

The 2011-2015 Nevada Strategic Highway Safety Plan

A Winning Approach
to Safety



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Fatalities
Drive Safe Nevada

The 2011-2015 Nevada Strategic Highway Safety Plan

A Winning Approach to Safety

June 2011

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Special acknowledgements also go to Chuck Reider and Traci Pearl for their leadership of the process and their on-going commitment to transportation safety.

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Executive Summary

Highway traffic crashes are one of the nation's leading causes of death. There are an annual average of more than 30,000 traffic deaths in the U.S. and 325 traffic deaths in Nevada.

Nevada Strategic Highway Safety Plan

Based on Federal guidance, the Nevada Department of Transportation (NDOT) and Nevada Department of Public Safety, along with numerous other safety partners, finalized and adopted the Nevada Strategic Highway Safety Plan in 2006.

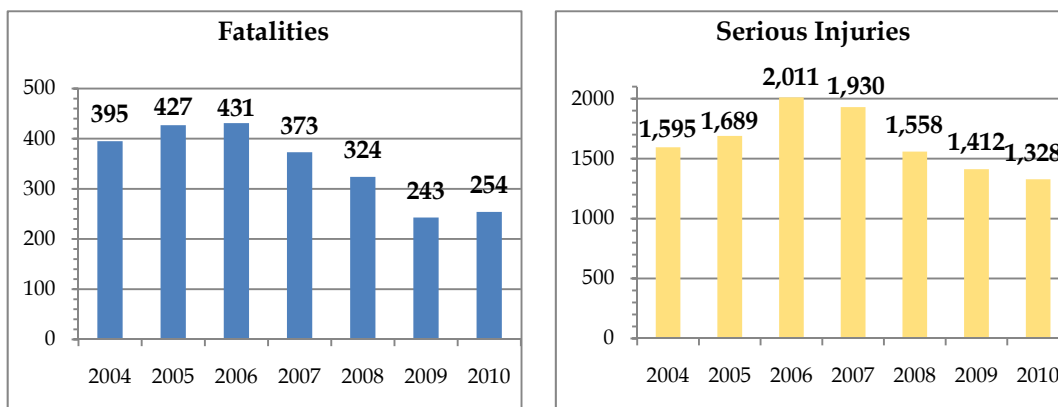
The Nevada SHSP identified five Critical Emphasis Areas (CEAs) where there were a relatively high number of fatalities:

- Impaired Driving
- Lane Departures
- Seat Belts
- Pedestrians
- Intersections

Using the 4Es of Safety (enforcement, engineering, education, and emergency medical services), multidisciplinary groups identified 20 strategies supporting the five CEAs.

Traffic Safety Successes

Since the establishment of the Strategic Highway Safety Plan, annual Nevada traffic fatalities have declined from 431 in 2006 to 254 in 2010, with a corresponding decline in serious injuries. It should be noted that 2008 and 2009 serious injury data is incomplete due to data availability.



A New Goal: Updating the Nevada Strategic Highway Safety Plan

While fewer traffic deaths are a positive sign of progress, one fatality is one too many.

To further save lives, Nevada in 2010 adopted a Zero Fatalities goal. This goal is consistent with the national Toward Zero Deaths strategy sponsored by the Federal Highway Administration (FHWA), the National Highway Traffic Safety Administration (NHTSA), American Association of State Highway and Transportation Officials (AASHTO), and the Governors Highway Safety Association (GHSA).



To reach our Zero Fatalities goal, Nevada needed to update the 2006 SHSP in the following ways:

- Review data to confirm that Nevada remains focused on the traffic safety problems that cause the greatest number of fatalities and serious injuries, as well as those where the opportunity is greatest for improvement.
- Establish interim goals to reduce traffic-related fatalities and serious injuries to one-half of year 2008 levels by 2030.

To achieve the interim goal, Nevada will need to:

- Reduce annual fatalities from the baseline five-year (2004-2008) average of 390 to 328 by 2015.
- Reduce annual serious injuries from the baseline five-year (2004 to 2008) average of 1,757 to 1,409 in 2015.

Critical Emphasis Areas

The analysis of crash data for the SHSP update concluded that the SHSP critical emphasis areas should remain:

- Impaired Driving
- Lane Departures
- Seat Belts
- Pedestrians
- Intersections

Documented in this update are 19 strategies and accompanying actions to continue to reduce crashes, and fatal and serious injury crashes. This plan also includes measurable objectives to track the progress of each strategy and action step. This document provides a summary of the emphasis areas and strategies that will guide Nevada's traffic safety efforts over the next five years.

Background

The American Association of State Highway and Transportation Officials (AASHTO) and the Federal Highway Administration (FHWA) developed Strategic Highway Safety Plans (SHSP) to present an improved process to reduce fatal and life-changing injury crashes. These plans encouraged states to develop their own SHSPs that are comprehensive, systematic, integrated, stakeholder-involved, data-driven, and proactive. The FHWA asked states to address key objectives of setting a safety goal, identifying the highest priority safety strategies, and analyzing safety investment practices to determine effective methods to achieve adopted goals.

Nevada's SHSP is a statewide, comprehensive safety plan that provides a coordinated framework for reducing fatalities and serious injuries on all public roads. The SHSP establishes statewide goals and critical emphasis areas developed in consultation with Federal, state, local, and private-sector safety stakeholders.

The goal of the SHSP is to reduce motor vehicle crashes and the resulting fatalities and serious injuries by combining and sharing resources across disciplines and targeting efforts to the areas of greatest need. Nevada enlisted state, local, and Federal agencies; institutions; private-sector firms; and concerned citizens to help solve this problem.

Nevada's efforts to develop an SHSP began with Nevada Department of Transportation (NDOT) Director Susan Martinovich instructing NDOT Safety Engineering to prepare an SHSP, which started in 2004, when the office formed the Technical Working Group (TWG). The formation of the Nevada Executive Committee on Traffic Safety (NECTS) followed in September 2005.

The role of the NECTS in the development of the Nevada SHSP was to provide guidance, approve the document, and help gain consensus at a high level among the many local, state, and Federal agencies with a stake in traffic safety. The TWG, which met for the first time on October 7, 2004, was also a multiagency group comprised of traffic safety representatives that supported the activities of the NECTS by providing data and information needed to make decisions and initial recommendations, and ensured the implementation of NECTS decisions.

To help the State focus its highway safety efforts in areas where they can be the most effective, Nevada identified the emphasis areas where there was a relatively high number of fatalities. The identification of five Critical Emphasis Areas (CEAs) occurred at Nevada's first safety summit held on June 16 to 17, 2004. These areas included the following:

1. Making walking and street crossing safer;
2. Reducing impaired driving;

3. Increasing seat belt usage;
4. Improving the design and operation of highway intersections; and
5. Keeping vehicles on the roadway (later expanded to include all areas of lane departure crashes (i.e., minimizing the consequences of leaving the road and reducing head-on and across-median crashes)).

In addition to approving the CEAs, the NECTS also determined the statewide safety goal for the first SHSP, which was set at a 33-percent reduction in the State's traffic fatality rate from 1.91 fatalities per 100 million vehicle miles (MVM) traveled in 2003 to 1.27 fatalities per 100 MVM by 2008, which would save an estimated 100 lives per year.

At the second safety summit, held on November 7 to 8, 2005, multidisciplinary groups reviewed and prioritized strategies from the National Cooperative Highway Research Program (NCHRP) Report 500 series, and organized them into the 4Es of safety as follows:

Enforcement

- Conduct highly publicized Driving Under the Influence (DUI) checkpoints;
- Seize vehicle/license plate for DUI offenses;
- Conduct highly publicized seat belt enforcement campaigns and pass a primary seat belt law;
- Enforce pedestrian laws at high crash areas; and
- Evaluate implementing automated enforcement.

Engineering

- Keep vehicles in their lane;
- Flatten slopes and remove roadside objects;
- Increase pedestrian safety by constructing sidewalks, refuge islands, and upgrading signals;
- Develop access management programs;
- Construct intersection geometric improvements;
- Increase intersection awareness with traffic control devices; and
- Provide for traffic signal upgrades and improvements.

Education

- Supply information on how to maintain vehicles on the roadway;
- Conduct public service campaigns to reduce impaired driving;
- Provide subsidized transportation to/from bars, hotels, etc.; and
- Conduct pedestrian safety education.

Emergency Medical Services

- Conduct first responder training for state patrol, maintenance workers, etc.; and
- Provide ITS technology to reduce response times.

Data Systems

- Improve ability to perform data analysis across agencies; and
- Develop criteria to identify high pedestrian crash locations and crosswalk placement guidelines.

The SHSP has been an effective tool in Nevada resulting in tremendous decreases in fatalities and serious injuries. Figures 1 and 2 show the progress Nevada has achieved in reaching and exceeding the original SHSP goal. Since 2004, traffic-related fatalities in Nevada have dropped by 36 percent from 395 in 2004 to 254 in 2010. Serious injuries show a decrease of 34 percent from a high of 2,011 in 2006 to 1,328 in 2010. Note the serious injuries data was partially incomplete in 2008 and 2009.

Figure 1. Nevada Fatalities

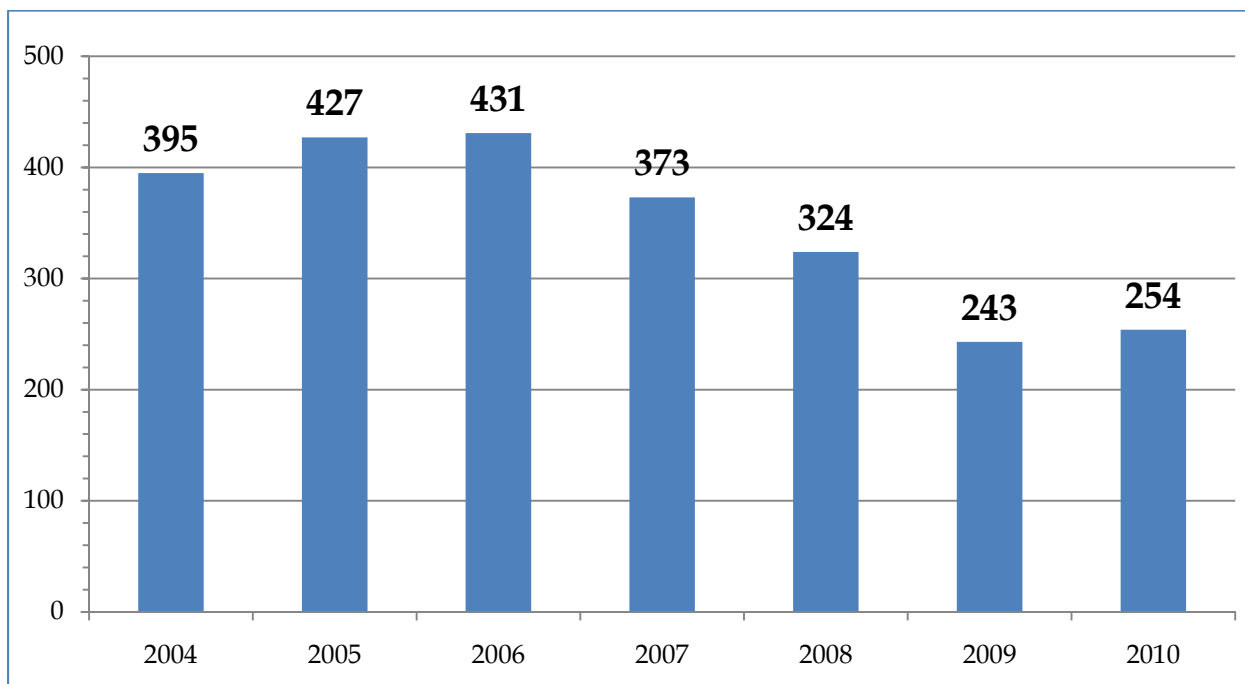
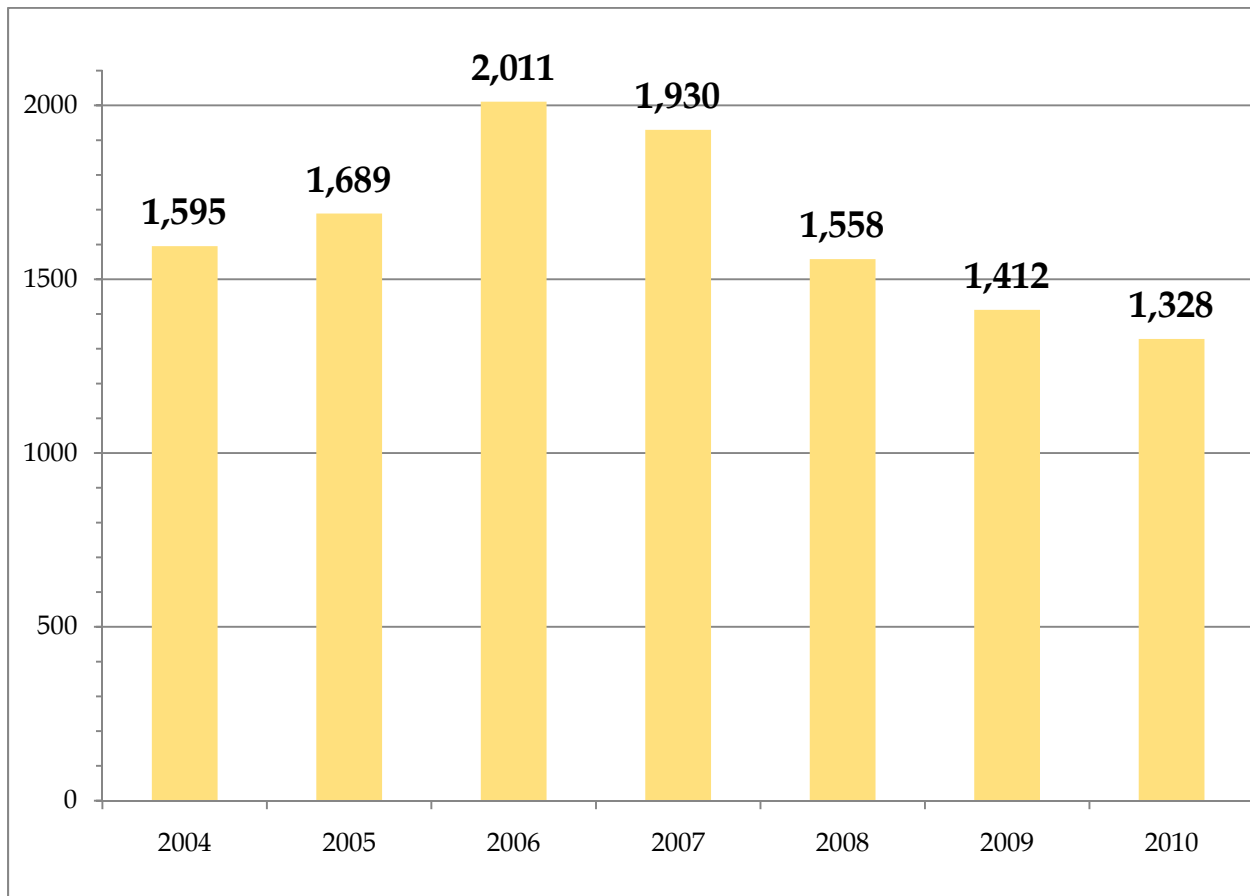


Figure 2. Nevada Serious Injuries

Accomplishments

Nevada has achieved results through the hard work and dedication of hundreds of safety stakeholders, including transportation engineers and planners, law enforcement officers, emergency medical services personnel, and specialists in behavioral education and outreach. The following are some of the major accomplishments achieved by the plan since it was officially launched:

- Approved funding for five behavioral safety-related projects in fiscal year 2009 under the State's Highway Safety Improvement Program's (HSIP) flex funding option, and approved HSIP funding for two data projects in fiscal year 2010;
- Established a comprehensive, broad-based Nevada Seat Belt Coalition to provide education, buy-in, and support for a primary seat belt law;

- Achieved substantial reductions in alcohol-related motor vehicle fatalities from a high in 2000 of 7.91 per 100,000 population to 4.89 in 2007;
- Implemented a Teen Click It or Ticket program;
- Formed a partnership between the NDOT and the Nevada Department of Public Safety's Office of Traffic Safety (OTS) to coordinate messages on DOT dynamic messages signs for major OTS traffic safety campaigns, such as "*Click It or Ticket*" and "*Drunk Driving - Over the Limit, Under Arrest*";
- Expanded the use of roadway safety audits and involved over 60 transportation and road safety experts;
- Implemented 2,800 miles of center-line rumble strips on two-lane roadways throughout Nevada to reduce the potential for lane departure and head-on crashes;
- Initiated new policies and standards in Washoe County to consider a roundabout first when developing new or existing intersection control projects and to include intersection/road name ahead signs at all major intersections;
- Improved pedestrian safety by providing targeted overtime funding for law enforcement initiative to cite noncompliant motorists; and
- Conducted data review and identified a hazardous location in Las Vegas area (Lake Mead Boulevard east of Civic Center Drive), installed median improvements, and conducted an enforcement sting.

SHSP Organizational Structure

Throughout the initial SHSP process and during the plan update, NECTS members led the effort. Members of the Committee include the following:

- NDOT;
- Nevada Department of Public Safety:
 - Office of Traffic Safety, and
 - Nevada Highway Patrol;
- Nevada Department of Motor Vehicles;
- Nevada Department of Health and Human Services;
- Nevada Department of Education;
- RTC Southern Nevada;
- RTC Washoe County;
- Safety Administration;
- Nevada Sheriffs and Chiefs;
- Nevada Association of Counties;
- Nevada League of Cities;
- Administrative Office of the Courts;
- U.S. Department of Transportation:
 - Federal Highway Administration, and
 - Federal Motor Carrier Safety Administration; and
- National Highway Traffic.

Supporting the efforts of the NECTS is the TWG, the CEA teams, and the newly created Data Team and Strategic Communications Alliance (SCA). Figure 3 is an organizational chart showing the relationship of these SHSP entities.

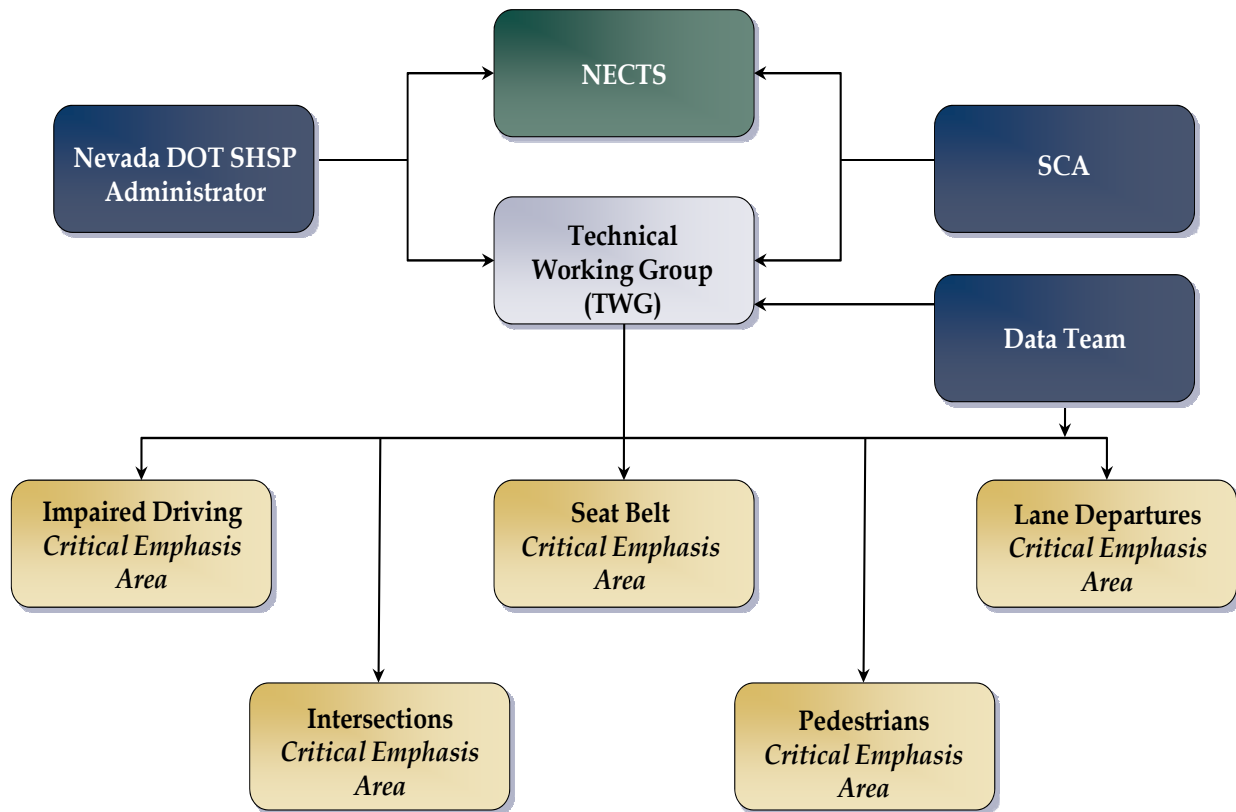
Roles and Responsibilities

To keep the SHSP process moving forward, Nevada established specific roles and responsibilities for each of the entities involved in the plan. A description of those roles is shown below.

Nevada Executive Committee for Traffic Safety

- Establishes SHSP policies and procedures, reviews progress, provides advice and guidance, addresses challenges, and removes barriers;
- Provides support and assistance to specific SHSP strategies as appropriate; and
- Consults the SHSP when updating agency or organization plans and programs and shares progress on safety initiatives.

Figure 3. SHSP Organizational Chart



Technical Working Group

- Reviews progress in each of the CEAs;
- Provides assistance, when appropriate, to overcome barriers or solve problems;
- Provides recommendations to the NECTS on all major SHSP initiatives, such as the Highway Safety Improvement Program (HSIP) and flex projects, updating of the plan, new or revised goals, changes in CEA leadership, etc.;
- Receives updates on SHSP-related campaigns, trainings, or other programs; and
- Leads the SHSP revision.

Critical Emphasis Area Teams

- Ensures team membership is multidisciplinary and includes representatives from at least three of the 4Es of safety (engineering, enforcement, education, and emergency medical services); follows up with State SHSP coordinators if assistance is needed on team composition.

- Schedules meetings of the group, when necessary, and notifies participants; prepares meeting reports including action items after each meeting.
- Tracks progress on implementation of the CEA plan with assistance from the various action step leaders; notifies the State SHSP coordinators if assistance is needed on implementation of any action step.
- Prepares quarterly progress reports describing what has occurred in each of the action steps.
- Reviews the CEA strategies and determines if any should be revised or deleted; identifies new strategies, where appropriate; and develops action plans for each of the CEA strategies.
- Applies the SHSP to help implement a task or project or overcome a barrier.

Data Team

- Oversees implementation of any data projects funded through HSIP; identifies any potential problems for review and comment by the TWG and NECTS.
- Identifies data needs from each of the CEA teams and reports to the Nevada Traffic Records Coordinating Committee (TRCC) on what the teams need.
- Obtains annual data reports from OTS and DOT for use in updating CEA team tracking tools and the SHSP CEA fact sheets; reviews the data to ensure accuracy.
- Requests consultant to obtain the necessary Fatal Analysis Reporting System (FARS) data, and identifies any discrepancies between DOT and OTS data; directs consultant to work with OTS and DOT to overcome any data deficiencies so information can be used for the tracking tools and fact sheets.

Strategic Communications Alliance

- Adopts an SHSP Marketing and Communications Calendar that details the timing and message of public information and education campaigns for the year;
- Reviews and approves all SHSP marketing materials, including the SHSP logo, quarterly newsletter, press releases, and other communication and education materials;
- Participates, whenever possible, in major news media events;
- Develops campaign ideas for CEA emphasis areas not already covered by existing campaigns; and
- Provides technical assistance, when necessary, to local agencies or groups conducting an SHSP-related media event.

Update Process

In October 2009, the NECTS gave approval to update the SHSP with a new goal of zero fatalities. The Committee determined there are two elements to adopting a zero fatality goal – the goal itself and the marketing of the goal so people understand every individual’s goal, even those who are high-risk drivers (impaired, speeding, aggressive, etc.) is zero fatalities. The Committee also recommended specific interim goals be established, and a decision was adopted to reduce traffic-related fatalities and serious injuries in Nevada by one-half by 2030. Figure 4 shows five-year interim goals that will achieve that outcome. For the updated SHSP, which will address Nevada’s traffic safety problems and solutions between 2011 and 2015, the State should reduce fatalities from the 2008 baseline five-year average of 390 to 328 by 2015; and reduce serious injuries from the 2008 baseline five-year average of 1,757 to 1,409 in 2015. The baseline for the plan is a five-year average due to the fluctuations that occur in the number of traffic fatalities and serious injuries from year to year. A five-year average smoothes out those fluctuations and gives a more accurate baseline figure. During the life of the plan (2011 to 2015), the fatality and serious injury objectives for each of the CEAs indicate a 20-percent reduction.

An initial update task involved reviewing fatality and serious injury data to determine the necessity of changing the current CEAs. The TWG used the original 22 emphasis areas in the AASHTO strategic plan as a guide, and found the same five emphasis areas in the first SHSP continue to be a problem. The careful review process used by Nevada ensures the plan is strategic in nature rather than comprehensive, which will help focus resources on the areas of greatest need. Figure 5 shows the data chart used by the TWG and NECTS to approve maintaining the same CEAs (Impaired Driving, Seat Belts, Intersections, Lane Departures, and Pedestrians) in the 2011 updated plan. While the number of pedestrian fatalities did rise to the same level as some of the other traffic safety problems, the NECTS and TWG felt the effort put forth on this effort so far in the Clark County area and plans to increase pedestrian safety activities in the northern part of the State warranted an inclusion as one of the CEAs.

Figure 4. Nevada Fatality and Serious Injury Milestones

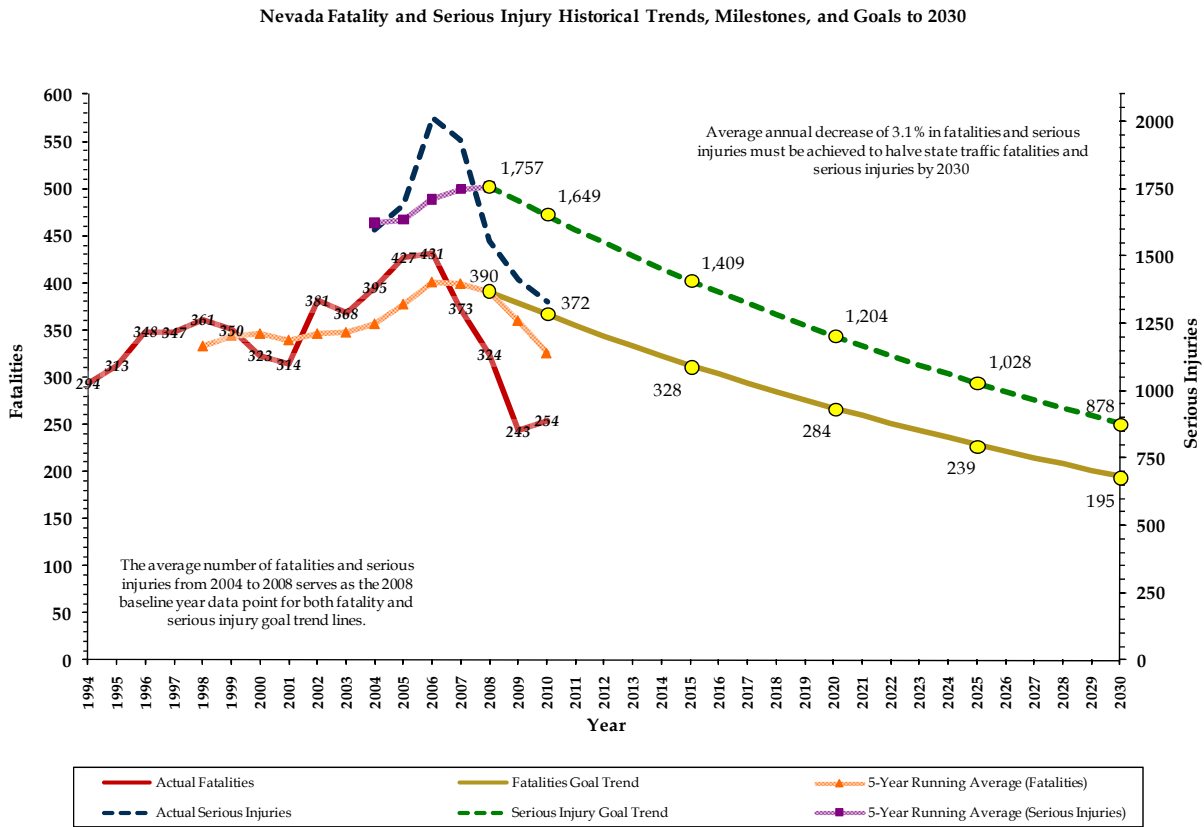


Figure 5. Comparison with AASHTO Emphasis Areas

Fatalities								
Emphasis Area	2004	2005	2006	2007	2008	Total	Avg	
Young Drivers	22	27	28	28	15	120	24	
Older Persons	69	66	51	54	46	286	57.2	
Aggressive/Speeding (Speeding for Cond	111	135	118	70	80	514	102.8	★
Aggressive/Speeding (Reckless Driving)	17	24	16	19	14	90	18	
Impaired	112	135	144	118	107	616	123.2	★
Distracted/Fatigued (Inattentive Driver)	42	6	16	12	9	85	17	
Distracted/Fatigued (Driver Fell Asleep)	18	16	4	9	5	52	10.4	
Seat Belt Use	123	140	147	124	91	625	125	★
Pedestrians	60	63	51	52	56	282	56.4	
Bicyclists	14	10	10	10	7	51	10.2	
Motorcycles	52	56	50	51	59	268	53.6	
Heavy Trucks	30	53	51	29	22	185	37	
Vehicle and Train Crash	0	1	0	0	0	1	0.2	
Run Off the Road	178	163	186	165	122	814	162.8	★
Intersections	97	107	111	110	65	490	98	★
Head-On Collisions	22	47	26	16	21	132	26.4	
Work Zones	12	11	13	7	6	49	9.8	

The list of emphasis areas are only those where data is available. Additional emphasis areas in the AASHTO plan include the following:

- Graduated drivers licensing,
- Licensed , competent drivers,
- Driver safety awareness,
- In-vehicle enhancements,
- Increasing EMS capabilities,
- Improving decision support systems, and
- Process and safety management systems.

Although not included as specific CEAs, motorcycle safety and young drivers will be addressed through strategies in the other CEAs.

As part of the update process, Nevada conducted a series of Road Show meetings to engage safety stakeholders across Nevada and educated them about the SHSP. The meetings also provided an opportunity for input into the SHSP update, and helped market the October SHSP Summit. The meetings, held April 12 to 15, 2010, in Las Vegas, Henderson, Carson City, and Elko, involved over 100 participants who provided some interesting suggestions for the updated plan including the following:

- **Drunk Driving Enforcement Fund.** New Jersey uses surcharges collected from drunk driving convictions to pay for associated enforcement activities, such as administrative costs, equipment, and training.
- **Outreach efforts.** Outreach to minority communities is useful, as residents in such areas are possibly from countries that do not share the same traffic safety culture.
- **Automated Enforcement.** Many states across the United States have used red-light cameras to enforce traffic signal laws; however, the technology has not been approved for use in any jurisdiction in Nevada.
- **Distracted Driving Task Force.** This new group of stakeholders would review current practice and laws to determine measures that could effectively address this issue.

The consensus among presenters and attendees was the meetings were a success. People learned about the SHSP process, their interest was piqued, and opportunities were created for potential synergies among the various safety groups. CEA teams reviewed the information from the road show meetings, discussed whether to maintain any current strategies and action steps, and reviewed proven strategies and countermeasures that are not currently part of the plan. In selecting the final strategies, the teams took the performance measures (reductions in fatalities and serious injuries) for each CEA into consideration.

In addition to the meetings with safety stakeholders throughout the State, SHSP leaders from NDOT and OTS also met individually with members of the NECTS to obtain suggestions on SHSP improvements. Much like the road show meetings, these one-on-one sessions also generated interesting ideas, including the following:

- Provide talking points for NECTS members on the SHSP and upcoming campaigns, such as *Click It or Ticket*.
- Launch a public education campaign on the rules of the road (e.g., move over law), and include information on the purpose of low-cost safety infrastructure improvements (e.g., roundabouts, rumble strips, etc.).
- Reach out to the locals and counties through periodic workshops (e.g., low-cost safety improvements); provide information on the SHSP during the county tours together with leave behind information; and link the SHSP web site to the county web sites. Provide crash data, hot spot state funding (already being done for water and sewer projects), and establish a safety circuit rider program.
- Facilitate a media event during the AASHTO Leadership Conference in Las Vegas, including NECTS members as hosts. Invitees will include the other DOT CEOs, the Nevada Governor, and the state legislators.

In selecting the final strategies for the plan, the CEA teams did the following:

1. Reviewed current strategies and action steps and determined if any should be carried over to the updated plan;
2. Reviewed recommendations from Road Show; and
3. Reviewed proven strategies and countermeasures from the literature and research.

The following is a description of each of those final strategies along with the safety impact.

Impaired Driving

Impaired driving nationally and in Nevada has dropped substantially from a high of 144 fatalities in 2006 to 70 fatalities in 2009. The NHTSA publication, *Countermeasures That Work*, identifies several significant trends that can be attributed to the decrease, including stronger laws (0.08 blood alcohol content or BAC, administrative license revocation, and minimum drinking age laws) to demographic trends (e.g., the aging of the population and the increased proportion of female drivers).



To continue the positive trends in Nevada, the Impaired Driving CEA team identified the following measurable objectives:

- **Objective 1.** Reduce impaired driving fatalities from 2008 baseline of 123 (average fatalities from 2004 to 2008) to 99 by December 31, 2015.
 - **Performance Measures:** Number of fatalities.
- **Objective 2.** Reduce impaired driving serious injuries from 2008 baseline of 295 (average serious injuries from 2004 to 2008) to 237 by December 31, 2015.
 - **Performance Measure:** Number of serious injuries.

To achieve that objective the CEA identified three key strategies:

1. Increase the number of high-visibility DUI programs;
2. Enhance programs on impaired driving for young drivers; and
3. Reduce the number of repeat DUI offenders.

High-Visibility DUI Programs

Definition

Sobriety checkpoints are a law enforcement tool used in 38 states and the District of Columbia as a deterrent to reduce impaired driving. While the research indicates consistent and frequent sobriety checkpoints can be a positive deterrence, few states actually conduct checkpoints on a regular basis. In Nevada, Joining Forces conducts the majority of high-visibility enforcement programs, including sobriety checkpoints. Joining Forces is a program that funds over-time payroll expenses for law enforcement agencies to conduct traffic enforcement events. The use

of multiple funding sources maximizes the benefits of the program and covers the critical program areas, such as Impaired Driving, Occupant Protection, Speed, and Pedestrian Safety.

Impact on Safety

Research conducted by Fell, Ferguson, Williams, and Fields (2003) found only 11 states conducted sobriety checkpoints on a weekly basis due to a lack of personnel and funding. According to *Countermeasures That Work*, a systematic review by the Centers for Disease Control (CDC) of 11 high-quality studies found checkpoints reduced alcohol-related fatal, injury, and property damage crashes each by about 20 percent (Elder et al., 2002). Demonstration programs from seven states found reductions in alcohol-related fatalities between 11 and 20 percent in states that employed numerous checkpoints and intensive publicity of the enforcement activities, including paid advertising (Fell, Langston, Lacey, and Tippetts, 2008).

To improve high-visibility enforcement efforts, the Impaired Driving CEA identified the following action steps:

1. Increase support among law enforcement agencies for high-visibility DUI enforcement programs.
2. Increase earned media coverage of law enforcement activities.
3. Encourage law enforcement agencies to set up impaired driving reporting programs.
4. Encourage other law enforcement agencies to conduct refresher training programs on sobriety testing.
5. Determine high-crash locations/corridors for impaired driving. This program targets all unsafe driving behaviors, including impaired driving and involves engineering (signage), enforcement, and public awareness.

Resources

For additional information on effective countermeasures for impaired driving, go to the following web sites:

- NHTSA web site: <http://www.nhtsa.gov/Impaired>; and
- Stop Impaired Driving web site: <http://www.stopimpaireddriving.org>.

Impaired Driving by Young Drivers

Definition



Since 1987, minimum-drinking-age laws in all states prohibit youth under 21 from purchasing alcohol or consuming it in public. These laws influence all youth impaired-driving strategies. There is strong evidence that minimum drinking age laws reduced drinking, driving after drinking, and alcohol-related crashes and injuries among youth (Hingson et al., 2004). In fact, such laws reduced youth drinking and driving more than youth drinking alone (using the measurements of self-reporting and testing of drinking drivers in fatal crashes). Drinking and driving has become less socially

acceptable among youth, and more youth have separated their drinking from their driving (Hedlund et al., 2001).

Impact on Safety

Research has shown that minimum drinking age enforcement is very limited in many communities (Hedlund et al., 2001). Enforcement can take several forms, including actions directed at alcohol vendors, actions directed at youth, and actions directed at adults. Several studies document that well-publicized and vigorous compliance checks reduce alcohol sales to youth; for example, a review of eight high-quality studies found that compliance checks reduced sales to underage people by an average of 42 percent (Elder et al., 2007). Research by the Centers for Disease Control found that education programs are effective in reducing riding with a drinking driver.

To address this issue in Nevada, the Impaired Driving CEA team identified the following action steps:

1. Enhance DUI education within existing safe driving programs; and
2. Conduct pilot Cops In Shops and Compliance Check programs to reduce youth access to alcohol.

Resources

For more information on effective programs targeting young drivers, visit the following web sites:

- NHTSA web site: <http://www.nhtsa.gov/Teen-Drivers>; and
- National Organizations for Youth Safety web site: <http://www.noys.org/>.

Repeat Offenders

Definition

It is widely recognized that many DUI first offenders and most repeat offenders are dependent on alcohol or have alcohol use problems, and will likely continue to drink and drive without some assistance. A DUI arrest provides an opportunity to identify offenders with alcohol problems and to refer them to treatment, as appropriate. Alcohol interlocks, which prevent alcohol-impaired drivers from starting a vehicle, can also be effective with this population.



The most successful methods for controlling convicted DUI offenders and reducing recidivism monitor offenders closely through formal intensive supervision, home confinement with electronic monitoring, or dedicated detention facilities. DUI courts and alcohol ignition interlocks also assist in monitoring offenders.

Impact on Safety

Research by Beirness and Marques (2004) summarized 10 evaluations of interlock programs in the United States and Canada. Interlocks cut DUI recidivism at least in half, and sometimes more, compared to similar offenders without interlocks. After the removal of the interlock, the effects largely disappeared, with interlock and comparison drivers having similar recidivism rates. A review of 11 completed and three ongoing studies on interlock programs reached similar conclusions (Willis, Lybrand, and Bellamy, 2006).

In Nevada, the Impaired Driving CEA determined the most effective approaches included the following:

1. Support a stronger ignition interlock law by providing information and data that shows effectiveness;
2. Support mandatory evaluation of all DUI offenders including first time offenders; and
3. Establish a Court Monitoring Research Program for misdemeanor DUI offenders.

Resources

For more information on the effectiveness of repeat offender laws, visit the following web sites:

- NHTSA web site: <http://www.nhtsa.gov/Impaired>; and
- Stop Impaired Driving web site: <http://www.stopimpaireddriving.org>.

Safety Belts

The FHWA reported in 2009 approximately 12,850 unbelted vehicle occupants died in traffic crashes nationwide. While the seat belt usage rate has reached an all-time high both nationally and in Nevada, the vulnerability of this population continues to be a top priority. For Nevada in 2009, there were 82 unbelted vehicle occupant fatalities and 287 serious injuries. Run-off-road collisions represent the largest type of crash for seat belt fatalities and serious injuries in Nevada, and ejection from the vehicle killed one-half of the occupants.

To address the issue, the Seat Belt CEA team established measurable objectives for both fatalities and serious injuries.

- **Objective 1.** Reduce unbelted fatalities from 2008 baseline of 125 (average fatalities from 2004 to 2008) to 100 by December 31, 2015.
 - **Performance Measures:** Number of fatalities.
- **Objective 2.** Reduce unbelted serious injuries from 2008 baseline of 899 (average serious injuries from 2004 to 2008) to 721 by December 31, 2015.
 - **Performance Measure:** Number of serious injuries.

To achieve the objectives the Seat Belt CEA identified four key strategies:

1. Enhance data collection and analysis to identify gaps and improve seat belt usage in Nevada;
2. Improve seat belt enforcement and media campaign(s);
3. Enhance public education to groups with lower than average restraint use; and
4. Provide traffic safety education to visiting motorists.

Data Collection and Analysis

Definition

The intent of this strategy is to improve the quality of seat belt usage data based on the ease of data collection, the type of data that is collected, and the types of analyses conducted with the data. Improving the quality of data can help agencies identify where to target resources to increase seat belt use. Nevada currently has a secondary seat belt enforcement law and is considering adoption of a primary law, which research shows is an effective approach. Data plays an important role in informing decision-makers on the need for a primary law.

Impact on Safety

The improvement of seat belt data does not directly affect the safety of transportation system users, rather, data helps inform the decision to implement programs, initiatives, and legislation that directly influence seat belt use. Current research at University of Nevada at Las Vegas is improving the collection and interpretation of seat belt data. This research has led to the development of software to allow users to conduct robust data queries to better identify locations with lower than average restraint use.

In June 2005, belt use averaged 85 percent in the 21 states and the District of Columbia with primary belt laws at that time, and belt use averaged 75 percent in the 27 secondary law states (Glassbrenner, 2005b). Studies of five states that changed their belt use laws from secondary to primary enforcement found that belt use increased from 12 to 18 percentage points where all passenger vehicles were covered by the law, and 8 percentage points in one state where pickup trucks were excluded (Nichols, 2002). The Center for Disease Control and Prevention's systematic review of 13 high-quality studies (Shults, Nichols, Dinh-Zarr, Sleet, and Elder, 2004) found that primary laws increase belt use by about 14 percentage points, and reduce occupant fatalities by about 8 percent compared to secondary laws. In another study, Farmer and Williams (2005) found that passenger vehicle driver death rates dropped by 7 percent when states changed from secondary to primary enforcement. On average, states that pass primary seat belt laws can expect to increase seat belt use by eight percentage points.



While there are proponents and opponents of a primary seat belt law in Nevada, the quality and analysis of data used to facilitate the discussion can inform decision-makers on the latest seat belt trends in the State. Primary seat belt laws permit law enforcement officers to cite a driver if he or she is not wearing a seat belt independent of any other traffic behavior. Secondary enforcement laws only allow citations if the officer stops the individual for another violation.

To address the issue of data quality, the Seat Belt CEA developed the following action steps:

1. Continue to improve the quality, availability, integration, and analysis of seat belt-related data;
2. Support statewide activities pertaining to a primary seat belt law (conduct public meetings, interest group meeting, legislative briefings, etc.);
3. Provide supporting data for draft legislation for a primary seat belt law; and
4. Determine seat belt usage and identify the characteristics of nonusers and part-time seat belt users during daytime and nighttime periods.

Resources

Following is more information on the effectiveness of primary seat belt laws:

- Traffic Safety Facts: Seat Belt Use in 2010, DOT HS 811 378, September 2010; and
- University of Nevada at Las Vegas (<http://nutc.unlv.edu>).

Enforcement and Media Campaigns

Definition

This strategy involves the implementation of carefully coordinated public education and enforcement campaigns to increase the seat belt usage rate. The most common high-visibility belt law enforcement method consists of short (typically lasting for two weeks), intense, highly publicized periods of increased belt law enforcement, frequently using checkpoints (in states where checkpoints are permitted), saturation patrols, or enforcement zones. Billboards, hand-outs, and television/Internet media supplement the enforcement campaigns.

Impact on Safety

Effective, high-visibility communications and outreach are an essential part of successful seat belt high-visibility enforcement programs (Solomon et al., 2003), and paid advertising can be a critical part of the media strategy. Paid advertising brings with it the ability to control message content, timing, placement, and repetition (Milano et al., 2004).

The *Click It or Ticket* (CIOT) campaign evaluations demonstrate the effect of different media strategies. Belt use increased by 8.6 percentage points across 10 states that used paid advertising extensively in their campaigns. Belt use increased by 2.7 percentage points across four states that used limited paid advertising, and increased by only 0.5 percentage point across four states that used no paid advertising (Solomon et al., 2002).



The Seat Belt CEA team recommended implementing the following action steps:

1. Coordinate with safety stakeholders (enforcement, EMS, fire department, etc.) on high-visibility, well-publicized seat belt enforcement campaigns statewide throughout the year (two-week enforcement campaigns on sustained seat belt enforcement and nighttime seat belt enforcement);
2. Conduct additional TV and radio paid and earned media activities in English and Spanish during the CIOT campaign and use of additional nontraditional media venues (i.e., Facebook, MySpace, YouTube, Online Gaming, dynamic message signs (DMS), fast food establishment sponsorships (WalMart in store displays, marquees), etc.);

3. Create youth media contest to design creative and artwork for seat belt messaging; and
4. Develop and begin using a Speaker Bureau of crash survivors to share their experience with the media and CIOT kick-off events, etc.

Resources

For more information on effective high-visibility seat belt enforcement campaigns, review the following information:

- NCHRP Report 500, Volume 11, *A Guide for Increasing Seat Belt Use*, 2004; and
- NHTSA, *Countermeasures That Work*, DOT HS 811, 258, Washington, D.C., January 2010.

Public Education to Groups With Low Use Rates

Definition

Similar to the previous strategy, a carefully coordinated public information and education campaign can increase seat belt usage among groups that have a lower seat belt use rate. Identification of these can be by socioeconomic status, race, ethnicity, age, sex, locale, or any other factor. Care must be taken not to profile members of the community, rather, it should be emphasized the intent of the strategy is to help protect the members of the community by improving their safety. Employers, schools, and similar institutions provide well-defined and somewhat controlled audiences for seat belt use programs; and education and other communications strategies can be tailored to a specific audience or policies implemented and enforced in certain settings. In addition, if the audience speaks a language other than English, the information should be culturally appropriate.

Impact on Safety



While research has shown that high-visibility enforcement programs generally have been effective in increasing belt use among lower-use groups (Shults et al., 2004), enhanced education programs have similar results. An example of a successful model education campaign is one conducted in South Carolina in 2000 that increased safety belt use rate by 8 percentage points for the overall population and by 14 percent for the non-white population (NCHRP, 2004).

The same South Carolina program also resulted in an increase in the seat belt use by males by over 11 percent, and decreased the number of annual fatalities by almost 30 percent.

In Nevada, the Seat Belt CEA team will be working on the following items to increase seat belt use among groups with lower use rates:

1. Work with Strategic Communications Alliance (SCA) to identify appropriate outreach strategies to reach these target groups;

2. Educate Nevada law enforcement on occupant protection laws;
3. Conduct employer programs; and
4. Provide specific seat belt information to public and private driver education instructors, and work with Clark County plan.

Resources

For more information on this topic, review the following publications and on-line information:

- NCHRP Report 500, Volume 11, *A Guide for Increasing Seat Belt Use*, 2004;
- Seat Belts and African Americans: http://www.nhtsa.dot.gov/people/outreach/safesobr/22qp/seatbelt_fact_sheets/seatbelts_afr_amer.html; and
- Seat Belts and Hispanics: <http://www.nhtsa.dot.gov/people/injury/airbags/buckleplan/seatbeltshispanic/index.htm>.

Traffic Safety Education to Visiting Motorists

Definition

Nevada attracts millions of visitors a year, both foreign and domestic; many of whom are unfamiliar with the traffic safety laws of the State. These visitors may assume traffic laws in Nevada are similar to those in the jurisdictions where they reside. Educating these visitors to the traffic laws of Nevada will help ensure they do not commit unnecessary traffic infractions and, in turn, increase safety for the traveling public.

Impact on Safety

There has been little or no research conducted on evaluating the impact of traffic safety education on visiting motorists. However, as the previous strategies have shown, targeted enforcement and education campaigns have proven to be effective in increasing the seat belt use rate. This strategy essentially targets visiting motorists as a group that requires additional education resources. The Department of Motor Vehicles currently produces summary material for the public that can be distributed at locations frequented by visiting motorists, such as car rental agencies, highway rest stops, and hotels.

To address the issue, the Seat Belt CEA team indicated Nevada traffic safety information should be distributed in booklets and fact sheets at all Welcome Centers and other related organizations and agencies.

Resources

For more information on information for out-of-state visitors, go to the following web site:

- Nevada Department of Motor Vehicles Traffic Laws <http://www.dmvnv.com/dltrafficlaws.htm>.

Intersections



The FHWA reports in 2009, there were 33,808 fatalities on the Nation's roadways. Of these, 7,043 or 20.8 percent of total fatalities were intersection or intersection related. In Nevada, intersection fatalities have dropped from a high of 111 in 2006 to 74 in 2009; and serious injuries have decreased 29 percent from 974 in 2007 to 592 in 2009. With different crossing and entering movements by both drivers and pedestrians, an intersection is one of the most complex traffic situations that motorists encounter. The following SHSP measurable objectives will continue to

reduce intersection-related fatalities and serious injuries:

- **Objective 1.** Reduce intersection fatalities from 2008 baseline of 98 (average fatalities from 2004 to 2008) to 79 by December 31, 2015.
 - **Performance Measures:** Number of fatalities.
- **Objective 2.** Reduce intersection serious injuries from 2008 baseline of 457 (average serious injuries from 2004 to 2008) to 367 by December 31, 2015.
 - **Performance Measure:** Number of serious injuries.

The Intersection CEA team identified five key strategies to achieve these objectives:

1. Implement geometric improvements;
2. Increase awareness of safety issues at intersections;
3. Improve operating characteristics of intersections to reduce conflicts;
4. Follow the principles of access management at intersections; and
5. Conduct intersection enforcement.

Implement Geometric Improvements

Definition

Geometric improvements are essentially the physical characteristics that define the layout and cross-section of the roadway, which include the number of lanes, lane width, median or median width, bicycle lanes or sidewalks, etc. Modifying these characteristics can influence crash frequency or severity at an intersection because collectively they influence how motorists, pedestrians, and cyclists interact with each other and the physical environment.

Impact on Safety

To improve safety at an intersection, it is necessary to reduce, simplify, or separate conflicting vehicle, pedestrian and bicycle movements, or reduce the speed of these conflicting movements. The appropriate treatment depends on the crash frequency and severity at a specific site. The Nevada Intersection CEA identified several specific steps to improve geometrics at intersections throughout the State, including the following:

1. Evaluate a roundabout first when developing new or existing intersection control projects;
2. Implement standard use of right-turn and offset left-turn lanes;
3. Implement statewide crosswalk design standards;
4. Implement bus stop placement standards for shared use right-turn lane and bus pull out;
5. Install medians within the influence of all intersection approaches at major intersections;
and
6. Improve geometry of pedestrian and bicycle facilities.

The effectiveness of each of these action steps is based on the environment in which they are implemented (e.g., urban or rural, high or low speed, high or low volume, and/or mix of traffic). One measure of effectiveness involves crash modification factors (CMF), which computes the expected number of crashes after implementing a given countermeasure at a specific site. For instance, installing an offset left-turn lane has a CMF between 0.53 and 0.58, which translates into crash reduction factor between 47 and 42 percent, respectively. Not all treatments, however, have quantitative crash modification factors, which may necessitate further research.

Resources

For additional information on effective countermeasures for intersections, go to the following web sites:

- The Highway Safety Manual: <http://www.highwaysafetymanual.org/>; and
- CMF Clearinghouse: <http://www.cmfclearinghouse.org>.

Increase Awareness of Safety Issues

Definition

Whether signalized or unsignalized, drivers need advanced information about an upcoming intersection. Important advanced information includes the form of intersection control (i.e., traffic signal, roundabout, or STOP sign); pedestrian crossings; directional way-finding; or facilities at the intersection.

Impact on Safety

Advanced information, street name signage, way-finding information, and road striping provide drivers with information they need to make safe decisions about their travel behavior, speed choice, and lane position. The more complete information a driver has the smoother and less erratic their movements will be through the intersection, and thus a lower crash risk. To improve safety awareness at Nevada intersections, the Intersection CEA identified the following action steps:

1. Include intersection/road name ahead signs at all major intersections;
2. Develop statewide intersection signage plan;
3. Conduct intersection sight distance evaluation study;
4. Improve visibility of intersection by providing lighting; and
5. Improve pedestrian/bicycle facilities with signing.

For instance, providing nighttime lighting at an intersection has a CMF of 0.62 for nighttime crashes. This treatment, along with the others recommended by the Emphasis Area Team, are generally low cost and can be easily implemented at most intersections.

Resources

For additional information on the effectiveness of countermeasures at intersections, go to the following web sites:

- The Highway Safety Manual: <http://www.highwaysafetymanual.org/>; and
- CMF Clearinghouse (www.cmfclearinghouse.org).

Improve the Operating Characteristics of Intersections to Reduce Conflicts

Definition

The timing of vehicle traffic and pedestrian and bicycle traffic through an intersection is managed by stop signs or traffic signals. Each traffic signal will have some combination of left-turn, through or right-turn movements, which are called a signal phase. The time management of these movements influences the number of vehicle-vehicle conflicts, vehicle/bicycle-pedestrian conflicts, and the amount of delay for any mode of traffic. The type of traffic control and the phasing of the traffic signal also influence the frequency and severity of traffic crashes. For example, providing protected left-term arrows will reduce the number of angle crashes, but most likely increase the number of rear-end crashes. Angle crashes, however, are typically more severe so there is a positive tradeoff, as well as impact on the number of property damage only (PDO) crashes.

Impact on Safety

The Intersection CEA has identified these two steps to influence safety-related traffic operations at intersections:

- Provide protective/permissive signals and introduce the concept of flashing yellow arrow at intersections; and
- Develop a statewide written policy related to use of permissive left-turn traffic signal phasing.

According to the Highway Safety Manual, modifying traffic signal timing from permissive to protected/permissive left-turn phasing in an urban environment has a CMF for *left-turn crashes* of 0.84 and a standard error of 0.02. Therefore, one can expect to see a 16-percent reduction of left-turn crashes plus or minus 0.02 percent.

Resources

For additional information on improving operating characteristics at intersections, go to the following web sites:

- The Highway Safety Manual: <http://www.highwaysafetymanual.org/>; and
- CMF Clearinghouse (www.cmfclearinghouse.org).

Access Management

Definition

In traffic engineering, access points refer to driveways, and access management is the process of managing the number, spacing, and location of driveways that connect to a roadway. The turns made on to and off of the driveway (right-in/right-out only, left-in/right-in/right-out only, or full movement) are another access management issue. Intersections can also be access points and managing them relates to the number, type, and spacing.

Impact on Safety

Reductions in the number of access points that are close to an intersection or reductions in the type of turning movements allowed to and from driveways can influence crash frequency and severity. For example, elimination of a left turn onto a driveway through the installation of a median near the intersection may reduce crashes through decreased congestion and fewer complex movements. The Intersection Area CEA has identified several action steps that are effective in improving awareness of safety issues at intersections, including the following:

1. Implement statewide and regional access management plans;
2. Ensure statewide and regional access management plans are incorporated into county and city community development and public works standards and codes; and

- Educate the public, private industry, and elected officials on the traffic safety dangers at intersections.

Resources

For additional information on the effectiveness of access management treatments at intersections, go to the following web sites:

- The Highway Safety Manual: <http://www.highwaysafetymanual.org>; and
- CMF Clearinghouse <http://www.cmfclearinghouse.org>.

Intersection Enforcement

Definition

One of the most common causes of intersection crashes is speeding and running red lights. Because it would be impossible to place a police officer at every intersection, many states have turned to automated enforcement, such as speed and red light cameras (RLC), to identify and cite offenders. The use of red light cameras have reduced traffic crashes by about 40 percent at camera sites in Fairfax, Virginia, and Oxnard, California. In addition, violation reductions in both communities carried over to signalized intersections not equipped with cameras, indicating communitywide changes in driver behavior. Although there are safety benefits of automated enforcement programs, there are public concerns that also need to be considered. These concerns relate to invasion of privacy often expressed as “big-brother is watching,” and beliefs that the tool would be used predominately as a “money-maker” and not for safety.



Impact on Safety

A study of RLCs in Oxnard, California, examined citywide effects at signalized intersections. Following the introduction of RLCs, injury crashes declined 29 percent, front-into-side collisions declined 32 percent overall, and front-into-side crashes involving injuries declined 68 percent. The analysis reported a non-significant 3-percent increase in rear-end crashes. An FHWA study in seven cities found right-angle crashes decreased by 25 percent, and rear-end collisions increased by 15 percent. According to the Insurance Institute for Highway Safety¹, automated enforcement (either speed or red light running) is being used in 21 States and the District of Columbia around the Country.

¹ http://www.iihs.org/laws/automated_enforcement.aspx

An important component of implementing either a speeding or a red-light running automated enforcement program is proactive program development. There is ample work upfront required to:

- Addressing public concerns about privacy, effectiveness of alternative options (e.g. increasing yellow time) and revenues;
- Developing partnerships and consensus among transportation agencies, enforcement agencies, legislature², the media, education coalitions, and the judicial system;
- Educating the public about the program, its benefits, how it works, and the potential implications; and
- Researching technical and logistical aspects of program implementation (e.g. selecting a camera system that properly integrates existing traffic signal systems).

To promote the issue in Nevada, the Intersection CEA proposed two action steps, including the following:

1. Research data to determine crashes caused by red light running over the past five years, and provide agencies with information that supports a red light running campaign; and
2. Educate traveling motorists on the severity of red light running through the Nevada Strategic Communications Alliance (SCA), and work with the Alliance to create two public service announcements in 2011.

Resources

For more information about red light cameras, visit the FHWA Office of Safety's web site that has information and studies about the program at <http://safety.fhwa.dot.gov/intersection/redlight/cameras/>.

² Automated enforcement is prohibited in Nevada except with the very specific limitations that the equipment must be hand held by an officer, or installed in a vehicle or facility of a law enforcement agency (**NRS 484A.600** Added to NRS by [1999, 3278](#)) – (Substituted in revision for NRS 484.910)

Lane Departures



Lane departure crashes are a non-intersection crash in which typically a single vehicle crosses an edge or centerline of the travelled way, or crosses a median barrier. In Nevada, fatalities and serious injuries related to lane departure crashes increased between 2008 and 2009. In 2008, fatalities increased by eight percent from 127 in 2008 to 138 in 2009. Serious injuries increased by 21 percent from a low of 350 in 2008 to 491 in 2009.

The Lane Departure CEA team developed the following objectives to reverse the trend in lane departure fatalities and serious injuries.

- **Objective 1.** Reduce lane departure fatalities from 2008 baseline of 165 (average fatalities from 2004 to 2008) to 132 by December 31, 2015.
 - **Performance Measures:** Number of fatalities.
- **Objective 2.** Reduce lane departure serious injuries from 2008 baseline of 292 (average serious injuries from 2004 to 2008) to 234 by December 31, 2015.
 - **Performance Measure:** Number of serious injuries.

To achieve these objectives, the CEA identified three key strategies:

1. Create education/awareness programs for how to maintain vehicles on the roadway lanes;
2. Keep vehicles in their lanes through engineering modifications; and
3. Lessen crash severity in the event of a roadway departure.

Education and Awareness Programs

Definition

This strategy provides the public with the training and tools needed to avoid being in a lane departure crash. Ideally, this would include classroom (i.e., book and/or video) instruction and behind-the-wheel training, which allows drivers to practice recovering the vehicle back onto the roadway in a safe and controlled environment. This could utilize actual vehicles on a closed track with a trained driver equipped with special equipment to prevent rollovers, or driver simulators for practicing techniques in some of the more hazardous situations. The focus of the class could be targeted at high-risk groups (i.e., older driver, young drivers, drivers that

recently received a speeding ticket or were involved in a lane departure crash), but would be general enough that any driver could benefit.

Other useful awareness tactics include developing implementation programs that focus on the dangers of distracted and drowsy driving. Many lane departure crashes occur because the driver did not give full time and attention to the task of driving, or they are overly tired and fall asleep even if only for a few seconds. The issue of distracted driving is gaining greater attention at the national level through efforts by the U.S. Secretary of Transportation, who has held two national Summits in Washington, D.C. on the subject. The issue of distraction and fatigue is particularly dangerous for young drivers and older drivers, who may not be able to correct a driving mistake or error.

Impact on Safety

Many highway safety programs can be enhanced with a properly designed public information and education (PI&E) campaign. The traditional emphasis with PI&E campaigns in highway safety is to reach an audience across an entire jurisdiction or a significant part of it. However, there may be a reason to focus a PI&E campaign on a location-specific problem. While this is a relatively untried approach, as compared with area wide campaigns, use of roadside signs and other experimental methods may be tried on a pilot basis.

According to the NCHRP Research Results Digest 322, there are cases in which public information programs have changed behavior, particularly in situations where there is “new” knowledge. The best example is the changeover in child seating positions in vehicles to avoid air bag inflation injuries. This was a new knowledge situation that also involved fear of injury plus a concrete step to reduce the fear. Public information programs also have an important role to play in producing behavior change when combined with other elements, as a part of broader-based community programs, or in support of law enforcement, such as the high-visibility enforcement campaigns advocated by NHTSA.

In Nevada, the Lane Departure CEA team recommended the following action steps:

1. Review the data and determine if there are certain target groups that are more likely to run-off-the road, and then develop programs to target those audiences;
2. Create a grassroots stakeholder working group to determine problem roads and awareness issues statewide;
3. Develop specific Distracted Driving messages based on crash data to reach target audiences, work with SCA on implementation; and
4. Research opportunities to develop a milepost education program to decrease emergency response times to crashes.

Resources

For more information on the effectiveness of PI&E programs, go to:

- NCHRP Research Results Digest 322 http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rrd_322.pdf.

Engineering Modifications

Definition

Contributing factors to lane departure crashes can be drowsy driving, difficulty navigating a roadway in different weather or at different speeds, or difficulty returning the vehicle to the roadway. These crash types can be mitigated through engineering modifications, which alert drivers they are leaving their travel lane, provide physical assistance to facilitate returning to the travel lane, or provide ample clear space to recover control of the vehicle if the driver leaves the travel way.

Impact on Safety

Lane departure crashes can be severe because they often occur on higher speed rural roads. The higher speeds lead to higher severity crashes because of the momentum of vehicles at impact.

One of the most effective treatments that can lessen crash severity is the Safety Edge, as shown in the photos at right. The more gradual drop-off, as shown in the photo, makes it easier for the motorist to return their vehicle to the roadway. Research is underway to quantify the benefits of the Safety Edge; however, the FHWA has recognized this as a countermeasure likely to reduce the risk and severity of run-off the road crashes.

Another effective treatment is rumble strips, which warn the driver they are leaving the roadway or departing out of their travel lane. The Highway Safety Manual includes a crash modification factor for centerline rumble strips on two-lane rural highways for all crash types of 0.86 with a standard error of 0.05.



http://safety.fhwa.dot.gov/roadway_dept/pavement/safedge/brochure/

Treatments identified by the Lane Departure CEA team to improve the likelihood that a vehicle will not leave the traveled way and if the vehicle does leave the travelled way there is greater likelihood of returning the vehicle to the roadway include the following:

1. Implement centerline rumble strip standards statewide;
2. Install shoulder and centerline rumble strips statewide where feasible;
3. Improve highway curves by evaluating existing curve crash data and providing recommendations of surface friction treatments, reconstruction, and signing;
4. Expand and utilize roadway safety audits statewide and involve local law enforcement agencies;
5. Investigate implementation of Safety Edge statewide; and
6. Develop an Incident Management Manual.

Lessen Crash Severity

Definition

In the event a lane-departure crash does occur, this strategy and series of actions will strive to reduce the severity. One of the major ways to reduce severity is to decrease the likelihood the vehicle will strike something (tree, pole, etc.) or other roadway feature.

Impact on Safety

The Lane Departure Emphasis Area Team has identified the following action items to reduce the potential severity of crashes:

1. Conduct regional implementation of slope flattening projects;
2. Implement median cable barrier statewide; and
3. Decrease animal vehicle crashes.

Slope flattening creates a roadside that that is less likely to flip an errant vehicle, and therefore more likely to allow a motorist to be able to recover control of the vehicle if they have left the traveled way. *The Handbook of Road Safety Measures* (Elvik and Vaa, 2004) provides a CMF for changing a side slope from 1V:3H to 1V:4H of 0.58 with a standard error of 0.04 for serious and minor injury crashes on two-lane roads.



Cable median barriers are relatively inexpensive to install and very effective at capturing vehicles. Their most popular use is in the medians of divided highways. Given the opposing directions of traffic on divided highways, cross median crashes are particularly severe. While median width plays a large role in the occurrence of these crashes, increased width alone does not eliminate them and quite often, the median must be shielded with a barrier. Cable barriers provide a cost-effective solution to the shielding issue.

The cable barrier is more forgiving than traditional concrete (Jersey) or steel barriers when installed on sloping terrain. The flexibility of the system absorbs impact energy and dissipates it laterally, which reduces the forces transmitted to the vehicle occupants.

The FHWA CMF Clearinghouse includes a number of different CMFs for installing cable median barrier. The trends show a reduction in the severity of crashes because motorists are not crossing the median and striking on-coming traffic. However, there is also an increase in lower severity crashes where vehicles strike the median cable barrier.

The severity of animal vehicle crashes will vary as a function of the mass of the animal and the speed of the vehicle on impact. Animal collision countermeasures have been difficult to specify due to the obvious difficulty of managing animal behaviors. However, the number of animal-vehicle crashes has increased substantially over the last decade. Some of the mitigation techniques include highway crossovers for animal crossings and animal detection systems that can detect the animal and warn the driver to slow down.

Resources

To learn more about slope flattening, cable median barriers, or ways to reduce animal-vehicle collisions, visit the FHWA, Office of Safety at: <http://safety.fhwa.dot.gov>.

Pedestrian Safety

The FHWA reports that each year approximately 4,000 people die in pedestrian incidents and another 59,000 are injured. While the numbers are improving both nationally and in Nevada, the vulnerability of this population continues to be a top priority. For Nevada in 2009, there were 36 pedestrian fatalities and 180 serious injuries. A majority of pedestrian fatalities occurred mid-block on a roadway, and a large percent occurred in marked crosswalks. The greatest proportion of pedestrian serious injuries and fatalities occurred at intersections.

To address the issue, the Pedestrian Safety CEA team established measurable objectives for both fatalities and serious injuries.

- **Objective 1.** Reduce pedestrian fatalities from 2008 baseline of 56 (average fatalities from 2004 to 2008) to 45 by December 31, 2015.
 - **Performance Measures:** Number of fatalities.
- **Objective 2.** Reduce pedestrian serious injuries from 2008 baseline of 212 (average serious injuries from 2004 to 2008) to 170 by December 31, 2015.
 - **Performance Measure:** Number of serious injuries.

To achieve those objectives, the Pedestrian CEA team developed four key strategies:

1. Enforce pedestrian laws at high-crash locations;
2. Provide pedestrian safety education for pedestrians and motorists;
3. Develop criteria to identify high-crash locations and placement, design, and implementation guidelines for pedestrian amenities; and
4. Support the creation and implementation of a Washoe County pedestrian safety action plan.

Enforcement at High Crash Locations

Definition

To improve pedestrian safety, this strategy recommends using traditional law enforcement techniques at locations or along corridors with a high incidence of pedestrian crashes, as well as in locations with similar characteristics. Nevada's pedestrian laws cover a number of issues including speeding, drunk driving, and pedestrian public intoxication. There are other laws that address when and where pedestrians should walk (i.e., use a sidewalk, walk on left side facing traffic, use the nearest crosswalk, and obey traffic signals). Motorists also have laws that

pertain specifically to their behavior (i.e., driver must wait for all people to clear the road before proceeding). Since there are a number of pedestrians and motorists who do not follow these laws, states and communities are using enforcement stings to both enforce the law and educate road users. In addition to increasing enforcement, the strategy also includes a component to educate judges and prosecutors to ensure citations are upheld. Over time, frequent dismissal or reductions in charges can lead to an impression these laws are not important.

Impact on Safety

Enforcement is most effective when it is highly visible and publicized to reinforce the message of the required behavior, and to raise the expectation that failure to comply may result in legal consequences.

According to the NHTSA publication, *Countermeasures That Work*, because targeted enforcement can be employed for a wide range of purposes in a wide range of circumstances, no overall statement of effectiveness can be made. In Queens, New York, enforcement was a key part of a campaign that included minor engineering adjustments and communications and outreach and reduced pedestrian fatalities (CDC, 1989). In Seattle, a variety of communications and outreach and enforcement combinations were tested in conjunction with a change in the law for drivers to yield to pedestrians at crosswalks; the authors concluded that enforcement was not successful in increasing driver yielding (Britt et al., 1995).



Van Houten and Malenfant (2004) found that driver yielding to pedestrians increased in response to targeted police enforcement at crosswalks on two corridors in Miami Beach, Florida. Warnings and educational flyers were handed out to most violators, while citations were issued for flagrant violations. Some publicity resulted from the enforcement efforts. Yielding also increased to some extent at other untreated crosswalks in the affected corridors. Increases in yielding were sustained for up to a year following the two-week intensive enforcement efforts with nominal additional enforcement, but effects on crashes and injuries have not been reported.

To implement a targeted enforcement program, the Pedestrian CEA team developed the following action steps:

1. Provide targeted overtime funding so law enforcement can ticket noncompliant motorists;
2. Conduct judicial/court system outreach to help drive home the message of following through with enforcement results;

3. Work with SCA (communications plan and communications calendar to publicize new enforcement initiatives; and
4. Change the language of the Nevada Revised Statutes (NRS) for easier understanding.

Resources

For more information on the effectiveness of enforcement programs on pedestrian safety, go to <http://www.ghsa.org/html/publications/countermeasures/index.html> and review the section on pedestrians.

Pedestrian Safety Education

This strategy is a broad-based approach to improving pedestrian safety awareness and knowledge for pedestrians and motorists. The goal of this strategy is to provide information, and reduce the risk of pedestrian crashes. Motivation to change behavior can be provided through several approaches including educational campaigns and programs, public awareness campaigns, campaigns to targeted groups (i.e., school age children, elderly, motorists, transit riders, etc.) and settings (i.e., school zones, downtowns, Las Vegas Strip, transit stops, etc.); and individual campaigns (i.e., pediatrician discussing child pedestrian safety with parents).

Impact on Safety

An educational strategy should do much more than provide information – the goal is to *motivate* a change in specific behaviors to reduce the risk of pedestrian injuries. The most successful educational messages encourage people to think about their own travel attitudes and behaviors and make better choices to improve their safety. The ways in which travel attitudes and behavior are influenced are now being referred to as “soft” policies, in contrast to “hard” policies that force change (e.g., changes in infrastructure or traffic laws).

In general, although specific education programs might be shown to change targeted behaviors, attitudes, or knowledge levels – and even crashes in large-scale evaluations such as those described above – they are viewed by NHTSA as important components in pedestrian safety initiatives *even if they have not been formally evaluated and proven effective*. This is because of the important role they play in increasing public awareness and complementing engineering and enforcement activities. (NCHRP 2004).

To address the education issue, the Pedestrian CEA developed the following action steps:

1. Coordinate and support statewide pedestrian safety awareness campaigns;
2. Create educational materials for buses and bus shelters – north and south;
3. Target messages to minority and low income neighborhoods; and
4. Create and/or support programs that promote walking or biking to school.

Resources

For more information on ways to improve pedestrian safety, go to http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_500v10.pdf.

Criteria for Pedestrian Amenities

Definition



The purpose of this strategy is to develop a pedestrian network screening strategy to identify appropriate locations for targeted enforcement or engineering improvements. A data-driven procedure ensures the locations will have a significant impact on the problem. The second aspect of this strategy is developing guidelines or templates for the placement and design of pedestrian amenities. The guidelines can range from everyday devices, such as sidewalks and crosswalks, to more uncommon techniques, such as a Danish offset in the photo at left. The guidelines for the

design and especially placement should take into consideration the characteristics of the adjacent roadway (pedestrian and vehicle volumes, width, number of lanes) as much as possible. The design guidelines for many pedestrian safety devices are likely well developed; however, the general consensus for guidelines on where to place these devices is deficient.

Impact on Safety

A key issue for transportation safety work is to maximize the benefits of safety projects within the constraints of limited budgets. Establishing a program to identify sites with potential for pedestrian safety improvements will ensure that sites where pedestrian amenities are being constructed truly need safety improvements; minimizing wasted safety investments. Further, identifying guidelines for type, design, and implementation of pedestrian treatments will lead to consistency of pedestrian facilities in Nevada and, therefore, possibly more consistent, safer pedestrian and driver behaviors. The Pedestrian Safety Emphasis Area team has identified the following actions to support this strategy:

1. Identify high-crash pedestrian locations by most recent crash year.
2. Develop strategies to mitigate problems at high-crash pedestrian locations; as appropriate, conduct road safety audits to identify mitigation measures; program improvements.
3. Develop locally tailored WebCare application for use by elected officials, planners, engineers, and other safety partners to query and display targeted crash information.
4. Identify and implement a pilot pedestrian safety project.
5. Develop and implement more pedestrian-friendly design standards.

6. Implement pedestrian friendly countermeasures in alignment with the FHWA and NCHRP proven/tested strategies.

Resources

For more information on ways to improve pedestrian safety, go to http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_500v10.pdf.

Washoe County Pedestrian Safety Action Plan

Definition

Following the lead of the Regional Transportation Commission (RTC) of Southern Nevada, the RTC of Washoe County will develop a Pedestrian Safety Action Plan (PSAP). The PSAP is a multijurisdictional approach to pedestrian safety that includes goals of guiding future planning and land use as it pertains to pedestrians, targeting specific locations in need of safety enhancements, and implementing policy changes. Multidisciplinary groups representing Federal, state, and local agencies; law enforcement; private planning and engineering firms; and safety advocates are to collaborate on this effort, which should lead to implementation of measures designed to protect pedestrians, including possible modifications to existing infrastructure and policies.

Some of the tools the RTC and other stakeholders will use include digital imaging of urbanized northern Nevada (traffic lanes, signs, crosswalks, etc.) and a geographic information system (GIS) crash database, where users can evaluate crashes by analyzing numerous variables (time of day, crash type and severity, age/sex of those involved, etc.). After the implementation of measures and modifications, the plan calls for ongoing evaluation and assessment.

Impact on Safety

A pedestrian safety action plan can provide focus on pedestrian crashes frequency and severity and with successful implementation have benefits to pedestrian safety. The Pedestrian Safety Emphasis Area Team has identified the following as action items:

1. Coordinate, participate in, and support planning, creation, and implementation of Washoe County PSAP. Activities may include the following:
 - a. Project initiation,
 - b. Technical Working Group meetings,
 - c. Existing conditions,
 - d. Crash analysis,
 - e. Pedestrian safety priorities,
 - f. Safety countermeasures,
 - g. PSAP document (draft and final),

- h. Project presentation,
- i. Funding opportunities, and
- j. Regional design guidelines.

Resources

For more information on ways to improve pedestrian safety, go to http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_500v10.pdf.

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Highway Safety Acronyms

Abbreviation	Definition	Comment/Description
AAA	American Automobile Association	A nonprofit membership of private automobile drivers.
AADT	Average Annual Daily Traffic	The estimate of typical daily traffic on a road segment that considers all days of the week over the period of one year.
AASHTO	American Association of State Highway and Transportation Officials	A member organization for state department of transportation (DOT) chief administrative officials.
CMF	Crash Modification Factor	A crash modification factor (CMF) is a multiplicative factor used to compute the expected number of crashes after implementing a given countermeasure at a specific site.
AMPO	Association of Metropolitan Planning Organizations	AMPO is a nonprofit, membership organization established in 1994 to serve the needs and interests of metropolitan planning organizations (MPO) nationwide. Federal highway and transit statutes require, as a condition for spending Federal highway or transit funds in urbanized areas, the designation of MPOs, which have responsibility for planning, programming, and coordination of Federal highway and transit investments. AMPO offers its member MPOs technical assistance and training, conferences and workshops, frequent print and electronic communications, research, a forum for transportation policy development and coalition building, and a variety of other services. http://www.ampo.org .
APTA	American Public Transportation Association	The American Public Transportation Association (APTA) promotes advocacy, innovation, and information sharing to strengthen and expand public transportation. APTA members serve the public interest by providing safe, efficient, and economical transit services; and by improving those services to meet national energy, environmental, and financial concerns. http://www.apta.com/ .
AR	Annual Report	The report submitted each year (90 days after end of Federal fiscal year [December 31]) by each state highway safety office, which addresses state progress in meeting highway safety goals, using performance measures identified in the performance plan.

Abbreviation	Definition	Comment/Description
AWP	Annual Work Program	MPOs prepare an annual Unified Planning Work Program (UPWP) and state DOTs prepare an annual State Planning and Research (SPR) work program listing the planning activities to be undertaken in a given fiscal year.
AVI	Automatic vehicle identification	Identifies vehicles using light, microwave, or radio frequencies, combining roadside receivers with on-board transponders to automatically identify vehicles.
BAC (BAL)	Blood Alcohol Concentration (or Blood Alcohol Level)	A percent weight of alcohol (measured in milligrams) in a volume of blood (measured in milliliters). Most state laws declare a BAC reading of 0.10 percent to constitute intoxication. As of the year 2000, 17 states and the District of Columbia had lowered the legal BAC to 0.08.
BTS	Bureau of Transportation Statistics	The Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991 established the Bureau of Transportation Statistics (BTS) for data collection, analysis, and reporting; and to ensure the most cost-effective use of transportation-monitoring resources. BTS is one of the 12 modal administrations in U.S. DOT. http://www.bts.gov/ .
CARE	Combined Accident Reduction Effort	A law enforcement program that typically targets the three summer holiday weekends. In some parts of the country, Thanksgiving is also included.
C/CTSP	Community/Corridor Traffic Safety Program	A traffic safety program process within a locality having diverse countermeasures that ideally address a variety of problem areas having the total support of the local's Chief Executive. This program was a forerunner to the "Safe Communities" programs.
CDC	Centers for Disease Control	A Federal agency that provides direction and education to health care practitioners on the prevention and transmission of disease and injury.
CDL	Commercial Drivers License	A license issued by a state or other jurisdiction, in accordance with the standards contained in 49 CFR 383, to an individual which authorizes the individual to operate a class of commercial motor vehicle.
CDLIS	Commercial Driver License Information System	System containing important driver data, such as name, date of birth, and social security number, that "points" to the complete driver record including restrictions, crashes, and convictions, kept by the state issuing the CDL; connected to the 51 licensing jurisdictions in the United States by AAMVAnet, a national electronic communications network.
CEA	Critical Emphasis Area	For Nevada's SHSP, the CEAS include seat belts, impaired driving, intersections, lane departures, and pedestrians.

Abbreviation	Definition	Comment/Description
CODES	Crash Outcome Data Evaluation System	Probabilistic linkage techniques that make it possible for states to link large data files in a very short amount of time at relatively low cost. From the linked data, the states identify the expected medical and financial outcome for specific vehicle, crash, and person characteristics.
COG	Council of Governments	One of a variety of titles given to an urban area organization that is responsible for coordinating planning and other activities on a regional basis.
CPS	Child passenger safety	http://www.nhtsa.dot.gov/CPS/ .
CSD/CSS	Context Sensitive Design/Context Sensitive Solutions	CSD recognizes that the way a highway or road is integrated within a community can have positive or negative effects. Practitioners of CSD/CSS promote flexibility and sensitivity, without jeopardizing traditional design standards. The CSD/CSS approach applies to any project (urban street, rural highway, etc.) as every project has a context as defined by the terrain and topography, the community users, and the surrounding land use.
CSS	Child Safety Seat	A generic term for a device designed to protect an infant or child passenger from injury in an auto collision. (There are many other terms in use, some of which have misleading implications to some people, so be sure to define for your audience the word you use. “Car seat” is used by many manufacturers, but may imply old-style seats not designed for crash protection. “Infant seat” or “Infant carrier” may mean a flimsy household baby holder. “Child restraint” or “Child restraint device” may have negative connotations or seem too technical for use with parents or community members. “Infant car safety seat” and “Convertible car safety seat” are neutral and nontechnical. Refer to FMVSS 213 for the regulations governing child safety seats.)
CVSA	Commercial Vehicle Safety Alliance	Nonprofit organization of Federal, state, and provincial enforcement agencies of the U.S., Canada, and Mexico; major focal point for bringing together government officials and members of the truck/bus industry.
DMV	Department of Motor Vehicles	The DMV issues drivers licenses, vehicle registrations, and license plates in Nevada. The agency’s mission is to provide progressive and responsive service; maintain the highest controls to ensure the accurate collection and timely distribution of revenue; improve safety through licensing, monitoring, and intervention; assist Nevada in meeting its Federally-mandated air quality standards; protect state consumers and businesses against fraud and unfair business practices; and ensure the integrity and privacy of records.

Abbreviation	Definition	Comment/Description
DOT	Department of Transportation	See NDOT.
DPS	Department of Public Safety	Nevada's DPS provides services in support of protecting citizens and visitors by promoting safer communities through prevention, preparedness, response, recovery, education, and enforcement. Divisions include administrative services, capitol police, criminal justice, emergency management, fire marshal, highway patrol, investigations, parole and probation, records and technology, traffic safety, and training.
DUI	Driving Under the Influence of alcohol or other drugs.	Driving or being in actual physical control of a motor vehicle while having an alcohol or drug concentration above the permitted limit as established by each state.
DWI	Driving While Intoxicated or Driving While Impaired	Generic term used in reference to a variety of alcohol- or drug-involved driving offenses. Sometimes equivalent to DUI, sometimes a more severe charge than DUI. In some states, the acronym OWI is used for operating while intoxicated.
ENA	Emergency Nurses Association	ENA's mission is to provide visionary leadership for emergency nursing and emergency care. ENA offers smarter information, education, networking, and representation. It is an international, action-orientated organization ready to support the profession with access to important scientific information and the latest research; networking opportunities with key governmental, academic, and professional contacts; and monitoring of government activities affecting the profession. http://www.ena.org/ .
FARS	Fatality Analysis Reporting System	A database maintained by NHTSA that is intended to be a census (i.e., 100 percent sample) of all highway-related crashes that involve at least one fatality. It is updated annually.
FHWA	Federal Highway Administration	The Federal Highway Administration (FHWA) is a part of the U.S. DOT and is headquartered in Washington, D.C., with field offices across the United States. The FHWA aims to create the best transportation system in the world for the American people through proactive leadership, innovation, and excellence in service. They provide expertise, resources, and information to continually improve the quality of the nation's highway system and its intermodal connections. http://www.fhwa.dot.gov .

Abbreviation	Definition	Comment/Description
FMCSA	Federal Motor Carrier Safety Administration	The Federal Motor Carrier Safety Administration (FMCSA) was established as a separate administration within the U.S. DOT on January 1, 2000, pursuant to the Motor Carrier Safety Improvement Act of 1999. FMCSA's mission is to reduce crashes, injuries, and fatalities involving large trucks and buses. http://www.fmcsa.dot.gov .
FTA	Federal Transit Administration	The FTA is the Federal agency that helps cities and communities nationwide provide mobility to their citizens. Through its grant programs, the FTA provides financial and planning assistance to help plan, build, and operate rail, bus, and paratransit systems. The agency also assists in the development of local and regional traffic reduction. http://www.fta.dot.gov/ .
FY	Fiscal Year	Any 12-month accounting period, but generally used to differentiate from a calendar year. The Federal government fiscal year is October 1 through September 30.
GHSA	Governors Highway Safety Association	The Governors Highway Safety Association (GHSA) is the states' voice on highway safety. The 501(c)(3) nonprofit association represents the highway safety programs of states and territories on the human behavioral aspects of highway safety. Such areas include occupant protection, impaired driving, and speed enforcement, as well as motor carrier, school bus, pedestrian, and bicycle safety. GHSA's mission is to provide leadership in the development of national policy to ensure effective highway safety programs. http://www.ghsa.org/ .
GIS	Geographic Information System	GIS is a computer system capable of capturing, storing, analyzing, and displaying geographically-referenced information; that is, data identified according to location. Practitioners also define a GIS as including the procedures, operating personnel, and spatial data that go into the system.
GPS	Global Positioning System	The Global Positioning System (GPS) is a constellation of navigation satellites called Navigation Satellite Timing And Ranging (NAVSTAR), maintained by the U.S. Department of Defense. A handheld GPS receiver can be an accurate tool for determining their location on the terrain. The GPS receiver helps determine locations on the Earth's surface by collecting signals from three or more satellites through a process called triangulation. Identifying a location on the Earth is more useful when the surrounding topographic conditions also are known. Using a topographic map with the GPS receiver provides important information about features of the surrounding terrain and can help plot an effective route from one location to another.

Abbreviation	Definition	Comment/Description
GR	Governor's Representative for Highway Safety	Highway safety program managers, appointed by the governors of the 50 states, the government of the District of Columbia, the Commonwealths of Puerto Rico and Northern Mariana Islands, and the territories of the Virgin Islands, Guam, American Samoa and the Indian Nation make up the membership of GHSA. These members are responsible for developing and implementing highway safety programs, maintaining fiscal oversight of the programs, and evaluating the programs' impact on highway safety problems.
HazMat (also HM)	Hazardous materials	A chemical substance that may pose an unreasonable risk to health, safety, and property when transported. Transportation of such materials is regulated by the U.S. DOT and subject to state and local regulations.
HERS	Highway Economic Requirements System (HERS) Model	A model maintained by the FHWA that provides estimates of highway investment needs. It simulates the development of improvement projects and keeps track of user impacts, including delay, emissions, and safety.
HSIP	Highway Safety Improvement Program (Federal grant funding program)	Priorities: High-accident locations, roadside obstacle mitigation, rail crossings.
HSIS	Highway Safety Information System	A database maintained by the FHWA compiled from state databases of crashes, roadway characteristics, and traffic. Nine states are currently represented.
HSM	Highway Safety Manual	An effort undertaken by the Transportation Research Board (TRB) similar in scope to the Highway Capacity Manual, but focused on safety. The Manual provides the best factual information and tools in a useful and widely accepted form, to facilitate roadway design and operational decisions based upon explicit consideration of their safety consequences.
HSP	Highway Safety Plan	A state document that describes the projects and activities the state plans to implement to reach the identified performance goals.
HSIP	Highway Safety Improvement Program	Part of Nevada's STIP, the Highway Safety Improvement Program's overall objective is to achieve a significant reduction in traffic fatalities and serious injuries on all public roads.
IACP	International Association of Chiefs of Police	An association of law enforcement executives.
IG	Inspector General	See Office of Inspector General.

Abbreviation	Definition	Comment/Description
IHDSM	Interactive Highway Design Safety Model	A model under development by the FHWA that is intended to provide highway designers with estimates of the safety impacts of their alternative highway designs.
IIHS	Insurance Institute for Highway Safety	The Insurance Institute for Highway Safety is a nonprofit research and communications organization funded by auto insurers. For over 30 years, the IIHS has been a leader in finding out what works and does not work to prevent motor vehicle crashes in the first place, and reduce injuries in the crashes that still occur. The Institute's research focuses on countermeasures aimed at all three factors in motor vehicle crashes (human, vehicular, and environmental) and on interventions that can occur before, during, and after crashes to reduce losses. http://www.highwaysafety.org/ .
IPTM	Institute of Police Traffic Management	An institute that specializes in management and traffic courses for police officers.
ISTEA	Intermodal Surface Transportation Equity Act of 1991	The Intermodal Surface Transportation Equity Act (ISTEA) of 1991 sought to establish a national intermodal transportation system that was economically efficient and environmentally sound, provided the foundation for the nation to compete in the global economy, and would move people and goods in an energy-efficient manner. This Act, viewed as a revolutionary approach to national transportation planning, focused on intermodal transportation with seamless connections between highway, rail, air, and marine modes.
ITE	Institute of Transportation Engineers	The Institute of Transportation Engineers (ITE) is an international individual member educational and scientific association and one of the largest and fastest growing multimodal professional transportation organizations in the world. Members include traffic engineers, transportation planners, and other professionals who are responsible for meeting society's needs for safe and efficient surface transportation through planning, designing, implementing, operating and maintaining surface transportation systems worldwide. http://www.ite.org/ .
ITS	Intelligent Transportation Systems	Management and operations transportation strategies that involve the use of advanced technologies to monitor system conditions, adjust traffic control, and provide feedback to users in real time or near real time.
IVI	Intelligent Vehicle Initiative	As part of the U.S. DOT's Intelligent Transportation Systems (ITS) program, the Intelligent Vehicle Initiative (IVI) program aims to accelerate the development, and commercialization of vehicle-based driver assistance products that will warn drivers of dangerous situations, recommend actions, and assume partial control of vehicles to avoid collisions. IVI automotive technologies address three driving conditions

Abbreviation	Definition	Comment/Description
		where there is the greatest opportunity to improve safety, including normal driving conditions, degraded driving conditions, and imminent crash situation. http://www.its.dot.gov/ivi/ivi.htm .
KABCO	An injury severity scale	Named for the initials of its five severity levels: Killed, A-injury, B-injury, C-injury, no injury.
LOSS	Levels of Service of Safety	An emerging concept that uses qualitative measures to characterize safety of a roadway segment in reference to its expected performance.
MADD	Mothers Against Drunk Driving	A citizen's activist group comprised primarily of people whose family members have been killed or seriously injured by drunk drivers. The group was formed in 1981 and has been recognized for having the greatest influence in strengthening DUI laws and convictions.
MCMIS	Motor Carrier Management Information System	National central repository for safety data maintained by the FMCSA.
MCSAP	Motor Carrier Safety Assistance Program	A Federal grant program conducted by the FMCSA that provides financial assistance to states to reduce the number and severity of accidents and hazardous materials incidents involving commercial motor vehicles.
MMUCC	Model Minimum Uniform Crash Criteria	A minimum set of crash data elements with standardized definitions that are relevant to injury control, highway, and traffic safety.
MPO	Metropolitan Planning Organization	The forum for cooperative transportation decision-making for a metropolitan planning area.
NARC	National Association of Regional Councils	The National Association of Regional Councils (NARC) advocates for regional approaches with Federal and state governments; provide training and technical assistance on the latest regional developments; and conduct research on timely regional topics. http://www.narc.org/ .
NAS	National Academies of Science	The National Academy of Sciences (NAS) is a private, nonprofit, self-perpetuating society of distinguished scholars engaged in scientific and engineering research, dedicated to the furtherance of science and technology and to their use for the general welfare. The Academy has a mandate that requires it to advise the Federal government on scientific and technical matters. http://www4.nationalacademies.org/nas/nashome.nsf .
NASS	National Automotive Sampling System	A program maintained by NHTSA that includes the GES, CDS, and SCI.

Abbreviation	Definition	Comment/Description
NCATS	Nevada Citation and Accident Tracking System	Law enforcement and other agencies collaborate by contributing statewide traffic data to NCATS, which is hosted by the DPS Records and Technology division. NCATS supplies traffic crash data to government and nongovernmental agencies and the public through NDOT Safety Engineering. NCATS data is used in many ways, from planning or mitigating roadway construction and improvement projects to safety program data for better, safer roadways and vehicles. NCATS data is also used to improve outcomes in emergency and trauma medical care. The TRCC and NCATS are funded through NHTSA grants.
NCHRP	National Cooperative Highway Research Program	A shared state DOT research initiative administered by AASHTO and TRB
NCHRP 8-44	Incorporating Safety into Long-Range Transportation Planning	An ongoing NCHRP project to develop improved methods for “Incorporating Safety into Long-Range Transportation Planning.”
NDOT	Nevada Department of Transportation	Established in 1917 with the State Highway Law, which started the active roadway program, now consisting of approximately \$500,000,000 per year of capital outlays to maintain and improve Nevada’s highways. NDOT is responsible for the planning, construction, operation, and maintenance of the 5,400 miles of highway and more than 1,000 bridges that make up the state highway system. The department is divided into three districts, with a district engineer and assistant engineers in each. The districts are responsible for supervising all state transportation activities within their local areas. NDOT’s headquarters building is located in Carson City, with the three main district offices located in Las Vegas, Reno, and Elko. Major maintenance stations are in Ely, Tonopah, and Winnemucca. NDOT is overseen by a seven-member Board of Directors and directed by senior staff.
NECTS	Nevada Executive Committee on Traffic Safety	The role of NECTS in development of the Nevada SHSP is to provide guidance and final approval of document(s) and implementation strategies; and to help gain consensus at a high level among the many local, state, and Federal agencies with a stake in traffic safety. The committee is comprised of agency leaders from NDOT, NHP, OTS, DMV, the Department of Education, Metropolitan Planning Organizations, Nevada State Health Division, Nevada Association of Counties, FHWA, Nevada Sheriffs and Chiefs Association, and the Federal Motor Vehicle Carriers Safety Association.

Abbreviation	Definition	Comment/Description
NHTSA	National Highway Traffic Safety Administration	NHTSA, under the U.S. DOT, was established by the Highway Safety Act of 1970 as the successor to the National Highway Safety Bureau, to carry out safety programs under the National Traffic and Motor Vehicle Safety Act of 1966 and the Highway Safety Act of 1966. NHTSA investigates safety defects in motor vehicles; sets and enforces fuel economy standards; helps states and local communities reduce the threat of drunk drivers; promotes the use of safety belts, child safety seats, and air bags; investigates odometer fraud; establishes and enforces vehicle anti-theft regulations; and provides consumer information on motor vehicle safety topics. NHTSA also conducts research on driver behavior and traffic safety to develop the most efficient means of bringing about safety improvements. http://www.nhtsa.dot.gov/ .
NPRM	Notice of Proposed Rulemaking	The NPRM is published in the Federal Register to allow for comments on draft rulemaking by the Federal government.
NSA	National Sheriffs' Association	An association of county-level law enforcement executives.
NSC	National Safety Council	Nongovernmental public service organization. It provides safety services to meet the needs of industry, insurance safety services, government, schools and community organizations.
NTI	National Transit Institute	The National Transit Institute, at Rutgers, the State University of New Jersey, was established under the Intermodal Surface Transportation Efficiency Act of 1991 to develop, promote, and deliver training and education programs for the public transit industry. The National Transit Institute's mission is to provide training, education, and clearinghouse services in support of public transportation and quality of life in the United States. http://www.ntionline.com/ .
NUTI	Northwestern University Traffic Institute	An Institute that specializes in management and traffic courses for police officers. Sometimes called simply "The Traffic Institute."
OIG	Office of the Inspector General	An Office of the U.S. DOT responsible for performing all audit functions, evaluating the effectiveness of programs, ensuring policies and procedures are followed, and maintaining a system to review and resolve audit findings.
OOS	Out-of-service (order, violation)	Truck is taken off the road for serious safety violation(s).
OS/OW	Oversize/Overweight (permit, truck)	Truck requiring special permit to transport a very large and/or heavy load.

Abbreviation	Definition	Comment/Description
OTS	Office of Traffic Safety	<p>The Nevada Office of Traffic Safety, a division of the Department of Public Safety (DPS), is the Federally recognized highway safety office in the state of Nevada. The Director of DPS serves as the Governor’s Highway Safety Representative.</p> <p>Functional Goals:</p> <ul style="list-style-type: none"> • To encourage the implementation of innovative traffic safety projects at the state and local level that improve motorist awareness, roadway environment, data collection systems, enforcement, and emergency response aimed at reducing the number and severity of traffic crashes on public highways. • To administer a statewide bicycle and pedestrian education program to promote safe bicycle, pedestrian and vehicle interaction on public traffic ways. • To administer a comprehensive motorcycle safety education and training program including selection and enhancement of motorcycle training sites, conducting instructor development workshops aimed toward reducing injuries and fatalities while increasing awareness of motorcycles by other road users.
PAR	Police Accident Report	The form used by police officers to collect information about a traffic crash.
PBCAT	Pedestrian-Bicycle Crash Analysis Tool	A crash typing software product intended to assist with improving walking and bicycling safety.
PID	Problem Identification	A process of analysis (generally data) to isolate specific causes or locations of traffic accidents.
PSA	Public Service Announcement	A television, newspaper, or radio message that is broadcast free of charge by the network or station as a public service.
RID	Remove Intoxicated Drivers	A national organization dedicated to minimizing impaired driving.
RTC	Regional Transportation Commission	RTC is the designation for Nevada’s metropolitan planning organizations in Clark County (RTC of Southern Nevada) and Washoe County (RTC of Washoe County), both key partners in the state’s SHSP efforts.
RTP	Regional Transportation Plan	The Regional Transportation Commissions of Washoe County and Southern Nevada are responsible for their respective RTPs, which outline each region’s long-range transportation plans and anticipated transportation investments. Addressing all modes of travel as well as transportation management strategies, the plans’ guiding principles are to achieve a better balance between

Abbreviation	Definition	Comment/Description
		transportation system planning and accommodating projected growth.
SADD	Students against Destructive Decisions	Groups formed by students to combat drinking and driving among their peers. Their emergence as activists is most prominent during graduation/prom weeks.
SAFER	Safety and Fitness Electronic Records	National safety information exchange system maintained by the Volpe National Transportation Systems Center (VNTSC) for the FMCSA.
SAFETEA-LU	Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users	Signed into law in 2005, SAFTEA-LU represented the largest surface transportation investment in U.S. history, totaling \$244.1 billion for highways, highway safety, and public transportation. SAFETEA-LU addressed the many challenges facing our transportation system today – improving safety, reducing traffic congestion, improving efficiency in freight movement, increasing intermodal connectivity, and protecting the environment – as well as laying the groundwork for addressing future challenges. The legislation, which expired on September 30, 2009, is currently under reauthorization.
SCA	Strategic Communications Alliance	Nevada is one of the first states in the country to develop a committee to assist with all SHSP marketing and communication activities. The mission of Nevada’s SCA, formed in September 2008, is to develop and implement a coordinated traffic safety marketing and communications program for the SHSP among the public- and private-sector agencies and organizations involved with transportation safety to maximize impact and leverage limited resources. Traffic safety communications experts from a variety of public- and private-sector agencies and organizations comprise the SCA.
SCI	Special Crash Investigations	A program maintained by NHTSA that routinely investigates in depth crashes involving factors of high interest, especially rapidly changing technologies.
SCP	Safety Conscious Planning	A comprehensive, systemwide, multimodal, and proactive planning process that’s goal is to prevent the human and economic consequences of transportation-related conflicts that affect all road users by integrating safety into the planning processes.
SFST	Standard Field Sobriety Test	Testing of a DWI suspect at the site of apprehension, usually an assessment of coordination, balance, speech, and horizontal gaze nystagmus to determine if suspect is impaired.
SHSO	State Highway Safety Office	The state agency that administers and manages the State and community Highway Safety Grant Program at the state level.

Abbreviation	Definition	Comment/Description
SHSP	Strategic Highway Safety Plan	In 2004, the NDOT and OTS made the move to create Nevada's Strategic Highway Safety Plan (SHSP). Using guiding principles and key objectives from the FHWA, the plan was officially published in 2006 – with the overall goal of reducing the statewide traffic fatality rate by 33 percent. This equated to a reduction of nearly 100 highway traffic-related fatalities through 2008. Nevada's SHSP has five critical focus areas to accomplish the goal: seat belt usage, lane departures, impaired driving, intersections, and pedestrians.
SMS	Safety Management System	A process for monitoring safety conditions and performance, and developing safety improvements to address safety problems.
SPF	Safety Performance Function	A statistically developed relationship, usually in equation form, that is used to predict crash experience as a function of traffic and highway design features.
STEP	Selective Traffic Enforcement Program	Selective traffic enforcement program focusing on specific areas of concern (e.g., speed, DWI, safety belts).
STIP	Statewide Transportation Improvement Program	The STIP lists all capital and noncapital transportation projects proposed for funding under Title 23 of the Federal-Aid Highway Act or the Federal Transit Act. The projects improve the capacity of Nevada's highways by increasing the number of lanes, building new roads and road extensions, and completing intersection improvements. Also covered are improvements to public and Federal lands highways, transit projects, pedestrian walkways, and bicycle facilities.
STP	Statewide Transportation Plan	Nevada's STP is a policy document that is intended to provide direction and strategies for NDOT over the next 20-years. It is a multimodal plan that explores the issues affecting aviation, bicycles, pedestrians, transit, cars, trucks, and trains and the linkages between them. The plan was developed in accordance with SAFETEA-LU provisions.
TCRP	Transit Cooperative Research Program	The transit equivalent of NCHRP.
TEA-21	Transportation Equity Act for the 21 st Century	On June 9, 1998, the President signed into law PL 105-178, the Transportation Equity Act for the 21 st Century (TEA-21) authorizing highway, highway safety, transit, and other surface transportation programs for the next six years. Subsequent technical corrections in the TEA-21 Restoration Act have been incorporated; thus, the material presented here reflects the combined effects of both Acts and the two are jointly referred to as TEA-21. TEA-21 builds on the initiatives established in the ISTEA, which was the last major authorizing legislation for surface transportation. This new

Abbreviation	Definition	Comment/Description
		<p>Act combines the continuation and improvement of current programs with new initiatives to meet the challenges of improving safety as traffic continues to increase at record levels, protecting and enhancing communities and the natural environment as we provide transportation, and advancing America's economic growth and competitiveness domestically and internationally through efficient and flexible transportation.</p> <p>http://www.fhwa.dot.gov/tea21/index.htm.</p>
TFHRC	Turner-Fairbanks Highway Research Center	An FHWA research facility in McLean, Virginia, which conducts research and development related to new highway technologies, including safety technologies.
TIP	Transportation Improvement Program	A prioritized program of transportation projects to be implemented in appropriate stages over several years (i.e., three to five years). The projects are recommended from those in the transportation systems management element and the long-range element of the planning process. This program is required as a condition for a locality to receive Federal transit and highway grants.
TRB	Transportation Research Board	TRB is a division of the National Research Council, which serves as an independent adviser to the Federal government and others on scientific and technical questions of national importance. TRB's varied activities annually draw on more than 4,000 engineers, scientists, and other transportation researchers and practitioners from the public and private sectors and academia, all of whom contribute their expertise in the public interest. The Board is supported by state transportation departments; the U.S. DOT; and other agencies, associations, organizations, and individuals interested in transportation. www.trb.org .
TRCC	Traffic Records Coordinating Committee	The TRCC is users group, with representation from all of Nevada's NCATS users, traffic engineers, traffic records units, IT professionals, and anyone with a professional relationship with NCATS. The TRCC receives direction from the Traffic Records Executive Committee (TREC), researches and implements projects directed or approved by the TREC; and is a roundtable for discussion of mutual problems, training, and dissemination of information about Nevada traffic records.
TREC	Traffic Records Executive Committee	The TREC develops and oversees the long-range planning efforts of the Highway Safety Information System, investigates the possibilities of linking traffic records systems, and provides vision to the TRCC.

Abbreviation	Definition	Comment/Description
TSI	Transportation Safety Institute	An agency of the U.S. DOT, TSI is dedicated to transportation safety training and education. Much of NHTSA-sponsored training is coordinated through TSI.
TWG	Technical Working Group	For Nevada's SHSP, the TWG is a multiagency group comprised of representatives who are stakeholders in traffic safety. The group meets regularly to support the NECTS by providing data and information needed to make decisions, making recommendations for NECTS consideration, and implementing NECTS decisions.
VMT	Vehicle-Miles Traveled	A measure of highway usage, calculated as the number of miles traveled by all vehicles over a given segment or system. It is commonly used as the denominator (i.e., "exposure" metric) in developing highway crash rates.
WIM	Weigh-in-motion	Technology that dynamically weighs vehicles at highway or ramp speeds, enabling sorting of vehicles for increased weighing capacity and processing of trucks.