decommissioning strategies
- Organization structure, champions, and funding
- Task forces and Corridor Safety Action Plans
- Road safety audits
- Legislation and other safety issues

Based on the information gathered, recommendations for establishing and maintaining a successful safety corridor program are included in the report.

1. INTRODUCTION AND PROJECT FORMULATION

Several states across the United States have developed safety corridor programs. These are programs that have identified corridors with safety issues, including but not limited to high crash frequencies or rates, and use a team to identify treatments and strategies to improve the safety of the corridors. This project will develop a synthesis of safety corridor programs conducted throughout the country and identify the most promising practices and programs to share among the Federal Highway Administration (FHWA) Region 7 states of Missouri, Nebraska, Kansas, and Iowa. The purpose is to contribute to the safety management programs of the Region 7 states to facilitate those states' implementation of the best practices. This particular activity was identified by the Region 7 states at the St Joseph Safety Forum in March 2006. This activity is especially timely, as the SAFETEA-LU national highway legislation has provided the states with safety data improvement grants (Section 408 funds) and the FHWA's Highway Safety Improvement Program (HSIP) Section 1401 directs states to report the top 5% of the high-crash roads in the state.

Members of the Iowa, Kansas, and Missouri departments of transportation (DOTs) and respective FHWA division offices, along with researchers at Iowa State University's Center for Transportation Research (CTRE) and the University of Missouri-Columbia's Civil Engineering Department, discussed the advantages of conducting a comprehensive study of nationwide efforts in safety corridor development to more appropriately designate and implement safety corridors in the Midwest. Due to the lack of a comprehensive safety corridor program in the participating states, these stakeholders identified and discussed the following topics, among other concerns: the definition of a safety corridor, possible criterion for selection and practices for filtering high-crash locations in Region 7 states, measures of effectiveness (MOEs) for safety corridors, and states that currently have safety corridors.

1.1. Definition of a Safety Corridor

Currently, there are many differing opinions about what constitutes a safety corridor among the states. Some safety corridors may only be a few hundred feet in length and contain only a couple of intersections, while others may consist of a section of roadway over 50 miles in length. It would seem advisable that a corridor be somewhat homogenous, with reasonably uniform characteristics from beginning to end, no matter what the length. Region 7 states have higher concerns for rural two-lane highways. However, successful safety corridors have been established on multilane roadways in urban areas as well.

Safety corridors can be contrasted with enforcement corridors, both of which are employed in many states. Enforcement corridors can typically address long sections of a higher traffic volume highway to ensure maximum benefits from focused enforcement. Generally, the enhanced enforcement is the only activity applied and usually only for a single day. Safety corridors, by contrast, usually involve shorter sections of a roadway (typically 2–20 miles) and are selected in recognition of higher-than-average serious crash numbers. A safety corridor is active for at least one year, generally longer. Safety improvements are selected and applied using a multidisciplinary approach, which might include low-cost engineering improvements, enhanced

enforcement efforts, public information and education efforts, and involvement by emergency response agencies. Safety corridors can also be designated as Corridor Safety Improvement Programs (CSIP). The FHWA published guidelines for CSIPs in 1996.

1.2. Current Region 7 Filtering Practices for High-crash Locations

After a safety corridor is defined, the next logical step is to develop criteria for a state's roadway system to focus on the most dangerous locations. Each of the stakeholder states has different query techniques when filtering and targeting the roadways most in need of safety improvements. The Missouri Department of Transportation (MoDOT) uses the highest fatal and disabling injury crash frequencies over a segment. Using a floating window technique with a specified time length and segment length, MoDOT is able to identify the most crucial roadways to improve. MoDOT has chosen to go away from the typical "crash rate" analysis due to its recent focus on corridor-wide and system-wide safety. System treatments often cost the same regardless of traffic volume, so applying them to the highest frequency routes affects the highest number of severe crashes statewide. Additionally, a broader look at the entire Missouri system (including local roads) is currently not possible with crash rates, since traffic counts are not available for many of the non-state roads. The Kansas Department of Transportation (KDOT) filters its top 5% of roads in terms of number of crashes plus a crash rate and develops a combined crash index, and then KDOT ranks the roads by functional classification. KDOT would like the synthesis to specifically cover rural corridors and ways the programs are disseminated to local jurisdictions. The Iowa Department of Transportation (Iowa DOT) simply uses a crash rate based on fatal and major injury crashes to filter its high-crash locations.

1.3. Safety Measures of Effectiveness

Once safety corridors have been selected and implemented, MOEs must be analyzed to determine whether the improvements were beneficial. MoDOT, KDOT, and Iowa DOT all suggested several MOEs that they often use when checking their safety improvements. Some of the MOEs include a reduction in speeds greater than 10 mph over the posted speed limit, a decrease in 85th percentile speeds, crash reductions, contacts and interviews with drivers, ticketed violations, reduction of DWIs (when relevant), and a focus on the decrease of deaths and injury accidents. All of these suggestions are good MOEs, and more will be documented from states with comprehensive safety corridor programs. Most states felt that while crash, death, and injury reductions would be valuable, statistically it would be a very difficult measure to have confidence in.

1.4. States with Safety Corridor Programs

Through research and discussions with the stakeholders, a total of 13 states have been identified with some sort of safety corridor program. Not all have a comprehensive program, but some parts of a program (e.g., enforcement, engineering) can be incorporated to ensure a thorough synthesis. The following states have been identified and studied: Alaska, California, Florida, Kentucky, Minnesota, New Jersey, New Mexico, New York, Ohio, Oregon, Pennsylvania, Virginia, and Washington.

1.5. Other Concerns/Talking Points

The stakeholders also voiced other issues of a comprehensive safety corridor program that they would like to be reported in the synthesis. The legal side of enforcement and education in safety corridors is a specific concern for the DOTs. It is also important to know how to achieve approval from legislatures to double fines or increase enforcement. Another issue is how the local highway patrol identifies driving-while-intoxicated (DWI) arrests, alcohol-related crashes, and other incidents within safety corridor.

The overall goal for the safety corridor synthesis is not to make specific recommendations about the definition of a safety corridor or about MOEs that can be applied. Rather, the main concern is a synthesis of what works in other states and how similar effective measures can be applied to Region 7 states. A matrix-style table for identifying those characteristics of safety corridors that have enough value to be considered in other states is the ultimate goal for this study.

The next task in this research project is for the Iowa DOT to use this synthesis of safety corridor characteristics as it selects and implements a limited number of pilot safety corridors. CTRE at Iowa State University, in cooperation with the Iowa DOT, will be conducting the next task for the project. Results will be reported separately.

2. OVERVIEW OF CURRENT SAFETY CORRIDOR PROGRAMS

Information collected from the studied programs was attained through informal telephone interviews or meetings with state DOT or FHWA traffic/safety engineering representatives, unless the information is identified as having come from a formal document. State, local, and federal safety corridor contacts can be located in Appendix A.

2.1. Alaska

In 2006, the governor of Alaska signed into law a bill giving the Alaska Department of Transportation and Public Facilities (DOT&PF) the ability to designate "Safety Zones" within stretches of highway that have unacceptably high fatal and major injury crash rates. Alaska's main concern is eliminating two-lane, high-speed, head-on collisions while following the SAFETEA-LU mandate to focus on severe injury and fatal crashes. Alaska considers Traffic Safety Corridors as designated "safety zones," similar to school zones or work zones. The legislation can be found in Appendix B. The Alaska DOT&PF, Alaska State Troopers, and the Alaska Highway Safety Office are all included in the safety corridor program, as are other stakeholders involved in the multidisciplinary engineering, education, and enforcement (3E) approach.

Typical elements of Alaskan safety corridors include targeting reckless, intimidating, aggressive, and drunk driving (TRIAD), with a concerted effort of increased education, enforcement, and engineering. Safety corridors are typically two-lane rural highway segments, about 10–20 miles in length, where violations incur double fines or double points legislation. Incident response is expedited, media campaigns are repeated, and some engineering treatments are used, such as special safety corridor signs or center line rumble strips.

Alaska's criteria for designating a safety corridor are as follows:

- Roadway segments must be designated as either interstate, rural major arterial, rural major collector, or rural minor arterial with an average daily traffic (ADT) figure of 2,000 or more.
- Roadways must have a three- to five-year fatal and major injury crash rate per mile exceeding 110% of the statewide average for rural arterials.
- Roadways must have a three- to five-year fatal and major injury crash rate per 100 million vehicle miles exceeding 110% of the statewide average for rural arterials.
- The Alaska DOT&PF must agree on a coordinated traffic control/patrol plan.
- It must be agreed that the corridor's efforts will be effective in reducing crashes.
- The local police define the amount of enforcement needed to increase safe driving and to provide ongoing enforcement.
- No more than 10 safety zones at one time can be designated in Alaska.
- A safety corridor should be no shorter than five miles in length.
- A safety corridor is decommissioned when the fatal and major injury crash rate per mile falls below the statewide average for a three-year period.

A task force composed of members from agencies involved in the 3E approach is formed once the corridor is identified. The task force typically meets to review strategies and update the planned efforts. A formal education/media campaign to promote safety corridors is typically divided into three parts: initial rollout, saturation media, and ongoing media. The initial rollout usually begins with the official signing and unveiling of a safety corridor by members of the Alaska DOT&PF and other public officials. This event will help to gain publicity for the safety corridor and make drivers aware of the campaign. Other aspects of the initial rollout that accompany the actual safety corridor signing include both television and radio advertisements. The saturation media campaign is a heavy push for publicity for the corridor during the two weeks prior and the two weeks after the designation of a safety corridor. There are also saturation periods during driving-under-the-influence (DUI) crackdowns and the holiday season. These are specialty advertisements targeted toward the highest "risk-takers" or, more specifically, males aged 18–35. The education campaign tries to include ongoing media efforts, such as weekly radio and television spots. Sample safety corridor designation signature forms and the meeting minutes from a task force annual meeting can be found in Appendix D.

Safety corridor engineering efforts in Alaska include a road safety audit (RSA) conducted by a multidisciplinary task force to identify possible engineering, education, and enforcement opportunities. Possible short-term and long-term engineering strategies include, but are not limited to, center line and shoulder rumble strips, upgraded signing, a reevaluation of the posted speed limit, additional lanes/passing lanes, widening of medians, addition of median barriers, and changes to the roadway geometry. All speed limit signs in the corridor are upgraded or safety zone placards are added to existing signs, and signs have no more than a three-mile spacing. The safety corridor sign in Figure 1 and an "End Double Traffic Fines" sign legally designate the beginning and the end of the safety corridor.

Figure 1. Alaska safety corridor sign

2.2. California

The California safety corridor program is different from other states' programs in that it is administered by the California Highway Patrol (CHP). The program began in 1992 in the Special Projects Section of the CHP. California has general safety corridors and specific problem corridors relating to pedestrians, trucks, and impaired drivers. A safety corridor, defined as a roadway section of usually less than 50 miles with a high incidence of injury and fatal collisions over three year, can be designated if the crash rate is sufficiently high. A task force is formed for

each corridor. Support is provided for up to six corridors a year from Federal 402 funds, and an engineering, enforcement, and education (3E) approach is most often used.

The task forces are made up of members from the California Department of Transportation, the state Council of Governments, assorted planning groups, fire and police departments, legislative members, and citizen groups. The task force meets approximately four times during a 12-month program operations phase to conduct a field review; draft a Safety Action Plan (SAP) that is updated at each meeting, complete with a compilation of recommendations; and develop a logo and a slogan for the corridor to use in public education campaigns. Sample safety corridor slogans used by the task forces can be found in Appendix C. Many different attributes of the corridor are discussed when considering possible solutions, such as primary collision factors, types of collisions, the time of day when collisions occur, and collisions by month. Potential short- and long-term solutions are written into the SAP to address the corridor's main contributing factors for crashes. The task force must implement at least two of the potential solutions, usually overtime enforcement and a public awareness and education campaign. Significant for these corridors is the education component, which consists of billboard messages, school programs, and handout materials such as stickers, note pads, key chains, and flyers. The overall goal of a safety corridor is to decrease fatal and injury crashes by 10%.

Additional information about California's safety corridor program is available at http://www.chp.ca.gov/highways/corridor.html.

2.3. Florida

Florida does not have as formal a safety corridor program as some other states, but the Florida Department of Transportation (FDOT) sets up locally based groups of highway safety advocates called Community Traffic Safety Teams (CTSTs). The CTSTs are committed to solving traffic safety problems through a comprehensive, multi-jurisdictional, multidisciplinary approach. The CTST is comprised of members from city, county, state, and occasionally federal agencies, as well as private industry representatives and local citizens. These teams can be formed for one city, an entire county, portions of counties, or multiple counties. A common CTST goal is to reduce the number and severity of traffic crashes within the community by focusing on driver behavior, the vehicle, the roadway, and pedestrians. For corridors that the CTSTs focus on, the length and number of projects depends heavily on the amount of funds available. Each district uses both the frequency and severity of crashes as criteria for selection. Crash analyses are done before and after countermeasures are put in place to look for trends and specific areas to target with minor engineering projects, education programs, and extra enforcement. Each FDOT district has a CTST coordinator working with the teams in the district's area, while the Central FDOT Safety Office is the liaison to the district coordinators. Each CTST has approximately 20 regular volunteer members from the engineering, enforcement, education and emergency medical services (4E) disciplines, with around 60 CTSTs statewide. In 1994, the CTST Coalition was formed to facilitate the sharing of safety programs, ideas, and materials to a statewide audience through the individual CTSTs in Florida.

2.4. Kentucky

The Kentucky Transportation Cabinet's (KYTC) safety corridor program applies the 4E concept over one corridor in each of the state's 12 districts. These corridors are mostly rural highways that run through approximately three counties and are over 50 miles in length. Currently, safety-conscious planning funds are being used for a half-time safety professional in each of Kentucky's 15 area development districts, which are similar to regional planning commissions. As a part of the planning process for the safety corridor, an RSA is conducted to identify potential low-cost engineering improvements to be implemented using specifically budgeted KYTC money for this application. Additionally, the KYTC may develop supplemental safety programs at high schools that are located within or near the safety corridor.

The process used in identifying safety corridors was developed by researchers at the Kentucky Transportation Center at the University of Kentucky (Green and Agent 2002). First, an initial list of roadways is formulated, usually by length and excluding interstates and parkways. Next, one corridor in each district is selected using these criteria:

- The roadway must travel through more than one county in that district.
- It must be of sufficient length for a corridor (typically greater than 50 miles).
- It must have a relatively high traffic volume.
- It must not be a fully access-controlled highway (i.e., a freeway).
- It must have a relatively high number of crashes (total and injury/fatal).
- It must have a high crash rate (total and injury/fatal).
- It must be above a collector functional classification.

The next step is to rank the corridors in each of the districts using proportions for each attribute, as mentioned above, by dividing by the maximum value in the district. A subjective relative importance is given to each of these factors using nine different scoring methods of attribute importance. Lastly, points are totaled for each corridor in the district, and the highest total point value is selected for implementation.

A road safety review is then conducted for each of the chosen corridors, including a videotaped drive-through, so that the safety characteristics of the roadway, intersections, and driveways may be analyzed. After the road safety review, a crash analysis of the corridor is performed. Crash characteristics such as type, time, and severity are compared with the statewide characteristics for all crashes, and injury or fatal crashes are compared separately. Spot locations of 0.1 and 0.3 miles, as well as 1.0 mile roadway sections, are identified as having the highest number and rate of crashes. After the initial list of high-crash locations and sections is determined, the crash rate for each location is compared to the critical rate for that location to determine a critical rate factor (CRF). Spots and sections with a CRF of 1.0 or greater are further inspected for possible low-cost engineering solutions and enforcement strategies.

Additional information about Kentucky's safety corridor program is available at http://www.fivco.org/drivesmart.html.

2.5. Minnesota

Minnesota's Toward Zero Death (TZD) initiative, a subset of the Comprehensive Highway Safety Plan (CHSP), is a multiagency partnership that includes representatives from the Minnesota Department of Transportation (Mn/DOT), the Department of Public Safety (DPS), the state highway patrol, the FHWA, the Minnesota Department of Health, the Center for Transportation Studies at the University of Minnesota, area planning agencies, and other local safety partners, counties, and cities. Corridors are typically identified as part of the TZD initiative by Mn/DOT and DPS. The goal of the TZD initiative is to raise awareness of traffic safety issues and to develop tools that can be used to reduce the number of deaths and injuries by implementing practical, innovative ideas and best practices developed from research at the University of Minnesota and the state agencies.

The TZD program team works with local communities and corridor safety coalitions (similar to Florida's CTSTs) to improve the traffic safety of a designated area through short-term, low-cost alternatives to traditional engineering solutions. The safety corridors employ a 4E concept usually based on the results of an RSA. As part of the CHSP, counties may solicit Mn/DOT for safety corridor funding. In 2005, 27 counties were granted a total of $2 million to assist in deploying low-cost, systematic, proactive safety improvements such as RSAs, guardrail and turn lane improvements, shoulder widening, enhanced signing, and intersection lighting.

One TZD corridor in Isanti County has achieved good results with a program primarily focused on impaired driving and seat belt usage. Cooperative efforts by law enforcement, engineering agencies, schools, news media, and even a local judge have been effective. Funding for activities other than low-cost engineering improvements is provided by Safe Communities federal funding.

2.6. New Jersey

New Jersey's safety corridor program started in 2003 with 13 initial corridors of approximately 10 miles in length. New Jersey's selection criterion is a three-step process. First, a scan of all state numbered roads for six or more fatal crashes is performed. Next, roadways with six or more fatal crashes are analyzed in 10-mile segments for 1,000 or more total crashes over the previous three years. Lastly, a crash rate is calculated by roadway cross-sectional type (nine types), and a roadway is selected if the section crash rate is 50% higher than the state crash rate average for that particular roadway cross-section. A Safety Impact Team made up of representatives from the New Jersey Department of Transportation, the FHWA, and the National Highway Traffic Safety Administration (NHTSA) typically conducts an RSA and, based on the findings, use a multidisciplinary approach of enforcement, education, and engineering to make short- and long-term recommendations. Safety corridors carry double fines for certain violations through enacted legislation, and signs marking the section of roadway that read "Safe Corridor" are erected. Half of all fines collected in the safety corridors are deposited into the Highway Safety Fund, with half used for low-cost engineering improvements and half for enforcement efforts. A copy of the New Jersey legislation is included in Appendix B.

All of New Jersey's safety corridors are located in urban areas; therefore, many crash types are exacerbated by congestion and access management problems. Typical engineering countermeasures include improved signal timing and coordination, updated signing and striping, maintenance issues, and pedestrian safety improvements. To measure the effectiveness of a safety corridor, New Jersey uses a crash reduction approach. Fatal, injury, property damage–only (PDO), and total crashes are all analyzed for decreases from previous years. Approximately every three years, the safety corridors are re-analyzed using the same criteria as those used for selection, and if the corridor does not meet those criteria, it may be decommissioned. Otherwise, further efforts and improvements will continue. After the initial 13 safety corridors were implemented, New Jersey saw an approximate 7% drop in both injury and total crashes for these corridors.

2.7. New Mexico

New Mexico's safety corridor program started in 2002 in response to an outcry from communities that truck drivers were using certain routes as shortcuts, making the regular users feel unsafe. After letters were written to the governor from concerned citizens, the governor contacted the New Mexico Department of Transportation for help in developing a comprehensive, multidisciplinary safety program. As a result, a program was developed using mainly extra targeted enforcement and double fines for speeding in the safety corridor area. The mission is accomplished by developing and supporting a comprehensive, multistrategy approach that includes enforcement, deterrence, prevention, media and education, training, legislation and regulation, and data management and analysis. The overall goal is to reduce crashes and fatalities on these segments by at least 20% (NHTSA 2003).

Two pilot programs for each of the six districts in New Mexico began on four- and two-lane rural roadways. Traffic patterns and characteristics are studied regionally, and roadways with the highest crash rates per road mile are analyzed in depth. Statistics of 10 or more injury or fatal crashes per five miles are examined, and the top 10–15 roadways per district are ranked accordingly. A large amount of cooperation is needed from the local jurisdiction, as the money is distributed to local enforcement in the area. Local entities' opinions about when and where improvements are needed is very important to the program. Legislation has been passed making any roadway designated as a safety corridor eligible for doubled fines for speeding, and operation of headlights may be encouraged.

At the end of three years, the crash and fatality data are analyzed, and, if it is decided that a significant reduction is made, the safety corridor may be decommissioned and the next roadway on the list is designated. The six basics of the program are a five-year crash history on a moving five-mile stretch, a crash investigation with a review and recommendations, a review of the engineering and law enforcement initiative so as not to overlap efforts, an approval from the district engineer, a public awareness campaign, and a review of the equipment and signage.

2.8. New York

New York's safety corridor program was identified through a subsequent survey. Traffic Safety Corridor projects in New York are a joint effort between the New York State Department of Transportation's Office of Traffic Safety and Mobility and the New York State Police. However, a safety corridor is primarily considered an enforcement program. Emergency responders and schools have not been involved in the safety corridor program. Prosecutors, judges, and magistrates have not been involved in any specific manner either.

Using law enforcement crash reports and other data, locations with high crash rates are identified throughout the state. Each State Police Troop then schedules focused enforcement in at least two targeted corridors in its respective area. Local law enforcement and media are utilized to saturate the selected areas with enforcement and publicity. The law agencies then follow up with frequent enforcement activities. Major support for these efforts comes from NHTSA Section 402 or 406 funding; citation revenues are not returned for safety corridor enforcement use.

Press conferences are scheduled and the campaign receives media coverage when activities begin, and generally better compliance by drivers is observed initially and during saturated enforcement efforts. New York does not have enabling legislation in place addressing the safety corridor program.

Additional information about New York's safety corridor program is available at http://www.dot.state.ny.us/news/2006/r9/050506.shtml.

2.9. Ohio

Ohio's safety corridor program began in 2004 when the governor charged the Ohio Department of Transportation (Ohio DOT) and the state DPS to form a safety task force to target corridors with abnormally high crash frequencies and crash severity tendencies (Ohio DOT 2004). The program that was developed is discussed here, but due to some negative press and the fact that Ohio already has what it considers rigorous safety-conscious efforts, it is uncertain whether the safety corridor program will continue to function as such. The Governor's Task Force on Ohio Highway Safety was formed with five members from the Ohio DOT (Chief of Staff, Deputy Director of the Planning Division, Office of Safety Administrator, Office of Traffic Engineering Administrator, and Office of Technical Services Administrator) and five members from the DPS (Highway Patrol Information Services Section Commander, Highway Patrol Research Administrator, Field Operations Representative, Licensing and Commercial Standards Representative, and Governor's Highway Safety Office [GHSO] Representative). The task force is in charge of designating and analyzing safety corridors in Ohio.

Safety corridors are identified by analyzing the most recent five-year crash data over approximately two-mile sections of similar roadways using these four statistics:

- Statewide crash rate per million vehicle miles traveled (MVMT)

- Statewide five-year average crash density per mile
- Statewide fatal crash rate per 100 MVMT
- Statewide five-year average fatal crash density per mile

Based on these crash trend analyses, a ranking system is used and the top 5% of roadways are targeted. Once a corridor has been identified, the task force appoints a Safety Corridor Review Team. The team is made up of the corridor's respective Ohio DOT District Deputy Director, District Planning Administrator, Safety Review Team Chair from the Office of Safety, Highway Patrol District Commander, GHSO Representative, and other members as deemed necessary. The responsibilities of the Safety Corridor Review Team include analyzing the corridor from a 4E perspective, soliciting input from residents and local stakeholders, developing and implementing countermeasures, and tracking the effectiveness of the corridor. No set length is necessary for a safety corridor, and 10 corridors were initially considered.

Ohio uses some of the most statistically rigorous MOEs of any state. Once countermeasures have been put in place for some time, a simple before-and-after crash count comparison combined with an empirical Bayesian approach is used to analyze the corridor's countermeasures' effectiveness. Reviewed annually, Ohio decommissions a safety corridor if fatal crash statistics used in selection decrease, causing the roadway to drop below the top 5% statewide.

2.10. Oregon

Oregon, a leader in safety corridors, began its program with two corridors in 1989. A safety corridor is defined as a stretch of state highway with an incidence of fatal and serious injury crashes higher than the statewide average for similar roadways. Using the 4E approach, many safety corridors are used as an intermediate step in more permanent safety infrastructure improvements. The safety corridor program that is developed is also intended to be easily applicable to both state and local highways. The authors of this report visited the Portland District of the Oregon Department of Transportation (ODOT) and met with Mr. K.C. Humphrey, who shared all of his program management information and provided a field tour of an active safety corridor and two decommissioned corridors. The authors also met with Mr. Jerry Sabel, Chair of the Mt. Hood Safety Corridor Citizen Advisory Commission, who explained the role that citizens play in implementing the safety corridor projects. It was clear that his enthusiasm for the corridor sparked much local grassroots support, attracted the attention of local legislators (positive support), assisted ODOT in its implementation efforts, impacted the scheduling of enforcement personnel, assisted in access control limitations, and contributed to the improved safety along the highway. The ODOT engineer remarked that Mr. Sabel was his "secret weapon."

The organizational network of the safety corridor program in the ODOT Traffic Safety Division consists of the safety corridor program manager, the traffic roadway engineering section, the crash analysis and reporting section, and ODOT's five geographic regions (ODOT 2006). The program manager oversees the whole program and its guidelines, assures compliance with the guidelines, analyzes data and makes safety corridor recommendations, gives guidance on countermeasures, and reviews annual safety corridor plans. The traffic roadway engineering section analyzes crash data and gives safety corridor recommendations, includes key players in

the initial designation and decommissioning of a safety corridor, and makes important engineering judgments and analysis decisions. The crash analysis and reporting section provides annual safety corridor data for reports and makes special data runs. The five geographic regions of ODOT have ownership of local safety corridors, coordinate and develop annual safety corridor plans, plan and hold meetings, and are ultimately responsible for all aspects in the 4E approach.

An initial safety corridor designation team is formed from key players in the safety corridor organizational network. The team is comprised of the ODOT safety corridor program manager, the traffic roadway engineering section representative, the regional transportation safety coordinator, the region's traffic engineer, the appropriate district manager, and the region's public information officer. The team may officially designate the section as a safety corridor when it is agreed that the specified roadway section meets three designation criteria:

- The roadway must demonstrate a three-year average fatal plus serious injury crash rate at or above 110% of the latest statewide three-year average for similar roadways.
- The state and/or local law enforcement will commit to making the corridor a patrol priority.
- The initial designation team agrees that the length of roadway is manageable from an enforcement and education standpoint. Rural sections may be longer than urban sections.

Once the initial designation team determines that the corridor meets the criteria, it is up to the region's key players to identify stakeholders, review the safety corridor crash data summary and recommendations report in detail to identify problems and possible countermeasures, and develop and share with the stakeholders an annual safety corridor plan report. This safety corridor report should include an updated stakeholder list, data elements to be tracked, activities planned for the safety corridor during the year, the parties responsible for each action and corresponding timelines, funding resources and amounts, and identification of projects scheduled within the safety corridor. An annual commitment from participating enforcement agencies, a minimum of four quarterly public information efforts, an annual review of traffic control devices, and a coordinated effort to identify and develop cooperation between emergency medical services (EMS) agencies within the safety corridor area must all be included in the safety corridor plan report.

Improvements made to the corridor will be determined, sometimes with an RSA performed by a multidisciplinary team, to determine short-term countermeasures and low-cost projects with minor engineering repairs and upgrades. Planned enforcement efforts targeting risky driving behaviors, timed educational events or campaigns, and EMS enhancements are all important aspects of the safety corridor plan. Safety corridors are always identified with special signs and are usually accompanied with doubled traffic fines. In most cases, there will be additional signing asking the drivers to turn on their lights for safety.

The decommissioning process is handled by the initial designation team and is considered if any one of the following criteria is met:

- The three-year average fatal plus serious injury crash rate is at or below 100% compared to the three-year average for similar roadways.
- Any of the remaining designation criteria are not met.
- Minimum requirements within safety corridor program guidelines are not being performed.
- A continued lack of activity or investment in the safety corridor.

However, a local stakeholder group may "adopt" the safety corridor once it is decommissioned, assuming that the group provides meaningful local investment into improving the safety of the roadway.

Additional information about Oregon's safety corridor program is available at http://www.oregon.gov/ODOT/TS/docs/Safety_Corridor_Guide_2002.pdf.

2.11. Pennsylvania

The first known safety corridor was established in Pennsylvania in 1988 in response to a high number of fatal crashes along a particular highway. In 1990, the FHWA conducted a workshop on safety corridors, and this technique was voted the most promising short-term crash countermeasure.

Pennsylvania defines a safety corridor as a section of a highway where double fines are in effect for certain traffic violations. The corridor is marked by signs that clearly inform the motorist of the designation. The Pennsylvania Department of Transportation (PennDOT) is required to perform a traffic engineering investigation to determine whether a location can be called a highway safety corridor. Legislation went into effect in 2003 that allows double fines to be collected in highway work zones as well as officially designated safety corridors. Double fines are applied for certain traffic violations, such as speeding, reckless driving, and tailgating.

A study on six pilot locations was completed in August 2006 in which signs were posted that read "Safety Corridor – Fines Doubled." Additional traffic enforcement was provided by police as well as coordination with district justices and a public education component. The study found that incidences of speeding were reduced by 2%–14% in the safety corridor pilot locations during a six-month period following the initiative. The largest reductions in speeding took place in the right lane, where enforcement was the most visible. Participation of the local enforcement community is critical, as it is believed that warning signs do not change motorist behavior on their own. Each PennDOT district office can choose suitable locations for designated highway safety corridors. Although enforcement may be the primary objective, engineering solutions and education campaigns are utilized when necessary. For example, two locations are currently being designated in District 6 (Philadelphia and suburban regions) and are equipped with all aspects of the safety corridor designation.

2.12. Virginia

A pilot program was initiated in both rural and urban areas in 1992, but, following a strong start, the program did not achieve the desired results due to many factors, including a long time period required to select corridors and identify countermeasures, an overly large team size, and a lack of adequate funding support.

In 2003, legislation was passed to formally develop a highway safety corridor program on the condition that at least one corridor be deployed by the beginning of 2004. Due to time constraints, the safety corridor program was only developed and implemented for the Interstate System. However, a methodology for transferring the initial program to the primary highway system was discussed. Interstates were the easiest to define and develop a program for due to their relatively homogenous nature.

In developing the safety corridor program, Virginia was split into three regions with similar traffic patterns, geometrics, and topography characteristics to compare similar roadways. Variable lengths of 5, 10, and 15 miles at 0.1-mile intervals were initially used in analyzing crash data. Ultimately, a five- mile length was chosen. It was determined that the minimum length of a corridor would be five miles, with a maximum length determined by what could be enforced effectively and efficiently.

Selection criteria are as follows:

- The crash rate must exceed 125% of the regional average (approximately one standard deviation above average crash rate).
- The equivalent property damage only (EPDO) crash frequency must exceed 150% of the regional average on a per-mile basis (PDO=1, injury=8, fatal=20).
- The truck-involved crash rate must exceed the overall regional rate.

The rate and EPDO frequency are then normalized by dividing by the maximum rate or EPDO in the region, and then the measures are added to rank and establish priority for implementation. From the crash evaluation, Virginia implemented three safety corridors, one in each region.

A media campaign was also organized to gain recognition among travelers in the three implemented safety corridors. Posters, direct mail flyers, billboards, bus placards, and radio public service announcements were incorporated into the safety corridor program.

Once the three selected corridors were implemented, the measures of effectiveness used were generally speed reductions for two of the sites and an empirical Bayesian crash reduction analysis for the third. Before-and-after speed reductions for mean speeds, percent of vehicles traveling greater than 15 mph over the speed limit, and the percentage of vehicles compliant with the speed limit were all considered in these safety corridors.

Speeding citations in the corridors could result in a $500 fine, and reckless driving or impaired driving could result in a maximum fine of $2,500. Open container penalty transfer funds could be used for enhanced enforcement.

Reports and papers describing the safety corridor program in Virginia have been prepared by Michael Fontaine and Stephen Read. For more information, refer to a paper entitled "Evaluation of Highway Safety Corridors" (Fontaine and Read 2006). Additional information about Virginia's safety corridor program is available at http://www.virginiadot.org/comtravel/ct-highway-safety-corridor.asp.

2.13. Washington

Washington State's safety corridor program is headed by the Washington State Department of Transportation (WSDOT) and the Washington Traffic Safety Commission (Governor's Highway Safety Program Office) closely cooperating with local agency groups. The Washington State Patrol is also a key player. If the corridor is a state highway, the Traffic Operations section in the WSDOT's field district office is the lead. However, if the corridor is on a city street or county road, then the Highways and Local Programs officer in the district office becomes involved. Being affiliated with the Washington State Local Technical Assistance Program (LTAP) provides these staff easy access to the local agencies. A statewide program manager acts as a champion for the safety corridors program and facilitates the local programs. Typically, a city official becomes the safety corridor's team leader, as these programs are typically locally led and coordinated. Typical projects last 18 to 24 months.

Washington uses a 4E approach to the corridors, which have no set maximum or minimum length, although 2 to 25 miles is typical. Approximately —four to six safety corridor projects are operating at one time. Safety corridors range from a suburban five-lane arterial to a rural 55 mph two-lane roadway. The criteria for selecting safety corridors include crash history, including severity of crashes. Other non-exact factors are also used to select a corridor. Local support for a corridor project is also an important factor in selection. Once a corridor is designated, selected stakeholders go to the site and identify safety concerns, including where and what type of collisions are occurring. The safety corridor team meets about two or three times to identify and implement solutions. Efforts to address crashes are typically low-cost engineering solutions, such as rumble strips and restriping, implemented by the local authority. The Traffic Safety Commission–administered Section 402 funds are made available for the locals to establish education programs as well as for increased and targeted enforcement efforts. There is no legislation for double fines. In efforts to heighten the awareness of prosecutors, defense attorneys, and judges in safety corridor violations, enforcement officers will stamp the ticket with a red stamp that reads "Traffic Safety Corridor" (Figure 2) to indicate that the offense was committed in a high-crash safety corridor.

Figure 2. Washington safety corridor stamp

A large kickoff event, with local publicity and local dignitaries present, is used to notify the public of the safety corridor and the efforts to make the roadway safer. The authors of this report visited safety corridor projects in southwestern Washington and participated in one of the Vancouver safety corridor quarterly team meetings. The authors observed that the wide diversity on the team (enforcement, community groups, school system, public works, EMS, etc.) introduced diverse perspectives and solutions in an environment where everyone was cooperative and supportive. Everyone had a stake in the outcome. Pedestrian accommodation along the corridor (especially crossing the arterial in commercial areas) was one instance where very productive and supportive communications were observed. The outcomes involved several items, including local enforcement focus, special signage, shopping center–based communications, access limitations, and pedestrian signal coordination, along with a schedule for implementation and a funding plan. Evaluation was also discussed, but no agreement was reached at this meeting.

An arbitrary time period for safety corridor designation is established by the WSDOT and Washington Traffic Safety Commission, usually one and a half to two years. Once the WSDOT believes that the driver behaviors have changed and the roadway is safer because of the safety corridor efforts, the project will be deemed as "completed." The corridor will then be decommissioned and the safety corridor signage will be removed.

Washington has completed approximately 23 safety corridor projects, and 7 projects are currently active. Results have been very good, with decreases observed in the number of reported collisions (5%), injuries (11%), alcohol-related crashes (15%), and fatal/major injury crashes (34%). A cost-benefit ratio of approximately 35:1 has been noted.

Additional information about Washington's safety corridor program is available at http://www.wsdot.wa.gov/TA/ProgMgt/Grants/Intersection_Corridor.htm.

3. EXAMPLES AND RESULTS OF SUCCESSFUL IMPLEMENTED SAFETY CORRIDORS

The safety corridor concept is relatively new to the field of traffic engineering. While many DOTs in the past have continuously focused on highway safety through separate programs, many are not multidisciplinary, lacking a 3E or 4E approach to safety. Due to the relative newness of the concept, most states that have implemented safety corridor efforts do not have significant amounts of data to perform thorough analyses. As an effect of this, comprehensive evaluations of safety corridors were found to be limited. The following is a presentation of specific safety corridor programs in selected states and their effects on improving highway safety. A combination of rural and urban corridors is described to encompass the broadly ranging solutions to identified crash safety concerns.

3.1. Alaska's Seward Highway Safety Corridor

The Seward Highway Safety Corridor, the first implemented safety corridor in Alaska, is a 27-mile stretch of rural two-lane interstate with posted speed limits of 65 mph and 55 mph (Alaska DOT&PF 2006). Functioning mainly as a commuter and recreational route, daily volumes continuously approach 22,000 vehicles on weekends during the summer months, more than double the annual average daily traffic (AADT). Overrepresented types of crashes include improper lane changing and driver inattention problems, fatal accidents occurring during twilight hours, and non-restrained fatalities. Over 50% of the fatal crashes on this section of Seward Highway were head-on collisions. A study of the highway conditions concluded that the geometrics of the roadway itself were not a major contributing factor. However, increased summer traffic volumes, winter driving conditions, and a diverse mix of roadway users, combined with a lack of passing opportunities or slow vehicle turnouts, may have contributed to the poor driver behavior due to frustration and a higher incidence of head-on type crashes.

Implemented engineering countermeasures on the Seward Highway Safety Corridor include continuous edge line rumble strips, periodic centerline rumble strips on horizontal curves, additional speed limit signs and high-level warning devices on all existing speed limit signs, installation of regulatory and pennant "Do Not Pass" signs in areas striped for no passing, and creation of additional no passing zones previously not present. Additional targeted enforcement was implemented along the corridor to support the double fines legislation of the corridor. Educational implementations have included changeable message signs informing drivers of extra enforcement, speed radar trailers, the "It's Still Winter, Chill Out on the Road" winter safe driving campaign and the "Click it or Ticket" and drunk driving media campaigns, and a memorial highway sign program to place signs at locations of fatal crashes.

As of early April 2007, the safety corridor review team had concluded that safety corridors have reduced severe crashes in the short term. Severe and fatal crashes have been reduced by more than half on the Seward Highway. However, more resources are needed to further prevent and reduce crashes. One fatal collision occurred in the 10 months since implementation, which was a random crash involving a loose tire falling off a vehicle and striking a motorcyclist. There were no severe injury collisions within the designated corridor. The crash rate before the safety

corridor implementation was 13.10 per 100 million vehicle miles (MVM), while after the safety period the figure dropped to 1.22 per 100 MVM. Due to the short duration since implementation, it is too soon to determine if this trend will continue.

3.2. California's State Route 41/46 Safety Corridor

State Routes (SR) 41 and 46 are largely rural two-lane routes that run east-west and eventually merge to connect two main north-south routes, US 101 and Interstate 5 (California Highway Patrol 2001). SR 46, infamously known as the roadway where James Dean was killed in the late 1950s, maintained notoriety into the 1990s for its frequency of fatal and injury collisions. Four years of crash data (1992–1995) for the two routes showed 981 total collisions, 31 of which were fatal crashes and 399 of which were injury crashes. Data indicated that the majority of crashes occurred between 1:00 pm and 6:00 pm on Fridays, Saturdays, and Sundays. AADT rates were approximately 14,000 vehicles. An assessment by the safety task force concluded that the major contributing factors to the collisions were drifting out of the lane, overcorrecting off the road, crossing the centerline, poor signage, inadequate shoulders, short merging and passing lanes, poor accessibility and response times for EMS workers due to the remoteness of the roadway, and a misunderstanding of signs and laws relating to the use of occupant restraints and drinking and driving by a large Spanish-speaking worker population traveling the roadway.

Overtime enforcement efforts were cooperatively shared by three CHP commands and two local police departments to target the most frequent causes of collisions. Officers worked 2,922 overtime hours, assisted motorists 2,837 times, and issued 14,606 citations. Emergency response services were improved along the corridor by installing emergency roadside call boxes throughout, approving funds for several county and city fire departments to purchase the equipment used by emergency responders at traffic collisions, agreements between EMS providers that the closest units would respond to an incident regardless of jurisdictional boundaries, and the permanent assigning of a CHP helicopter to the CHP Coastal Division to be specifically utilized for the safety corridor. The following were among the notable engineering implementations:

- Raised-profile thermoplastic striping were installed where passing was only allowed in one direction.
- Centerline rumble strips were installed in no-passing zones.
- Shoulders were treated with rumble strips and indented-profile thermoplastic striping.
- Certain lane drops were reconfigured to keep merging consistent.
- "Stop Ahead" warning signs and chevrons were installed at certain key intersections and curves.
- Signs were posted declaring the corridor as a daylight headlight safety section.
- Double fines were legislated in the safety corridor, and signs were placed to inform motorists of the double fines.

A variety of education campaigns and materials were employed, including two million flyers emphasizing safe driving behaviors and posters in restaurants, recreational destinations, and local businesses. Additionally, local restaurants offered free coffee or soft drinks to customers who

mentioned the safety corridor, Spanish-language television and radio public service announcements (PSAs) were broadcast each weekend, and three kickoff news conferences were held simultaneously at three separate locations along the corridor.

Four years of "after" data (1997–2000) compared to four years of "before" data (1992–1995) show a 35.4% decrease in fatalities, a 26.5% decrease in severe injuries, and a 5.2% decrease in total injuries. An evaluation of fatal plus injury crashes over the same time period for targeted crash types showed a 15.4% decrease in unsafe turning, a 35.0% decrease in improper passing, and a 13.5% decrease in DUI fatal plus injury crashes.

3.3. Pennsylvania's Roosevelt Boulevard Safety Corridor

One author of this report, Derek Vap, made a site visit to an urban safety corridor in Philadelphia while on a safety scan tour with one of the sponsors of this synthesis, MoDOT. Experiencing first-hand the complications that led to the implementation of a safety corridor in a large urban area provided for a better understanding of the different strategies that a task force must use in an urban setting compared to a rural setting. Figure 3 shows one direction of travel after the implementation of safety measures, including pedestrian safety enhancements.

Figure 3. Driver's view of Roosevelt Boulevard Safety Corridor

A spike in pedestrian fatalities on two of the "most dangerous intersections" in the nation led to the development of the Roosevelt Boulevard Task Force (Anderson 2007). A Delaware Valley Regional Planning Commission study was performed to inform the Roosevelt Boulevard Task Force of solutions that may be effective in this corridor. The corridor is an urban section approximately 8 miles in length with over 180,000 people living within one half mile of the boulevard. The roadway has an AADT of approximately 80,000 vehicles. From 2001–2005, 133 pedestrian crashes occurred, resulting in 13 fatalities. Roosevelt Boulevard is a 12-lane facility, with 6 local and 6 express lanes serving both local and regional traffic. The road includes 11 mid-block pedestrian crosswalks and 40 traffic signals within the study area (Vap et al. 2007).

Roosevelt Boulevard was designated a safety corridor, and improvements were initiated to reduce pedestrian crashes, rear-end crashes, and red light running incidents. Improvements were numerous, including the following:

- Roadway redesign
- Signal timing adjustments and coordination
- Speed limit reduction and speed display signs
- Public education
- Increased enforcement, including photo enforcement of red light running
- Legislation changes
- Pedestrian countdown signals
- Posted pedestrian crossing information
- Improved crosswalk demarcation
- Signalized mid-block crosswalks
- Police/emergency pull-off areas

These are multiple strategies to address safety concerns in many urban scenarios. It has been found that a driving concern in the selection of many urban safety corridors is pedestrians. Due to the recent implementation of this safety corridor, there are limited results. It should be noted that the immense amount of congestion in this corridor and the safety concerns may only experience significant reductions when major improvements are made. The safety corridor in this situation is mainly a temporary solution until further, more extensive improvements can be made. However, public perception is positive, and drivers seem to be more cautious. Since the installation of red light running cameras, one intersection has seen a two-thirds decrease in violations, from 1,500 violations per month to 500.

3.4. Virginia's Interstate 81 Safety Corridor

The Interstate 81 Safety Corridor is a 15-mile rural/suburban section located near the Roanoke metropolitan area in mountainous terrain (Fontaine and Read 2007). Posted speed limits are 65 mph at the southern end of the corridor and 60 mph at the northern end. There is no significant congestion, and vehicles are usually able to travel at free-flow speeds.

Engineering countermeasures included the following: shoulder rumble strips were installed in isolated sections where they had previously been missing, acceleration and deceleration lanes were extended at four interchanges, six-inch tape markings and raised pavement markers were installed, highway advisory radio was installed throughout the area, and variable message signs were installed on intersecting roadways prior to ramps and on the mainline. Signs alerting drivers of the safety corridor were installed at the beginning, end, and periodically throughout the corridor, as shown in Figure 4.

Figure 4. Virginia Safety Corridor sign

Educational initiatives included posters, direct mail flyers, bus placards, radio PSAa, and billboards within the corridor area. Approximately $250,000 has been spent annually on educational efforts using NHTSA grants since the safety corridor program began. Increased enforcement was largely performed using existing Virginia State Patrol resources, along with safety grants obtained through the Virginia Department of Motor Vehicles. A total of 1,467 citations were written in 2005 on the corridor, 78.3% of which were cited for speeding.

Results have shown that, after the second year of installation, the I-81 safety corridor has reduced total crashes by about 28% and fatal/injury crashes by 44% versus what would have been expected based on the crash trends at comparison sites. These crash results were statistically significant. A telephone survey was conducted of residents in the entire Virginia Department of Transportation region that included the I-81 Safety Corridor. Approximately 52% of drivers surveyed were aware of the safety corridor.

3.5. Washington's State Route 14 Safety Corridor

The author made a field visit to Washington and Oregon to talk more in depth with the state DOTs as well as the City of Vancouver, Washington. Researchers drove through several safety corridors and attended a City of Vancouver monthly safety meeting with multidisciplinary stakeholders to get the local perspective in the process. The following is an example of a successful corridor that was completed and decommissioned over one year ago.

The State Route (SR) 14 Safety Corridor is a 15-mile two-lane rural road that follows along the winding Columbia River Gorge in southwest Washington (Figure 5). The top three collision causes were determined to be exceeding safe speeds, crossing the centerline, and driving under the influence of alcohol. The leading collision types were hitting fixed objects, hitting wildlife, and vehicle overturns. Engineering countermeasures used included installing centerline rumble strips throughout the entire corridor, marking the road with corridor signs, updating signs along the corridor, improving pedestrian warning information for drivers at a nearby state park, conducting a speed study in the corridor, and installing road condition warning signs using the highway advisory radio system. Education efforts included a project kickoff media campaign, a "Designate A Driver" holiday campaign at local bars and restaurants, "Heed the Speed on Hwy. 14" signs, public awareness messages on the back of trucks that travel on SR 14, commercial

vehicle educational materials and air fresheners handed out at weigh stations, and a project wrap-up and celebration.

Using enforcement that targeted excessive speeding, following too closely, improper passing, and DUI, the Washington State Patrol with the county sheriff's office reported a 55% increase in DUI arrests, a 103% increase in speeding contacts, a 158% increase in total contacts, and a 110% increase in traffic warnings. The project lasted for two years, and a 65% decrease in fatal and disabling injury crashes was observed on SR 14 compared to three years prior to implementation (May 13, 2000 to May 13, 2003 versus May 13, 2004 to May 13, 2006). Total collisions decreased by 19%; alcohol-related collisions were down 57%; the number one cause of crashes, excessive speeding, decreased 37%; and the number one collision type, hitting fixed objects, was down by 17%.

Figure 5. Washington's SR 14 Safety Corridor

4. CONCLUSIONS AND RECOMMENDATIONS

Most safety corridor programs across the United States are similar, but no single program will fit every state's needs. Roadway and crash characteristics, as well as the availability of safety funds, differ from state to state. Each state DOT must decide which aspects of the safety corridor process will effectively and efficiently accommodate its organization's needs. A multidisciplinary 4E effort has proven to be an effective solution to improving a roadway's safety. Sharing and dissemination of information between states is an integral part of the U.S. goal of reducing traffic fatalities. This synthesis encompasses the current state of the practice in safety corridor programs across the U.S. and provides characteristics of these successful safety corridors that states can use when addressing sections of a highway system with higher crash histories. Table 1 lists the characteristics of successful programs by state. Each characteristic of the safety corridor programs is discussed in more detail below.

Table 1. Characteristics of successful safety corridors, by state

State	Characteristic Observed												
	1. Multidisciplinary	2. Limited Number	3. Crash Data	4. Champion	5. Safety Action Plan	6. Legislation	7. Special Signage	8. Road Safety Audits	9. Minimal Engineering	10. Length	11. Decommissioning	12. Selection Criteria/MOEs	13. "After" Data
Alaska	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓	✓
California	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓
Florida	✓		✓	✓					✓	✓		✓	✓
Kentucky	✓	✓	✓				✓	✓	✓			✓	✓
Minnesota	✓						✓	✓	✓	✓			
New Jersey	✓	✓	✓	✓		✓	✓	✓			✓	✓	✓
New Mexico	✓	✓	✓	✓		✓	✓		✓	✓	✓	✓	✓
New York	✓	✓	✓	✓	✓					✓		✓	
Ohio	✓	✓	✓				✓		✓	✓	✓	✓	✓
Oregon	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Pennsylvania	✓		✓			✓	✓		✓	✓		✓	✓
Virginia	✓	✓	✓			✓	✓		✓	✓		✓	✓
Washington	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓

4.1. Safety Corridor Program Characteristics and Recommendations

Based on the results of the synthesis, the following list summarizes the characteristics, good practices, and other items found in safety corridor programs across the U.S.:

4.1.1. Multidisciplinary

Most states agreed that there was not a single cause for the higher crash frequencies along particular stretches of highway and consequently believed that a group of solutions needed to be considered. This called for a broad-based approach to both problem identification and countermeasure selection. The task force teams were most often led by the state DOTs. California's efforts were led by the Highway Patrol, and Washington's efforts were many times headed by the local jurisdiction. Regional planning organizations were shown to be important members with special skills in bringing together disparate groups. In addition to representatives from education, enforcement, engineering, and emergency responders, consideration should be given to inviting traffic court prosecutors and judges to serve on the safety corridor team.

Consensus and Recommendations: A multidisciplinary approach should be used; most states also included emergency medical providers, which represent the fourth "E" in the 4E approach.

4.1.2. Limited Number

In general, successful states limited the number of active corridors at one time because they believed that too many would result in a lack of focus and effectiveness. Drivers may become desensitized to the effect of safety corridors if too many are implemented. The range of active safety corridors per state was from 3 to 12 at one time. Several states started with one or two pilot corridors, while some states selected one per DOT district.

Consensus and Recommendations: Limit the number of active corridors at one time; too many become ineffective. Pilot corridors should be developed first.

4.1.3. Crash Data

The use of crash and fatal/injury data was common among all states in the safety corridor selection process. Some states simply used a crash frequency number or a crash rate, while others used a combination of frequency and rate for preliminary selection of corridors. A crash rate that was 10% greater than the statewide average for similar roadways was found to be a common statistic. Once the preliminary group of corridor candidates was determined, the states typically used some type of ranking process dependent upon location, volume, severity of crashes, etc. The top three to five corridors were then selected for a safety corridor program, usually starting with one or two pilot corridors. The same data used for selection of a corridor should also be used after implementation of safety measures in performance analysis to ensure consistency.

Consensus and Recommendations: Crash and death/injury data, including rates, should be consistently used for selection, evaluation, and decommissioning.

4.1.4. Champion

Many successful programs were supported by one "figurehead" or spokesperson. This person, usually working in the state DOT headquarters, was a constant champion for the safety corridor program. The champion acted on behalf of the local safety corridor task forces to provide lines of communication between the state DOT and all of the stakeholders involved. This person was often an informational source about the corridor process as well as someone to provide suggestions to the task force for sources of possible funding.

Consensus and Recommendations: A statewide champion encourages the success of a program by guiding the selection of corridor, maintaining uniformity in the program, and identifying and distributing available funding.

4.1.5. Safety Action Plan

A comprehensive plan developed by the multidisciplinary task force was important in the safety corridor process. The task force should begin drafting a Safety Action Plan (SAP) at the first meeting, outlining the ideas and steps needed to successfully implement and manage the safety corridor. In this plan, the corridor's safety problems, crash history, and 4E mitigation strategies for the duration of the project should be documented. The engineering, education, enforcement, and EMS activities should all be outlined step by step in the SAP before the safety corridor is initiated. Throughout the process, the task force should meet regularly (quarterly) to update the SAP, discuss the results achieved, and develop any new strategies needed.

Consensus and Recommendations: A multidisciplinary corridor SAP should be developed by a task force that meets regularly for continual review and monitoring of the plan and strategies.

4.1.6. Legislation

Safety corridor legislation was enacted in about half of the surveyed states to establish the corridor program and impose enhanced fines for traffic-related offenses. Some states found it difficult to pass such legislation, while others had positive political support. One state innovatively attached the safety corridor legislation to legislation for double fines in work zones. Legislation gives tremendous support for overtime and targeted enforcement efforts.

Consensus and Recommendations: Legislation can be valuable to establish corridor criteria and permit increased fines. This can be important in the success of the enforcement effort and driver performance.

4.1.7. Special Signing

Signs designed specifically for safety corridors were often used among the states. Depending on the sign purpose, some states used black on white regulatory signs to designate the beginning of a safety corridor, some used black on yellow warning signs, while others used white on green informational signs. Supplemental safety corridor placards were sometimes added to speed limit signs throughout the corridor as well. The signs need to be easily identifiable and serve a purpose within the safety corridor by both advising and warning drivers of the extra emphasis on safety in that roadway section..

Consensus and Recommendations: Special signing in safety corridors should be used. “Safety Corridor – Fines Doubled,” “Enhanced Speed Limits,” and “Lights on for Safety” are typical messages.

4.1.8. Road Safety Audits

For the last several years, the FHWA and many state DOTs have adopted and promoted a multidisciplinary, team-based safety assessment process, RSAs, as a means of improving the practices/procedures/standards relative to the safety of newly constructed highways and existing facilities. Detailed guidelines for conducting these audits have been developed (FHWA 2006). States with successful safety corridor programs believe some type of safety review should be conducted initially on the selected corridors. Many suggested the RSA approach as one that is well established and appropriate for safety corridors. A typical RSA process can be found in Appendix E.

Consensus and Recommendations: An RSA or another type of detailed, multidisciplinary safety review should be conducted initially on the selected corridors to ensure a comprehensive and potentially successful effort.

4.1.9. Low-cost Engineering

Most states typically focused primarily on education and enforcement efforts, with minimal actual engineering improvements. Safety corridors were sometimes used as temporary measures for improving safety when a larger engineering improvement was planned in the future (generally 3–10 years). Any engineering improvements were based on specific crash types and trends observed in the corridor. A focus on driver behavior through educational information and enforcement presence was most important for the safety corridors identified in this synthesis.

Consensus and Recommendations: In general, safety corridor strategies include only low-cost engineering improvements, such as signing upgrades, center line and edge line rumble stripes/strips, and similar measures. However, these improvements can be valuable in reducing common crash causes such as run-off-road crashes.

4.1.10. Length

The length of a safety corridor varied widely from state to state. Some states preferred a length of 3–20 miles, while Kentucky extended its corridors across multiple counties and had corridors that exceeded 50 miles. The constant in successful programs was that the corridor had similar roadway and driver characteristics throughout. Corridor length can have positive and negative aspects: shorter corridors are easier to enforce, while longer corridors attract a wider distribution of road users' awareness.

Consensus and Recommendations: No subjectively determined safety corridor lengths should be specifically set, but selected sections should have homogenous characteristics throughout.

4.1.11. Decommissioning

Most states had some type of decommissioning process incorporated into the safety corridor program. Decommissioning is used to avoid desensitizing road users to the safety practices employed. Decommissioning should take place after safety measures have been shown to improve and should use the same criteria that were employed in the selection and evaluation process. A good goal might be an improvement in safety over two to three consecutive years following implementation.

Consensus and Recommendations: Decommissioning is important after an improved safety measure is achieved, as applied funds can then be applied to other corridors where the need is greater.

4.1.12. Selection Criteria and Measures of Effectiveness

Most states' selection criteria and MOEs were typically not very statistically rigorous. As mentioned above, simple crash rates or frequencies were generally calculated and ranked fairly simply. A few states used a more detailed method that included many factors for ranking high-crash corridors. Whatever method chosen, the criteria should be able to meet statistical tests.

Consensus and Recommendations: Selection criteria and analysis of MOEs should be statistically rigorous to assure effective and data-supported results.

4.1.13. "Before" and "After" Data

Due to the newness of some states' safety corridor programs, detailed analyses were difficult to identify. "Before" and "after" data are important for determining the success of a safety corridor so the program can constantly improve safety. Statistical analysis of data after implementation was limited in many states, and simple crash frequencies and rates and speed distributions were examined. However, for statistically valid data at least three to five years of "after" data is needed in most instances. The drivers' response to the safety corridor activities is also important to achieve the desired results of improved performance and reduced crash rates.

Consensus and Recommendations: Most states have limited "after" data and considered such factors as number of crashes, injuries, speeds, and similar measures. Comprehensive "before" and "after" data, as well as driver reaction, are all important in the success of a safety corridor.

4.2. Other Issues

4.2.1. Pedestrians

Pedestrian issues are very important in the more urban safety corridors, and in two of the corridors the researchers observed this was a primary issue/problem.

4.2.2. Miscellaneous

Several items pertaining to safety corridors that may be of interest include the following:

- The Vancouver, Washington, police officers place a red "Safety Corridor" stamp on their tickets so that prosecutors and judges recognize that the violation occurred in an area where there is a safety problem/focus.
- Kentucky initiated a special program for high schools along the safety corridor.
- Motorcycle police enforcement is prevalent in some urban safety corridors.
- Washington used safety corridor placards or bumper stickers on the back of large trucks traveling through the corridor to further enhance the designation awareness.

4.3. Supplemental Information

In June 2008, the states with known safety corridor programs were contacted again to gather additional data, either through a survey form or through personal contact.

The states' responses to this survey are summarized under the survey questions below. The complete responses are on file in the CTRE office.

4.3.1. Which agency has the major responsibility for and manages the safety corridor program?

In most states, the DOT has assumed major responsibility for the establishment of safety corridors and related activities. However, in many states the Governor's Traffic Safety Office and law enforcement are also involved. In California, the CHP is the responsible agency.

4.3.2. What are the major funding sources for operation of the safety corridor?

Funding sources vary among the states. Roadway improvements are generally funded through federal programs, such as the HSIP, or state funds. For enforcement and education efforts, NHTSA funding, either Section 402 or 406, is common. Even relatively small levels of funding

can be valuable as “seed” funds or ways to leverage other funding opportunities. A reliable source of funding is very important for the administration of a successful safety corridor program.

4.3.3. Are citation revenues used for a specific purpose related to safety corridors?

Almost all states responded negatively to this question, but Alaska legislation allows these revenues to be to be used to continue policing programs. New Jersey also uses citation revenue for low-cost engineering improvements and enforcement efforts.

4.3.4. Has public reaction to safety corridors been positive, negative, or ambivalent and, if negative, how was that addressed?

Most states have experienced no negative public reaction to safety corridors, but no significant positive reaction either. In California, when some concern was raised by certain advocacy groups, special efforts to include these groups in the planning process were undertaken and extra communication was used to build consensus. Kentucky and Washington indicated a positive public reaction to safety corridors.

4.3.5. Were or are emergency responders included in the planning or managing of the safety corridors or were any special accommodations included for EMS in the program?

Involvement of emergency responders in safety corridor programs varies widely among the states. Some states do not include EMS at all, while EMS representatives are active members of safety corridor teams in Alaska, California, Kentucky, and Washington.

4.3.6. Has reaction to safety corridor citations by judges, magistrates, and prosecutors been supportive, negative, or ambivalent?

Most states have not experienced much specific reaction from these groups, but not much support either. California has invited representatives from prosecutorial groups and judges to serve as safety corridor task force members. Virginia reported a good overall reaction, and Pennsylvania has undertaken an outreach program to district judges that has yielded positive results. The use of an advisory stamp on safety corridor citations in Washington has seemingly resulted in a positive response from judges.

4.3.7. Has there been any involvement by schools and/or news media in the safety corridor program? If yes, please explain.

The news media has proven a valuable asset in many safety corridor programs, sometimes by creating awareness of the need for attention to safety concerns. No state reported negative media coverage. Kentucky and Virginia advised outreach programs for schools. Washington has experienced considerable involvement by schools in the safety corridor efforts. News media coverage has also been good in Washington.

4.3.8. Were any specific Federal DOT resources applied to the safety corridor program?

The states generally reported the use of funding from federal programs such as HSIP for engineering improvements and used NHTSA funding for enforcement and educational efforts. No other federal programs were mentioned.

4.3.9. Law Enforcement Information

1. Are both state and local law enforcement agencies involved?

   Most states reported that both state and local enforcement agencies are involved in safety corridor activities. In California, apparently the State Patrol contributes all uniformed officers for enforcement and outreach efforts.

2. Were more citations issued following designation of safety corridors?

   Responses were mixed for this question. Some states experienced an increase, others did not, and some did not specifically track the data.

3. Are citation revenues used to offset additional enforcement costs?

   All responding states replied negatively to this question except Alaska and New Jersey, where these revenues can be used for enforcement and low-cost engineering, respectively.

4. If special enforcement efforts were applied, such as overtime or increased surveillance, how are the additional costs handled?

   No special funding sources were reported. Section 402 funding and agency budgets were applied as needed.

5. Was improved driver performance and/or reduced crashes observed following designation of safety corridors?

   All states reported improvement in driver performance, as evidenced by decreased crash levels. However, performance could sometimes be observed returning to pre–safety corridor levels later and during periods of more normal enforcement efforts.

4.3.10. Was enabling legislation enacted for the establishment of safety corridors?

States were split on this issue, most did have some form of enabling legislation in place, but many did not. Copies and descriptions of some legislation are included in Appendix B of this report.

4.4. Summary

Successful safety corridors can be established and administered by following these recommended steps:

- Select corridors based on a significantly high crash history.
- Decide on the appropriate composition of the task group.
- Identify the important decision makers.
- Generate public support through media as much as possible.
- Select countermeasures on a multidisciplinary basis.
- Secure funding for an ongoing program.
- Evaluate and publish beneficial impacts.

Safety corridors can generally provide positive results by improving safety and driver performance in selected roadway sections, particularly when coordinated with local safety professionals and with an emphasis on public awareness. Safety corridors are an excellent tool to demonstrate responsiveness to public demands and the identified safety concerns at a relatively low investment cost. Safety corridors can provide a procedure for implementing selected countermeasures relatively quickly while longer term, more costly solutions are being developed and funded.

Through this research and conversations with engineers at state DOTs, it was a common opinion that a review of all safety corridor programs in the nation had not been conducted until this synthesis. It is hoped that this study will be valuable for disseminating best practices and successful results. Safety corridor programs across the nation are similar but not identical, and a reliable reference is needed when establishing a new program. These best practices may also be used for updating existing safety corridor programs to achieve the full benefits from applied resources and efforts.

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APPENDIX A. SAFETY CORRIDOR CONTACTS

State	Safety Corridor Contact Name (Agency)
Alaska	Scott Thomas (Alaska DOT&PF) Al Fletcher, (FHWA, Alaska Division)
California	Ophelia Torpey (California Highway Patrol) Ken Kochevar (FHWA, California Division)
Florida	Peter Hsu (Florida DOT) Hussein Sharifpour, (FHWA, Florida Division)
Kentucky	Boyd Sigler (Kentucky Transportation Cabinet) Ryan Tenges, (FHWA, (Kentucky Division)
Minnesota	Sue Groth (Minnesota DOT) Dave Engstrom (Minnesota DOT) Dave Kopacz (FHWA, Minnesota Division) Robert Bollenbeck, (Safe Communities Coalition Virginia Lockman, (Safe Communities Coordinator))
New Jersey	Kevin Conover (New Jersey DOT) Karen Yunk (FHWA, New Jersey Division) Wilbur Dixon, (NJDOT)
New Mexico	Mike Quintana (New Mexico DOT) Alan Ho (FHWA, New Mexico Division)
New York	Barbara O'Rourke (New York DOT) Jim Growney (FHWA, New York Division)
Ohio	Michelle May (Ohio DOT) Joe Glinski (FHWA, Ohio Division)
Oregon	Anne Holder (Oregon DOT) KC Humphrey (Oregon DOT, Region 1) Nick Fortey (FHWA, Oregon Divison)
Pennsylvania	Gary Modi (Pennsylvania DOT) Michael Castellano (FHWA, Pennsylvania Division) Girish (Gary) N. Modi, (PENNDOT)
Virginia	Stephen Read (Virginia DOT) Becky Crowe (FHWA, Virginia Division)
Washington	Matthew Enders (Washington DOT) Chad Hancock (Washington DOT, Southwest Region) John Manix (City of Vancouver, Washington) Don Peterson (FHWA, Washington Division)
Western Federal Lands (FHWA)	Clara Conner (FHWA, Western Federal Lands) Dan Donovan (FHWA, Western Federal Lands)

APPENDIX B. SAFETY CORRIDOR LEGISLATION

Alaska Safety Corridor Legislation

Section 2B.17 FINES HIGHER Plaque (R2-6)

Add the following at the end of the section:

Safety Zone Signing.

Support:

The BEGIN HIGHWAY SAFETY ZONE TRAFFIC FINES DOUBLE (R16-112) and END DOUBLE TRAFFIC FINES (R16-101) signs legally establish the beginning and end of safety zones.

Safety Zones become effective when the Commisioner of the DOT&PF and Commissioner of the Department of Public Safety sign a Highway Safety Corridor Designation form.

Standard:

Safety zone (corridor) signing in accordance with AS 19.10.075 shall only be installed on rural roads that meet the following conditions:

- Are designated as either
    - an Interstate, or
    - a rural major arterial, or
    - a rural major collector with 2000 ADT or more, or
    - a rural minor arterial with 2000 ADT or more.

- Have a three-year fatal+major injury incident rate per mile that exceeds 110% of the statewide average for rural arterials.
- Have a three-year fatal+major injury crash rate per 100 million vehicle miles that exceeds 110% of the statewide average for rural arterials.
- The DOT&PF and the police agency with jurisdiction agree on a coordinated traffic control / traffic patrol plan.
- DOT&PF and the police agree the proposed safety zone will be effective in reducing highway crashes.
- The police agency with jurisdiction agrees to define the amount of enforcement needed to increase safe driver behavior in the safety zone, and to provide that enforcement on an ongoing basis.

No more than ten safety zones shall exist in Alaska at one time.

Option.

The DOT&PF may choose not to sign all road segments that meet the above criteria.

Periods longer than three years (up to 5 years) may be used for incident and injury rates used for establishing safety zones.

Support.

The two accident rates serve different purposes. The per-mile injury rate indicates crash concentration while the per-vehicle mile crash rate is an indication of correctability. If both thresholds are exceeded, safety countermeasures can be expected to significantly reduce crashes.

Guidance.

Safety zones should include road segments of similar character and begin and end at logical locations. If a short non-qualifying segment exists between two qualifying segments, consider extending the zone across the non-qualifying segment. Zones should be no shorter than 5 miles.

Standard.

Safety zone signs shall be removed when the fatal plus major injury rate per mile falls below the statewide average for a three-year period.

Option.

Safety zone signs may be removed sooner if the DOT&PF and police agency with jurisdiction agree the safety zone is no longer effective or conditions have changed in a way that makes the safety zone unnecessary.

Standard.

BEGIN HIGHWAY SAFETY ZONE TRAFFIC FINES DOUBLE (R16-112) signs and SAFETY ZONE SPEED LIMIT (R2-101) signs shall be posted at the beginning of every safety zone, in that order.

END DOUBLE FINES (R16-101) signs shall be posted at the end of every safety zone.

All existing regulatory speed limit signs within the double fines zone shall either be replaced with SAFETY ZONE SPEED LIMIT (R2-101) signs or supplemented with SAFETY ZONE (R16-114) plates.

When a double fine zone is longer than 3 miles, SAFETY ZONE SPEED LIMIT (R2-101) signs or standard SPEED LIMIT (R2-1) signs with SAFETY ZONE (R16-114) plates shall be posted at spacings not greater than 3 miles (+/- ½ mile) within the safety zone.

SAFETY ZONE SPEED LIMIT (R2-101) signs or standard SPEED LIMIT (R2-1) signs with SAFETY ZONE (R16-114) plates shall be installed on the main street on either side of major intersections within safety zone.

Install either SAFETY ZONE BEGIN DOUBLE TRAFFIC FINES (R16-113) or BEGIN HIGHWAY SAFETY ZONE TRAFFIC FINES DOUBLE (R16-112) signs on side streets entering the safety zone. These signs are only required on side streets functionally classified as collector or higher.

California Safety Corridor Legislation

THE PEOPLE OF THE STATE OF CALIFORNIA DO ENACT AS FOLLOWS:

SECTION 1. Section 97 of the Streets and Highways Code is amended to read:
97. (a) A state highway segment shall be designated by the department as a Safety Enhancement-Double Fine Zone if all of the following conditions have been satisfied:

(1) The highway segment is eligible for designation pursuant to subdivision (b).
(2) The Director of Transportation, in consultation with the Commissioner of the California Highway Patrol, certifies that the segment identified in subdivision (b) meets all of the following criteria:

(A) The highway segment is a conventional highway or expressway and is part of the state highway system.
(B) The rate of total collisions per mile per year on the segment under consideration has been at least 1.5 times the statewide average for similar roadway types during the most recent three-year period for which data are available.
(C) The rate of head-on collisions per mile per year on the segment under consideration has been at least 1.5 times the statewide average for similar roadway types during the most recent three-year period for which data are available.

(3) The Department of the California Highway Patrol or local agency having traffic enforcement jurisdiction, as the case may be, has concurred with the designation.
(4) The governing board of each city, or county with respect to an unincorporated area, in which the segment is located has by resolution indicated that it supports the designation.
(5) An active public awareness effort to change driving behavior is ongoing either by the local agency with jurisdiction over the segment or by another state or local entity.
(6) Other traffic safety enhancements, including, but not limited to, increased enforcement and other roadway safety measures, are in place or are being implemented concurrent with the designation of the Safety Enhancement-Double Fine Zone.

(b) The following segments are eligible for designation as a Safety Enhancement-Double Fine Zone pursuant to subdivision (a):
State Highway Route 12 between the State Highway Route 80 junction in Solano County and the State Highway Route 5 junction in San Joaquin County.

(c) Designation of a segment as a Safety Enhancement-Double Fine Zone by the department shall be done in writing and a written notification shall be provided to the court with jurisdiction over the area in which the highway segment is located. The designation shall be valid for a minimum of two years from the date of submission to the court.

(d) After the two-year period, and at least every two years thereafter, the department, in consultation with the Department of the California Highway Patrol, shall evaluate whether the highway segment continues to meet the conditions set forth in subdivision (a). If the segment meets those conditions, the department shall renew the designation in which case an updated notification shall be sent to the court. If the department, in consultation with the Department of

the California Highway Patrol, determines that any of those conditions no longer apply to a segment designated as a Safety Enhancement-Double Fine Zone under this section, the department shall revoke the designation and the segment shall cease to be a Safety Enhancement-Double Fine Zone.

(e) A Safety Enhancement-Double Fine Zone is subject to the rules and regulations adopted by the department prescribing uniform standards for warning signs to notify motorists that, pursuant to Section 42010 of the Vehicle Code, increased penalties apply for traffic violations that are committed within a Safety Enhancement-Double Fine Zone.

(f) (1) The department or the local authority having jurisdiction over these highway and road segments shall place and maintain the warning signs identifying these segments by stating that a "Special Safety Zone Region Begins Here" and a "Special Safety Zone Ends Here."
(2) Increased penalties shall apply to violations under Section 42010 of the Vehicle Code only if appropriate signage is in place pursuant to this subdivision.
(3) If designation as a Safety Enhancement-Double Fine Zone is revoked pursuant to subdivision (d), the department shall be responsible for removal of all signage placed pursuant to this subdivision.

(g) Safety Enhancement-Double Fine Zones do not increase the civil liability of the state or local authority having jurisdiction over the highway segment under Division 3.6 (commencing with Section 810) of Title 1 of the Government Code or any other provision of law relating to civil liability.

(1) Only the base fine shall be enhanced pursuant to this section.
(2) Notwithstanding any other provision of law, any additional penalty, forfeiture, or assessment imposed by any other statute shall be based on the amount of the base fine before enhancement or doubling and shall not be based on the amount of the enhanced fine imposed pursuant to this section.

(h) The projects specified as a Safety Enhancement-Double Fine Zone shall not be elevated in priority for state funding purposes.

(i) The requirements of subdivision (a) shall not apply to the Safety Enhancement-Double Fine Zone established prior to the effective date of this subdivision pursuant to Section 97.4.

(j) The department shall conduct a Safety Enhancement-Double Fine Zone study that relates to pedestrian injuries and fatalities and evaluates the appropriateness of adding additional criteria to subdivision (a) and whether changes or additional criteria should be considered for adoption.

(k) The department shall conduct an evaluation of the effectiveness of all double fine zones that will terminate the same calendar year and submit its findings in one report to the Assembly Committee on Transportation and the Senate Committee on Transportation and Housing one year prior to the termination of the double fine zones. The report shall include a recommendation on whether the zones should be reauthorized by the Legislature.

New Jersey Safety Corridor Legislation

39:3-20.4 "Highway Safety Fund."

5. There is established in the General Fund a separate, nonlapsing, dedicated account to be known as the "Highway Safety Fund." All fines, penalties and forfeitures imposed and collected as a result of the enforcement of section 4 of P.L.2003, c.131 (C.39:3-20.3) and 50 percent of all fines and penalties imposed and collected in enforcement of section 5 of P.L.1983, c.401 (C.39:5B-29), and the increase from the doubling of fines imposed and collected pursuant to section 1 of P.L.1993, c.332 (C.39:4-203.5) in designated safe corridor areas shall be forwarded to the State Treasurer for deposit into the Highway Safety Fund account. The fund shall be administered by the Department of Transportation which shall establish a grant program to fund local law enforcement agencies for special enforcement efforts associated with this act. The department shall annually, in conjunction with the Division of State Police, submit a report on the results of the safe corridor areas and a list of highway safety projects and programs paid for by the fund within the past year to the Senate Transportation Committee and the Assembly Transportation Committee, the President and minority leader of the Senate, and the Speaker and the minority leader of the General Assembly. The moneys in the account shall be used exclusively for highway safety projects and programs, including education, enforcement, capital improvements and such other related measures and undertakings as the Department of Transportation and the Division of State Police may deem appropriate to foster highway safety.

39:4-203.5 Offenses in area of highway construction, repair or designated safe corridor .

" Safe corridor " or " safe corridor area" means a segment of highway under the jurisdiction of the Department of Transportation which, based upon accident rates, fatalities, traffic volume and other highway traffic safety criteria, is identified by the Commissioner of Transportation as a segment warranting designation as a " safe corridor ."

The fine for a motor vehicle offense embodied in the following sections of statutory law, when committed in an area of highway construction or repair, or when committed in a designated safe corridor , shall be double the amount specified by law:

When an area of highway construction or repair is within a safe corridor , the fine for a motor vehicle offense embodied in the preceding sections of statutory law shall be doubled only once. When a safe corridor is within an area of highway construction or repair, the fine for a motor vehicle offense embodied in the preceding sections of statutory law shall be doubled only once. Fines for violation of section 6 of P.L.1997, c.415 (C.39:4-98.7) in a safe corridor or an area of highway construction or repair shall be doubled only once. Notwithstanding any other provision of law, the increase from the doubled fines imposed and collected in designated safe corridor areas shall be forwarded by the person to whom they are paid to the State Treasurer, who shall annually deposit those moneys in the "Highway Safety Fund" established pursuant to section 5 of P.L.2003, c.131 (C.39:3-20.4).

c. (1) Signs designed in compliance with the specifications of the Department of

Transportation or, if appropriate, the toll road authority having jurisdiction over the appropriate highway, shall be appropriately placed, by order of the Commissioner of Transportation, the appropriate local official, or the affected toll road authority, as the case may be, to notify drivers approaching areas of highway construction or repair, or designated safe corridor areas, that the fines are doubled for motor vehicle offenses in those areas.

(2) In addition, all traffic control signs and devices erected or displayed by the State Department of Transportation, a county, a municipality or a toll road authority within an area of highway construction or repair or safe corridor area shall conform to the uniform system specified in the most current "Manual on Uniform Traffic Control Devices for Streets and Highways," prepared by the Federal Highway Administration in the United States Department of Transportation.

d. It shall not be a defense to the imposition of the fines authorized under the provisions of this act that a sign notifying drivers who are approaching highway construction or repair areas, or designated safe corridor areas, that fines are doubled for motor vehicle offenses in those areas was not posted, improperly posted, wrongfully removed or stolen, or that signs or devices were not placed in compliance with the most current "Manual on Uniform Traffic Control Devices for Streets and Highways" as required pursuant to paragraph (2) of subsection c. of this section.

e. The director shall include information concerning the penalties imposed pursuant to this act in any subsequent revision of the New Jersey Driver Manual and the New Jersey Motorist Guide.

f. Safe corridor areas shall be designated by traffic order issued pursuant to P.L.1998, c.28 (C.39:4-8.2 et seq.).

L.1993,c.332,s.1; amended 2003, c.131, s

New Mexico Safety Corridor Legislation

66-7-301. Speed regulation

A. No person shall drive a vehicle on a highway at a speed greater than:

(1) fifteen miles per hour on all highways when passing a school while children are going to or leaving school and when the school zone is properly posted;

(2) thirty miles per hour in a business or residence district;

(3) seventy-five miles per hour; and

(4) the posted speed limit in construction zones posted as double fine zones or other safety zones posted as double fine zones as designated by the [state] highway and transportation department, provided that the posted speed limit shall be determined by an engineering study performed by the state highway and transportation department.

B. In every event, speed shall be so controlled by the driver as may be necessary:

(1) to avoid colliding with a person, vehicle or other conveyance on or entering the highway;

(2) to comply with legal requirements as may be established by the state highway and transportation department or the New Mexico state police division of the department of public safety and the duty of all persons to use due care; and

(3) to protect workers in construction zones posted as double fine zones or other safety zones posted as double fine zones as designated by the [state] highway and transportation department.

C. The speed limits set forth in Subsection A of this section may be altered as authorized in Section 66-7-303 NMSA 1978.

Oregon Safety Corridor Legislation

Note: Sections 5 and 6, chapter 1071, Oregon Laws 1999, provide:

Sec. 5.
(1) In order to determine the effect of increasing fines in safety corridors, the Department of Transportation shall post signs in safety corridors chosen by the department indicating that fines for traffic offenses committed in those safety corridors will be doubled.

(2) (a) The base fine amount for a person charged with an offense that is listed in subsection (3)(a) or (b) of this section and that is committed in a safety corridor chosen by the department under subsection (1) of this section shall be the amount established under ORS 153.125 to 153.145, based on the foundation amount calculated under ORS 153.131. The minimum fine for a person convicted of an offense that is listed in subsection (3)(a) or (b) of this section and that is committed in a safety corridor is the base fine amount so calculated.

(b) The minimum fine for a person convicted of a misdemeanor offense that is listed in subsection (3)(c) to (g) of this section and that is committed in a safety corridor is 20 percent of the maximum fine established for the offense.

(c) The minimum fine for a person convicted of a felony offense that is listed in subsection (3)(c) to (g) of this section and that is committed in a safety corridor is two percent of the maximum fine established for the offense.

(3) This section applies to the following offenses if committed in the designated safety corridors:

(a) Class A or Class B traffic violations.

(b) Class C or Class D traffic violations related to exceeding a legal speed.

(c) Reckless driving, as defined in ORS 811.140.

(d) Driving while under the influence of intoxicants, as defined in ORS 813.010.

(e) Failure to perform the duties of a driver involved in an accident or collision, as described in ORS 811.700 or 811.705.

(f) Criminal driving while suspended or revoked, as defined in ORS 811.182.

(g) Fleeing or attempting to elude a police officer, as defined in ORS 811.540.

(4) A court may not waive, reduce or suspend the base fine amount or minimum fine required by this section. [1999 c.1071 §5; 1999 c.1071 §5a; 2001 c.421 §1; 2003 c.100 §3]

Sec. 6. Section 5, chapter 1071, Oregon Laws 1999, is repealed on January 1, 2008. [1999 c.1071 §6; 2001 c.421 §3; 2003 c.100 §1]

Pennsylvania Safety Corridor Legislation

§ 3326. Duty of driver in construction and maintenance areas or on highway safety corridors.

(a) Areas indicated by traffic-control devices.--The driver of a vehicle shall yield the right-of-way to any authorized vehicle or pedestrian actually engaged in work upon a highway within any highway or utility construction or maintenance area indicated by official traffic-control devices placed in accordance with department regulations, including advanced warning signs or a vehicle having flashing or revolving yellow lights.

(b) Work vehicles displaying flashing lights.--The driver of a vehicle shall yield the right-of-way to any authorized vehicle obviously and actually engaged in work upon a highway whenever the vehicle displays flashing lights meeting the requirements and regulations promulgated by the department.

(c) Fines to be doubled.--For any of the following violations, when committed in an active work zone manned by workers acting in their official capacity or on a highway safety corridor designated under section 6105.1 (relating to designation of highway safety corridors), the fine shall be double the usual amount:

- Section 3102 (relating to obedience to authorized persons directing traffic).
- Section 3111 (relating to obedience to traffic-control devices).
- Section 3112 (relating to traffic-control signals).
- Section 3114 (relating to flashing signals).
- Section 3302 (relating to meeting vehicle proceeding in opposite direction).
- Section 3303 (relating to overtaking vehicle on the left).
- Section 3304 (relating to overtaking vehicle on the right).
- Section 3305 (relating to limitations on overtaking on the left).
- Section 3306 (relating to limitations on driving on left side of roadway).
- Section 3307 (relating to no-passing zones).
- Section 3309 (relating to driving on roadways laned for traffic).
- Section 3310 (relating to following too closely).
- Section 3323 (relating to stop signs and yield signs).
- Section 3326 (relating to duty of driver in construction and maintenance areas).
- Section 3361 (relating to driving vehicle at safe speed).
- Section 3362 (relating to maximum speed limits).
- Section 3702 (relating to limitations on backing).
- Section 3714 (relating to careless driving).
- Section 3736 (relating to reckless driving).
- Section 3802 (relating to driving under influence of alcohol or controlled substance).

(c.1) Applicability of subsection (c).--Fines under subsection (c) shall be doubled only if the active work zone or highway safety corridor where the violation occurred is posted with an official sign in accordance with this section.

(d) Notice.--

(1) Official traffic-control devices shall be appropriately placed to notify motorists that increased penalties apply for moving violations in active work zones signed in compliance with this subsection and subsection (e).

(2) Official traffic control devices shall be appropriately placed to notify motorists that increased penalties apply for moving violations in highway safety corridors.

(e) Posting.--Official traffic-control devices shall be erected at the beginning of an active work zone with a white strobe light or other unique, illuminated light or device. The light or device shall indicate that workers are present in the active work zone. The light or device shall be turned off if no workers are present. An official traffic-control device shall be erected immediately at the end of the active work zone indicating that workers are no longer present.

(July 5, 1989, P.L.164, No.30, eff. 60 days; July 6, 1995, P.L.315, No.48, eff. 60 days; Dec. 23, 2002,
P.L.1982, No.229, eff. 6 months; Sept. 30, 2003, P.L.120, No.24, eff. Feb. 1, 2004)

§ 6105.1. Designation of highway safety corridors.

The department, based upon a traffic and engineering investigation, shall have the power to designate a segment of a highway as a highway safety corridor.

(Dec. 23, 2002, P.L.1982, No.229, eff. 6 months)

Virginia Safety Corridor Legislation

§ 33.1-223.2:8. Highway safety corridor program.

The Commissioner shall establish a highway safety corridor program, under which a portion of Virginia primary system highways and interstate system highways may be designated by the Commissioner as highway safety corridors, to address highway safety problems through law enforcement, education, and safety enhancements. In consultation with the Department of Motor Vehicles and the Superintendent of State Police, the Commissioner shall establish criteria for the designation and evaluation of highway safety corridors, to include a review of crash data, accident reports, type and volume of vehicle traffic, and engineering and traffic studies. The Commissioner shall hold a public hearing prior to the adoption of the criteria to be used for designating a highway safety corridor. The Commissioner shall hold a minimum of one public hearing before designating any specific highway corridor as a highway safety corridor. The public hearing or hearings for a specific corridor shall be held at least 30 days prior to the designation at a location as close to the proposed corridor as practical.

The Department shall erect signs that designate highway safety corridors and the penalties for violations committed within the designated corridors.

§ 46.2-947. Violations committed within highway safety corridor; report on benefits.

Notwithstanding any other provision of law, the fine for any moving violation of any provision of this chapter while operating a motor vehicle in a designated highway safety corridor pursuant to § 33.1-223.2:8 shall be no more than $500 for any violation which is a traffic infraction and not less than $200 for any violation which is a criminal offense. The otherwise applicable fines set forth in Rule 3B:2 of the Rules of the Supreme Court shall be doubled in the case of a waiver of appearance and a plea of guilty under § 16.1-69.40:1 or § 19.2-254.2 for a violation of a provision of this chapter while operating a motor vehicle in a designated highway safety corridor pursuant to § 33.1-223.2:8. The Commissioner shall report, on an annual basis, statistical data related to benefits derived from the designation of such highway safety corridors. This information may be posted on the Virginia Department of Transportation's official website. Notwithstanding the provisions of § 46.2-1300, the governing bodies of counties, cities and towns may not adopt ordinances providing for penalties under this section.

(2003, c. 877.)

APPENDIX C. CALIFORNIA SAMPLE TASK FORCE NAMES AND SLOGANS

Task Force Slogan	Task Force Name
Drive to Stay Alive!	Hwy 12 Safety Task Force
Slow Down! Safety Doesn't Hurt	Safe on 17 Task Force
Safety Counts on 99	Highway 99 Safety Task Force
On the Crest, Safety Is Best	Angeles Crest Traffic Safety (ACTS) Task Force
Be Aware, Drive with Care	Kern 46 Safety Task Force.
Stay Alive on Highway 65	Highway 65 Safety Task Force
Take Time to Be Safe	Highway 74 Safety Task Force
Harvesting Safety	Highway 86 Safety Task Force
Be Aware, Drive with Care	Highway 118 Safety Task Force
Stay Alive, Avoid the Five	Napa County Highway Safety Task Force
Please be Safe on PCH	PCH Traffic Safety Task Force
Stay Alert Stay Alive!	Highway 138 Safety Task Force
Pedestrians—Stay Alert, Stay Alive!	South Los Angeles Pedestrian Safety Task Force
Check Your Feet! Watch the Street	Citizens for Pedestrian Safety (Modesto)
Don't gamble with lives - don't drink and drive!	No More on 44! Safety Task Force (Redding)
You drink, you drive, you'll lose!	Arrive Alive on I-5 Safety Task Force (San Diego)
Driving sober is a safe bet!	I-110 DUI Safety Corridor Task Force (Los Angeles)
Hedge your bets - drive sober!	Highway 4 Safety Task Force (Brentwood)
Drink and drive=gamble. Drive sober=sure thing!	
The odds are against you if you drink and drive.	
Drink and drive? The bets are off!	
Don't be a loser - drive sober!	
Sober driver = sure winner!	

APPENDIX D. SAFETY CORRIDOR FORMS AND PLANS

Alaska Safety Corridor Designation Sample Signature Form

In accordance with Alaska Statute 19.10.075 and Section 2B.17 of the Alaska Traffic Manual, the following section of highway is designated a Highway Safety Corridor:

Parks Highway MP 44.5-53

Effective Date: _____
(actual or expected posting date)

From: The sign marking the beginning of the safety corridor northbound near Milepost 44.5, approximately 600' north of the Church Road intersection

To: The sign marking the beginning of the safety corridor southbound near Milepost 53, approximately 500' west of LaRae Road

_____	_____
Leo von Scheben, Commissioner Department of Transportation and Public Facilities	Walt Moneghan, Commissioner Department of Public Safety
Signature Date: _____	Signature Date: _____

State of Alaska

Alaska Safety Corridor Designation 3E Signature Form

Parks Highway MP 44.5-53

From: The sign marking the beginning of the safety corridor northbound near Milepost 44.5, approximately 600' north of the Church Road intersection.

To: The sign marking the beginning of the safety corridor southbound near Milepost 53, approximately 500' west of LaRae Road.

"Three E's Coordination"

Based upon the preparations noted below, this highway section meets the requirements for highway safety corridor implementation as defined in Alaska Statute 19.10.075 and Section 2B.17 of the Alaska Traffic Manual.

Enforcement. A highway enforcement plan is attached. Necessary agreements for enforcement at the local level have been coordinated and put in place.

_____ Date: _____

Col. Julia Grimes, Director
Headquarters, Alaska State Troopers

Education. An education implementation plan is attached. Public information and education outreach will be coordinated with other highway safety campaigns.

_____ Date: _____

Cindy Cashen, Administrator
Alaska Highway Safety Office, DOT/PF

Engineering. A Safety Corridor Study and engineering implementation plan is attached. Signing and highway improvements have been scheduled.

_____ Date: _____

Gordon Keith, P.E., Regional Director
Central Region, DOT/PF

Alaska Safety Corridor Designation Enforcement Plan Signature Form

Parks Highway MP 44.5-53

Enforcement Implementation Plan

Highway enforcement is planned to be based out of the new Meadow Lakes area Trooper station based on Pittman Road. This facility is scheduled for completion and opening in mid-September 2006. Additional enforcement capability has been planned through the Houston Police office (1 officer) based in Houston, and out of the Mat-Su B Detachment of the Alaska State Troopers as needed.

Officers numbers…general coverage…schedules…

Initial Rollout. A presence of xx officers can be made available in the first two weeks of the effective date of a Safety Corridor providing xx days of advance notice.

Scheduling. Trooper availability varies as staff is assigned elsewhere to target key events and maximize public safety. Key dates for Trooper availability are affected by the following events:

First week of August – Talkeetna Bluegrass Festival
Lat two weeks of August through Labor Day – Alaska State Fair

Other holidays and events are a common time for AST to focus on drunk driving and highway safety, when risk to motorists generally increases. These times will also be times that Safety Corridor enforcement will continue, including…

Labor Day,
Christmas–New Years
Memorial Day
4th of July

As training staff becomes available …added effort at random times is anticipated to occur about xx times per year.

DUI Enforcement. DUI teams are specifically funded to target drunk driving offenses, and cannot be dedicated to general traffic offenses without reducing their mission. To the extent that DUI enforcement overlaps with patrolling Safety Corridors, additional enforcement will come from this team.

Budget. Total Costs…Initial Rollout, Holiday presence, random…estimated at $…… An approved grant agreement for Safety Corridor enforcement has been completed for $xx.

_____ Date: _____

Captain Hans Brinke
Alaska State Troopers

Alaska Safety Corridor Designation Education Plan Signature Form

Highway MP 44.5-53

Education Implementation Plan.

Public information and education outreach will be coordinated with other highway safety campaigns…Currently AST / AHSO funding operates Don't Drink and Drive, Buckle Up campaigns focused on New Years and 4th of July, and on Memorial Day and Labor Day Holidays. Education for safety corridors may be included or built around this calendar.

Initial Rollout. A median and public outreach grant … approved for AST…attached. Can begin within one month's of signature date by Commissioners, or with one month's advance notice of effective date of safety corridor.

Followup Planning. Joint engineering, education, and enforcement follow-up review meetings will be coordinated through this office. Representatives from DOT engineering, DPS enforcement, and the Alaska Highway Safety Office will plan to meet annually as needed to review Safety Corridor needs and performance.

Costs. Grants for education and outreach have been approved to the Alaska State Troopers. They have in-house staff that already coordinate other Highway Safety Campaigns in a quick and cost-effective manner. Their experience and coordination makes them the best candidate for Safety Corridor education.

_____ Date: _____

Cindy Cashen, Director
Alaska Highway Safety Office
Headquarters, DOT/PF

Alaska Safety Corridor Designation Engineering Plan Signature Form

Highway MP 44.5-53

Engineering Implementation Plan.

A Safety Corridor Study has been prepared and accepted by the State Traffic Engineer. The study evaluated the fatality and injury crash trends along this candidate Safety Corridor, and evaluates mitigation options. Agency review of the study was coordinated between the Department of Transportation, the Alaska Highway Safety Office, and the Alaska State Troopers.

Speed Limit Signing Plan. For implementation, a plan for Begin/End Corridor signing, and Safety Zone Speed Limit signs has been drafted. Sign materials are already available in the Maintenance Shop and foundations have been preset, with a plan to use existing signs where practicable. Signs can be put in place using Maintenance crews with two weeks notice. Materials costs are estimated to be around $15,000.

Initial Rollout. A future grant for additional "smart carts" or speed limit trailers is being prepared through the Alaska Highway Safety Office. Two carts are expected to cost approximately $40,000. In the event the carts are not available due to funding and delivery schedules, two existing smart carts used during the summer season of road construction can be made available for up to two week of use.

Two changeable message panels are available for posting at each end of the potential Safety Corridor. These would be administered by the Mat-Su District Maintenance & Operations staff for up to two weeks.

These mobile devices require recharging. Staff time will include overtime to tow and recharge panels every two days. This is estimated to cost around $15,000 based upon experience on the Seward Highway Safety Corridor.

Safety Audit. A field audit of traffic control devices and roadside safety was begun by traffic engineers in June 2006 with a final report expected in August 2006. A list of recommendations and a budget for signing, striping, rumble strips, and other changes to improve highway safety and driver behavior will be developed. If a budget is approved, field changes will be implemented in 2007 based upon the audit.

Costs. Initial engineering implementation can be performed for $30,000. A project account and charge codes has already been established by the Alaska Highway Safety Office for materials and labor. Additional monies will be used for equipment and future safety improvements as they become available.

_____ Date: _____

Scott E. Thomas, P.E.
Regional Traffic Engineer
Central Region, DOT/PF

Oregon Sample Stakeholder Participation Form

Oregon Route 34, Milepost 0.34 – Milepost 10.12(Interstate 5 - Corvallis)
2001-2002 Safety Corridor Action Plan

Stakeholder Participation Form

*Completion of this **"Participation Form"** signifies your interest, support, and commitment to this safety corridor effort and desire to be included in future mailings/updates.*

Category 1: Enforcement

State Police has been contacted and their interest, support and commitment have been secured that the safety corridor will receive patrol priority. All other police agencies are encouraged to participate in this manner, otherwise please consider participating in Category 2: Education.

Police Agency: _____

Contact: _____ Telephone Number: _____

Email Address: _____

Category 2: Education

Public information/education may be deployed in various forms and by any transportation safety advocate, public or private agency. Examples would be safety fairs, county fair presentations, newspaper/community paper articles, traffic safety presentations, billboards, theater slides, flyers, school presentations, brochures, and outreach etc.

If you know of, are willing to lead, or would be willing to participate in a public information and education effort, please complete as much of this section as possible.

Upon completion of efforts please let me know so that the effort can be documented. (Feel free to telephone me for transportation safety materials, information, coordination assistance etc.

Individual/Agency: _____

Address: _____

Interested in: Coordinating/Leading ☐ or Volunteering/Participating ☐

Telephone #: _____ Electronic mail address: _____

Category 3: Engineering

Traffic control device reviews will be addressed by the local ODOT District Maintenance office. Coordination with cities/counties will be conducted if necessary.

Category 4: Emergency Medical Services

Emergency Medical Service providers in the safety corridor have been contacted and are willing to participate in discussions and projects to further these efforts.

Individual/Agency: _____

Address: _____

Interested in: Coordinating/Leading ☐ or Volunteering/Participating ☐

Telephone #: _____ Electronic mail address: _____

Return the completed "Participation Form" to me by November 20, 2001:

Anne Holder, Transportation Safety Coordinator
ODOT Region 2, Traffic Section
455 Airport Road, Building B
Salem, Oregon 97301-5395
(503) 986-2763 Telephone
(503) 986-2840 Facsimile
anne.p.holder@state.or.us

Oregon Sample Annual Safety Corridor Plan

Planning and Evaluation Annual Safety Corridor Plan

Safety Corridor	Designated	Limits	Miles	MP
OR Route 22 (Salem)	Mar-93	Willamette River Bridges to 99W	9	16.15-25.2

Planning Period July 1, 2001 through June 30, 2002

Note: This planning document follows the format of the "Oregon Safety Corridor Planning and Evaluation" guidelines adopted by ODOT Region Traffic Engineers and Managers January 2001.

Problem Identification

The data identifies the problem consists of sporadic increases and decreases in the fatality rates since the safety corridors designation in March 1993. The anticipated calendar year 2000 fatality rate may be the highest fatality rate on record to date. The crash rate has consistently been below the statewide average for similar types of Oregon roadways.

Statistics to track in addition to crash and fatality rate against statewide rates are the number of head-on, turning movement, and rear end type crashes due to the severity of these crash types when they have occurred on this corridor.

Since there is currently several efforts underway to further define the safety problems on this corridor continuation of the safety corridor and safety issues will be reviewed on the next Plan or sooner if additional information is identified. Currently, there is an ODOT Refinement Plan underway and an active Hwy 22 citizen group who is partnering with Polk County in its "Project 22" along with ODOT Safety Corridor efforts.

Activities

- **Enforcement:** Police agency committed that the corridor would be a patrol priority.

Agency	**Oregon State Police**
Contact	_____

Agency	**Polk County Sheriff's Office**
Contact	Sgt. J. VanLaanen, Polk County ((503) 623-9251)

- **Education:** A minimum of four quarterly public information efforts. This may be a combination of print, radio. TV, cable, billboards theater ads, presentations to local schools, civic groups, etc.

Educational activity	Press release of Safety Corridor Plan Implementation
Date	Early 2002
Responsible Party:	ODOT Region 2/ODOT Trans Safety
Completion Date:	_____

Educational activity	_____
Date	_____

Educational activity	_____
Date	_____

Educational activity	_____
Date	_____

- **Engineering:** Annual review of traffic control devices (signing, striping, delineation, illumination) on the corridor for compliance with current standards. Bring TCDs into compliance using the following provisions:

POTENTIAL TRAFFIC CONTROL DEVICE IMPROVEMENTS

- *A) Improvements may be staged over a period of more than one year if costs exceed current available funds. Staging and priorities reviewed and approved by Traffic Management Section.*

TCD	_____	**Location**	_____
Cost to bring into compliance	$_____		
Estimated completion date	_____		
Comments on funding plan and completion			
_____			

- **Emergency Medical Services:** Emergency Medical Service providers in the safety corridor have been contacted and are willing to participate in discussions and projects to further these efforts.

Agency	_____
Contact	_____

Agency	_____
Contact	_____

Alaska Safety Corridor Task Force Sample Annual Meeting Minutes

Highway Safety Corridors
Annual Multiagency Review Team Minutes
Wednesday April 4, 2007

Central Region State Review Team
Kurtis Smith, P.E., State Traffic Engineer, DOT/PF
Scott Thomas, P.E., Central Region Traffic Engineer, DOT/PF
Ron Martindale, Highway Safety Improvement Program Coordinator, DOT/PF
Cindy Cashen, Administrator, Alaska Highway Safety Office, DOT/PF - AHSO
Capt. Hans Brinke, Alaska State Troopers AST

Corridor Specific Attendees
Clint Vardeman, Central Mat-Su EMS, Mat-Su Borough MSB
Chief Bill Chadwick, Girdwood Volunteer Fire Department GFD
Mark Parmelee, Anchorage Area Planner, DOT/PF
Mary Jane Sutliff, Mat-Su Planner, DOT/PF

SAFETY CORRIDORS REVIEWED

- Seward Highway, MP 91 to 117.5, designated May 26, 2006
- Parks Highway, Wasilla to Big Lake, MP 44.5-53, designated, Oct.16, 2006

REVIEW GOALS

- Review Corridor performance to date
- Review "3 E's" strategies used so far
- Recommend new strategies, resources needed

SUMMARY

The Review Team concludes Safety Corridors have reduced severe crashes in the short term. More resources are needed to further prevent and reduce crashes. Severe and fatal crashes have been reduced by more than half on the Seward Highway, and 40% on the Parks Highway. Due to the short duration since implementation, it is too soon to determine if this trend will continue. The summer season typically demonstrates an increase in congestion and severe crash risk.

Seward Highway. One fatal collision occurred in the 10 months since implementation. This was a random crash involving a loose tire falling off a vehicle and striking a motorcyclist. There were no severe injury collisions within the designated corridor. A fatal head-on collision occurred at Milepost 88, south of Girdwood. Two other crashes occurred at Milepost 88 this past winter with similar characteristics but no injuries. The "Mile 88 curve" is an area of concern to the Review Team. It has a reduced speed for conditions and guardrail on both sides of the curve, with continued crashes.

Parks Highway. Two fatal crashes occurred on the Parks Highway within 30 days of each other. One was a rear end collision. Another was a head-on collision. An injury crash involved a left turning vehicle and a vehicle traveling in the opposite direction. Severe crash reductions have not been as significant on this corridor. In October 2006, the same month the corridor was

designated, the Alaska State Troopers opened a new station on Pittman Road in the middle of the corridor

Safety Corridors Performance Data as of April 2007

	Seward Highway	**Parks Highway**
Length	26.94 mi	13.00 mi
Crash rate BEFORE implementation[1]	13.10 per 100 MVM	17.30 per 100 MVM
Crash rate AFTER implementation[1]	1.22 per 100 MVM	10.36 per 100 MVM
Crashes per year in corridor BEFORE implementation	16.45	6.82
Crashes per year in corridor AFTER implementation[2]	1 (Plus 1 other fatal crash occurred at MP 88) [10 months]	3 [6 months]
Tickets issued per quarter BEFORE implementation	490	125 avg
Tickets issued per quarter AFTER implementation	239	125
DUI Arrests BEFORE implementation	Per AHSO	Per AHSO
DUI Arrests AFTER Implementation	Per AHSO	Per AHSO
Enforcement Hours per quarter BEFORE implementation	Per AHSO	Per AHSO
Enforcement Hours per quarter AFTER implementation	Per AHSO	Per AHSO
Education/Media hours BEFORE implementation	Per AHSO	Per AHSO
Education/Media hours AFTER implementation	Per AHSO	Per AHSO
DOT/PF Highway Project Investments Scheduled in near future	$40,000,000	$73,000,000

[1]Fatal + incapacitating crashes only
[2]Note: less than one year's data available, so limited statistical use

RECOMMENDATIONS

Many team issues and concerns were discussed. The resulting lists of action items was developed for each key agency based upon those issues and concerns.

Department of Transportation & Public Facilities, Central Region Highways Division (Engineering)

#	Goal	Responsibility	Goal	Est. Cost,
1	Get copies of updated public comment on Seward Hwy from GFD	DOT/PF	July 1, 07	$0. Staff OH
2	Extend Seward Safety Corridor south of MP 88 curve due to crash data consistency. Update Seward Hwy implementation plans. Post Temporary CMS.	DOT/PF Region to package signature papers for designation.	July 1, 07	$6000.
3	Block Railroad Mileposts from view of Motorists. Reduce/prevent motorist error in Milepost call-in, aids 911 responses on highway.	DOT/PF to ARRC Staff, both corridors	July 1, 07	$0. ARRC OH
4	Establish marked miles for aerial enforcement, Torch down marks	DOT/PF w/AST input.	July 1, 07	$5,000 /yr
5	Measure speeds using permanent traffic recorders, hoses monthly and during targeted time periods	DOT/PF Hwy Data, Traffic	June 15, 07	$0. Staff OH
6	Establish key times, months for crash problems for AST, AHSO use	DOT/PF	July 1, 07	$0.
7	Install ½ mile markers for more accurate crash reporting to EMS and database.	DOT/PF, M&O	Sept 1, 07	$2500.
8	Track fatal + major injury crashes since implementation.	DOT/PF through AST dispatches, Hwy Dataport	Ongoing	$0 Staff OH
9	Increase use of CMS signs using CMS Manual. Train and provide rules of use to EMS providers. Copy to AST for shelf use, number to call in during crash, conditions. Examine RWIS ability to provide automated CMS messages.	DOT/PF	July 1, 07	$0. Staff OH
10	Deploy smart carts when available	DOT/PF	Sept 1, 07	$0. Staff OH
11	Seek funding to design & install rumble strips, Pass/No Pass signing, Headlights signing (HQ to consider on all projects in 2007)	DOT/PF through HSIP Funding	Sept 1, 2008	$200,000
12	Train Troopers on 12-200 form importance to data analysis. Training Materials.	DOT/PF to Sitka	Aug 15, 07	$750 travel
13	Purchase smart carts for M&O use	DOT/PF; AHSO	Sept 1, 07	$35,000 each x 4 Tools

14	Map Official Streets and Highways Plan identifying Divided Highway, Interstate Routes with access control for 50 year + plan.	DOT/PF HQ Planning	Sept 1, 07	$0 Ongoing now.
15	Schedule, fund and plan to build Divided Highway, Interstate Routes to replace the two designated Safety Corridors. Establish schedule, budget in the Long Range Transportation Plan. Initiate Turnagain Arm Crossing Reconn Study – ways to segregate high speed/low speed, recreational/long distance uses, trip purposes.	DOT/PF HQ Planning	Sept 1, 07	$2,000,000 sep. project Reconn Studies.
16	Evaluate Highway Advisory Radio HAR for corridors. Post signs. Establish schedule with ITS Corridor Implementation plan. Added funds needed after initial planning effort underway now.	DOT/PF Traffic, M&O	June 1, 08	$500,000
17	Design and install interim northbound passing lanes at 5 mile frequency in low impact areas of fill between ARRC and Highway. Design water access if feasible at Indian. Relieves congestion, anger. See MP 75-90, MP 99-105 projects in progress.	DOT/PF Hwy Design Section, phased projects, as part of routine projects	2008 +	$2 million each x 2 sites.
18	Site gravel access to pathway from highway for Emergency Vehicles, with restrictive signing.	DOT/PF Traffic & M&O	Aug 1, 07	$50,000 EMS access
19	Install permanent Changeable Message Boards, departing Girdwood at Key turnaround point and NB before Junction. Added funds needed after ITS Corr. Plng.	DOT/PF	June 1, 08	$600,000

Alaska Highway Safety Office (Education)

#	Goal	Responsibility	Goal	Est. Cost,
1	Track violations, fatal crash reductions over time, and fines distributed. Cost to operate program to safety benefit measure.	AHSO	April 5, 2007	$0. Staff OH
2	Request PSA's with local radio on key holidays, weekends, and enforcement times. Coordinate with AST enforcement targets, DUI teams on holidays, weekends.	AHSO	July 1, 07	$0.
3	Create ads similar to SC DOT's "Highway or Dieway?" - by targeting behavior groups related to severe parked vehicles, head-on, SVROR crashes, fatigue. Air ads during key demographic times coupled with enforcement. Modify behavior, culture of acceptance	AHSO thru AST	Sept 1, 08	$500,000
4	Grant funds or collected Double Fines Safety Corridor funds so DUI Team may also serve dual role as Highway Law Enforcement Team in Safety Corridors.	AHSO	Jan 1, 08	$0. Staff OH
5	Evaluate referring unpaid fines to Collection Agencies	AHSO	July 1, 07	$2,000
6	Evaluate legislation for sobriety checkpoints.	AHSO w/ AG's Office	July 1, 07	$5,000
7	Work to mandate headlight usage by all state agencies while on duty, set example	AHSO request to Governor	July 1, 07	$0, Staff OH

Alaska State Troopers (Enforcement)

#	Goal	Responsibility	Goal	Est. Cost
1	Look at ways to track enforcement hours per Corridor in addition to no.of tickets issued. Modify tickets as needed to track hours at AST HQ	AST	May 1 2007	$0 Staff OH
2	Work with DOT/PF to evaluate cost of DUI teams, hours and tickets invested, versus effect on crashes reduced. Measure crash reduction vs. the cost of offenses per DUI enforcement hour.	AST with DOT/PF	Sept 1, 07	$0. Staff OH
3	Rotate available statewide DUI Teams to Safety Corridors. (Grant Funds)	AST	July 1, 07	$100,000 per diem.
4	Establish agreements with local law enforcement to write state tickets and issue double fines within Corridors. Establish Dispatch recording of crashes to AST Public Information Office for day to day retrieval, monitoring.	AST to reach agreements.	July 1, 07	$0 fines cover costs
5	Schedule aerial speed enforcement, prevent crashes, modify behavior, effective increase in observations	AST	July 1, 07	$100,000, Staff Training OH
6	Evaluate stationing and rotating unmanned patrol cars along corridors. Turn on radar units. Modify behavior	AST	July 1, 07	$120,000.
7	Mandate headlight useage by all state agencies on duty, set example	AST request to Governor	July 1, 07	$0. Staff OH
8	OT Funds stretched to maximum. Seek funding to provide two Troopers during shifts to assist at the Girdwood Post.	AST	July 1, 08	$300, 000/ yr
9	Evaluate in-trunk CMS signs for Trooper vehicles on scene command use, assistance	AST, data from DOT/PF	July 1, 07	$1,000 each.
10	Tap into available additional Administrative position for assistance with media outreach	AST	July 1, 07	$0. Staff OH

Team notes on EDUCATION

Only 40% of fines have been collected to date, $49000 so far. Funds: Double Fines into an account. Goes into General Fund, then to AHSO by law. AHSO to distribute funds accumulated in Mar 2008. Send to the problem sites.
Fix

Initially, AHSO funded a series of Winter Safety Driving advertising spots, then initial Safety Corridors ads on TV and radio. Public Service Announcements are the only tool in progress at this time since Fall 06. There is a need to coordinate and increase awareness with any ongoing policing or other events. A recent poll conducted for work zone awareness by DOT/PF shows that Changeable Message Signs and radio are two of the more effective tools the public notices, and the best methods for reaching motorists.

Target problem driving: reckless, speeding, fatigue, alcohol, passing, lack of seatbelts.. Recent South Carolina DOT ads are very effective at targeting user types ("Highways or Dieways" campaign). Correlate ads/Enforcement with periods of concern: Holidays, Weekends, Hooligan, Fisheries, Dipnet season…

Team notes on ENFORCEMENT:

Regular Trooper positions are not just Highway Patrol jobs. They are full service jobs covering the full range of crimes and enforcement needed.

Currently DOT/PF grant records show the Mat-Su DUI team is used mostly in Mat-Su area. They traveled five times in the past year. The Palmer detachment is a training post. Staff is younger there and must transfer to move up. DUI Team work is a coveted position. As a specialized unit staff can focus on work and not go call-to-call. A second DUI Team in Fairbanks is in place. First major duty was the Arctic Man event. Goal is for DUI teams to be traveling where needed. A Kenai Peninsula DUI Team is being planned and could assist with a Safety Corridor on the Sterling Highway. Recommend three DUI teams around the state, keep them moving, keep the motorists alert. AHSO should strive to provide funds to DUI teams with Double Fines funds, so they can also provide part time Highway Law Enforcement functions.

Local law enforcement agencies have expressed interest in extending services on state highways in or near their jurisdiction. These agencies include the Anchorage Police Department and the Soldotna Police Department. Other agencies which may be available include the Wasilla, Palmer, and Houston Police Departments.

The Troopers are currently at half staffing compared to positions allotted. The pay differential between local and state policing significantly affects recruiting. Paying officers for overtime work can only stretch so far. Borrowing time from local police also is an interim boost, with limited availability, but not a permanent solution as those areas grow and will always need to prioritize local needs over highway assistance. More funding does not necessarily provide more officers. Need to recruit more bodies.

There are concerns about motorists behavior approaching an enforcement action. Will look into ways the "move over" or "slow down" law works and how to make it have more teeth, more solid recommendations. One concern discussed is motorists can't always move over during congested conditions.

Team notes on EMERGENCY MEDICAL SERVICES

Mat-Su EMS Observations

- Large EMS Trucks shield workers at crash sites
- Can't turn large vehicles around effectively on two lane highway. Desired ability to turn around a tanker at site.
- Smaller vehicles, ambulances, Troopers, less shielded, more exposed.
- There is always a command vehicle. Could be used as a shadow vehicle.
- Divided Hwy a concern. Needs 80 feet to turn around. Median cuts only help smaller vehicles.
- Median barrier, narrow medians change response times, make them longer.

Girdwood EMS Observations

- Callers confuse railroad mileposts with highway mileposts. Major time issue.
- Areas of concerns: MP 88, MP 97, MP 100; MP 77, 74, 76
- Increase use of reader board
- Coordinate with Municipal response to the north for their input as well
- More than 1 hour from Hospital, time is a lost opportunity
- Rescues in Turnagain Arm, need access for boat. Only access is at 20 Mile R.
- Wants ambulance access to pathway
- Wants to see Double Fines Funds fund EMS response times on corridor
- Can't get a Fire Truck to Rosalind Village on Portage Curve
- Wants ½ mile markers
- Has copies of updated comments from area residents

APPENDIX E. ROAD SAFETY AUDIT PROCESS