



Texas Strategic Highway Safety Plan: A Report of Progress for 2009

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INTRODUCTION

Background

In 2006, the Texas Department of Transportation (TxDOT) produced the initial Strategic Highway Safety Plan (SHSP). In addition to satisfying federal requirements for highway safety planning, it served as an initial attempt to identify key safety needs and guide investment decisions intended to lead to significant reductions in highway fatalities and serious injuries on all public roads.

The 2006 SHSP provides a detailed description of the analysis of crash data, stakeholder survey and workshop of safety professionals used to guide TxDOT in identifying special highway safety emphasis areas. Further, it describes crash reduction goals and objectives related to those issues and countermeasures that might be used to achieve them. Because the SHSP is intended to be a living document, iterations include either an updated version of the Plan from the previous year or a Report of Progress. Updates use new information to build upon the previous framework. Therefore, the current year's update will repeat a great deal of the previous plans and adds newer crash data. Readers in search of a complete history are referred to previous versions of the Plan and Progress Reports.

Where We Are

State crash data, along with travel and population data were used to provide estimates of various measures of roadway safety. Fatalities and fatality rate per one hundred million vehicle miles traveled (100M VMT) and per one hundred thousand population (100K Pop) were computed for the state for the years 1999 through 2008. Serious injuries (A-incapacitating and B-non-incapacitating) and injury rates were computed for the same years. These data are presented in Table 1.

Table 1. Summary of Texas Crash Trends, 1999 – 2008

	Year									
	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Fatalities	3,519	3,775	3,739	3,823	3,821	3,699	3,559	3,521	3,461	3,468
Rate per 100M VMT	1.69	1.76	1.77	1.77	1.75	1.61	1.52	1.48	1.43	1.48
Rate per 100K Population	17.56	18.10	17.65	17.76	17.48	16.14	15.57	14.98	14.48	14.39
Serious injuries*	107,996	108,282	105,520	101,560	93,774	91,611	92,042	89,611	89,476	84,508
Serious injury rate per 100M VMT	51.95	50.41	49.87	47.05	44.81	39.94	39.30	37.89	37.01	37.02
Serious injury rate per 100K Population	538.79	519.29	494.82	466.30	442.05	407.34	402.63	381.20	374.31	350.58

Notes *A level - Incapacitating and B level -non-incapacitating injuries.

Sources: The 1999 – 2001 fatality and injury data are from Texas Department of Public Safety, Texas Traffic Crash Database. The 2002-2006 fatality and injury data are from the TxDOT Crash Record Information System (CRIS) and were extracted and verified as of 03/26/09. The 2007 and 2008 data was extracted as of 08/30/09 and 09/03/09 respectively. Travel data are from the Texas Department of Transportation and population data are from Texas State Data Center.

Where We Would Like to Be

Although fatalities and serious injuries have declined since 1996, the general consensus among those involved in transportation safety is that further reductions are not only desirable, but feasible. Technological improvements in automobile and roadway engineering, enforcement methods, medical treatment and in educational processes suggest we have not reached the limits of our capabilities in reducing crashes and injuries. Strategic planning to enable these reductions, however, requires that a target goal be established. This is never an easy task because the goal must be practical enough to have the possibility of being achieved yet lofty enough to present a challenge to the transportation safety community. The target goal for Texas is 1.40 fatalities and 41.2 serious injuries per 100 million VMT by 2010.

In retrospect, the 2008 data makes it apparent that the goal for the reduction in serious injury rate was initially set too low. This goal was established based on crash data available at the time. Certainly, the goal established has been achieved and exceeded (see the Table 1). However, the goal for fatality rate increased slightly in 2008. This increase was directly related to a decrease in the vehicle miles traveled in 2008, which, in turn, was related to large fluctuations in fuel prices. However, the consensus of those safety professionals surveyed this year is that the statewide goals should be maintained. Revisions should be considered only after the crash data for the target year of 2010 is available for analysis.

Overall State Goal: 1.40 fatalities and 41.2 serious injuries per 100M VMT by 2010. Status: 1.48 fatalities and 37.0 serious injuries per 100M VMT in 2008.
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Updating the Strategic Plan

Several steps were undertaken to update the 2007 Texas SHSP. First, a Report of Progress for 2008 was prepared using new data available from CRIS. This report included crash data for the years 2002 through 2007. This allowed data for serious injuries and crashes for the base year of 2005 to be compared to the most recent year of data available (2007). Thus, it became possible to assess the “State of the State”, in terms of crashes, as it was in 2005 and to assess progress toward achieving the statewide goals and objectives established for each crash category.

Since the production of the Report of Progress, crash data for 2008 has become available and is included in this Report of Progress for 2009. In addition, the current plan also reflects the results of contributions from safety professionals and those interested in traffic safety from surveys and meetings arranged through Metropolitan Planning Organizations (MPOs) located in the Bryan, Houston-Galveston, San Antonio areas and the North Texas Council of Governments located in Arlington.

The participation by these groups was beneficial in ensuring that issue areas and countermeasures were comprehensive and in creating a “buy-in” from those members and organizations represented. The inclusiveness and collective ownership of the Plan and the networking fostered by the workshops may have been its greatest value.

The legislature also met in 2009. As a result of their deliberations, several bills that relate to traffic safety were passed and signed into law. These bills are discussed in the appropriate sections that follow.

RESULTS OF THE PLANNING PROCESS

Roadway Safety Emphasis Areas

Several key roadway safety issues emerged from the planning process. These safety issues have been grouped into four **Emphasis Areas**. These areas and the safety issues that have been grouped under them are presented in Figure 1. The use of Emphasis Areas simply provides a convenient way of presenting the issues and the countermeasures that follow.

Figure 1. Roadway Safety Emphasis Areas

<p>Crash Type & Location</p> <ul style="list-style-type: none"> ▪ Run-Off the Road ▪ Head-On ▪ Intersection ▪ Work Zone ▪ Railroad Grade Crossing 	<p>System Users</p> <ul style="list-style-type: none"> ▪ Older Drivers ▪ Teen Drivers ▪ Motorcyclist ▪ Bicyclists ▪ Pedestrians ▪ Large Trucks
<p>User Behavior</p> <ul style="list-style-type: none"> ▪ Driving Under the Influence (DUI)¹ ▪ Speeding ▪ Lack of Restraint Use ▪ Aggressive Driving ▪ Cell Phone Usage 	<p>System Administration</p> <ul style="list-style-type: none"> ▪ Traffic/Crash Records ▪ E 911 Reporting Systems ▪ Public Awareness ▪ Policy Maker Awareness

1. DUI, in this context, is used as a general term to include both driving while intoxicated (DWI) and driving under the influence (DUI) offenses.

Safety Issues, Objectives and Countermeasures

The following pages present a discussion of the safety issues in detail. Also presented are the crash reduction objectives for each area and potential countermeasures which may help to meet the objectives.

Four years of the most recent (2005-2008) Texas crash data were examined as a means of measuring progress toward achieving the objectives established for various crash categories in each Roadway Safety Emphasis Area. Since CRIS is a living database of crash records, the values obtained for crash categories are somewhat dependent on when extracts from the data are obtained. In the tables that follow, data reported for the years 2005-2006 were extracted using a closeout date of **03/26/2009**. Data for 2007 and 2008 were extracted as of **08/04/2009** and **09/03/2009** respectively. The Glossary of Data Definitions used to subset the crash data for each Emphasis Area is presented as Attachment 1.

CRASH TYPE AND LOCATION

Run-Off the Road (ROR) Crashes

The Issue:

Run-off the road (ROR) crashes account for over 30 percent of the annual fatalities and over 20 percent of the annual injuries. These casualties resulted primarily from hitting fixed objects and vehicles overturning. Prior data analysis suggests that, as with most crashes, unsafe speed and driving under the influence of alcohol and/or drugs were the dominant contributing factors. Further, vehicle overturning tends to occur in rural areas. In urban areas, where fewer vehicles overturn, they do so in the roadway rather than off the road. Fixed object crashes happen in both rural and large urban areas, with the rural crashes being in the majority.

Casualties and Crashes (2005 - 2008)

Run Off the Road	Fatalities	KAB Injuries	KAB Crashes
2005	1,332	24,864	19,455
2006	1,189	21,375	17,196
2007	1,203	21,816	17,559
2008	1,131	18,174	14,578
'08-'05 Difference	-201	-6,690	-4,877
Percent Change	-15.09	-26.91	-25.07

Objective:

Reduce the number of fatal and serious injury crashes involving roadway departures by 10% by 2010, as compared to 2005.

Progress:

The objective has been reached. However, consideration should be given to revising the objective for this emphasis area and countermeasure activity should continue.

Countermeasures:

- Increase DUI and speed enforcement as a means of reducing ROR crashes.
- Ensure that driver education and defensive driving curriculums include information concerning curves, curve warnings, and behaviors that lead to ROR crashes, such as; fatigue, distractions and overdriving curves.*
- Increase the use of paved shoulders on FM roads to increase the "forgiveness" of the road during road departures.
- Continue to install shoulder and centerline rumble strips.
- Provide progressive levels of treatment for curves based on crash experience. Treatments might include; increased use of chevron signs, use of speed activated curve warnings and LED curve displays, and textured pavement.
- Install more pavement width to allow edge lines.
- Use 30 degree slope or safety wedge for pavement edges to facilitate returning to the roadway.
- Continue to remove trees, relocate utility poles, and protect culverts or remediate risks by other means.
- Reduce EMS response time in rural areas. This could require increasing coverage and/or providing EMS training of volunteers.

Head-On Crashes

The Issue:

Head-on collisions account for over 17 percent of the annual fatalities and over 2 percent of the annual injuries. Head-on crashes occur when a vehicle is traveling the wrong way on a one-way route, when a vehicle attempts to pass without sufficient clearance on an undivided route, or when a driver loses control of a vehicle and crosses over into an opposing lane of oncoming traffic. It is highly likely most head-on collisions in recent years have been of the third type. FARS statistics indicate that most head-on crashes result from a motorist making an “unintentional” maneuver – the driver falls asleep, is distracted, or travels too fast in a curve. There may be other contributing factors, such as alcohol use or speeding. Head-on collisions described as *wrong side, not passing* involve vehicle-to-vehicle collisions and tend to occur in rural areas.

Casualties and Crashes (2005 - 2008)

Head On Crashes	Fatalities	KAB Injuries	KAB Crashes
2005	568	5,024	2,630
2006	592	4,734	2,507
2007	609	5,055	2,653
2008	512	4,238	2,280
'08-'05 Difference	-56	-786	-350
Percent Change	-9.86	-15.64	-13.31

Objective:

Reduce the number of fatal and serious injury Head On crashes by 10% by 2010, as compared to 2005.

Progress:

The reduction objective has been achieved. Head On crashes and casualties decreased greatly in 2008. Those crashes classified as Wrong Side, Not passing resulted in a decrease as well. Countermeasures should continue in this area.

Casualties and Crashes (2005 – 2008)

Wrong Side, Not Passing	Fatalities	KAB Injuries	KAB Crashes
2005	205	1,368	651
2006	245	1,288	633
2007	257	1,427	707
2008	195	1,202	591
'08-'05 Difference	-10	-166	-60
Percent Change	-4.88	-12.13	-9.22

Countermeasures:

- Install more concrete and cable median barriers.
- Increase the installation of centerline rumble strips.
- Widen roadways to increase control and recovery areas.
- Address “wrong-way” entrance onto freeways by seeking novel delineation treatments and by taking advantage of freeway monitoring technology to detect “wrong-way” drivers.

Intersection Crashes

The Issue:

Intersection and intersection-related crashes account for over 24 percent of the annual fatalities and over 30 percent of the annual injuries. Over 7 percent of these casualties resulted primarily from failure to yield the right of way. Past analysis indicate that intersection related *Failure to Yield* casualties occur in large urban areas, with about 25 percent occurring in rural and small urban areas.

Casualties and Crashes (2005 - 2008)

Intersection and Intersection Related Crashes	Fatalities	KAB Injuries	KAB Crashes
2005	769	40,049	27,784
2006	790	39,021	27,382
2007	840	38,843	27,301
2008	835	37,402	26,798
'08-'05 Difference	71	-1,206	-483
Percent Change	9.23	-3.01	-1.74

Objective:

Reduce the number of fatal and serious injury intersection-involved crashes by 10% in 2010, as compared to 2005.

Progress:

The reduction goal has not been achieved, although progress has been made. The casualties and crashes resulting from Failure to Yield at intersections have remained stable. Countermeasure activity should continue at a determined level.

Countermeasures:

- Implement engineering solutions to reduce red-light running, such as changes in signal timing (i.e., longer yellow, all-red phase, etc).
- Enhance advanced warning at intersections through the use of signing and textured pavements.
- Consider the use of roundabouts to reduce the number of serious crashes.
- Promote better access management polices and practices by educating consultants and developers on driveway regulations in relation to intersections and by coordinating with city, county and state engineers.
- Add more turn bays and acceleration lanes on high-speed rural roads.
- Eliminate limited sight distance on all roads. This includes high speed rural and urban intersections where sight distance limitations exist due to vegetation, signing and other obstructions.
- Expand the use of red-light cameras by municipalities.
- Add information on gap acceptance and intersection crash frequency to a standardized driver education curriculum and to programs targeting elderly drivers.
- Encourage the use of emergency vehicle signal preemption.

Work Zone Crashes

The Issue:

Work zone and work zone-related crashes result in less than 4 percent of the annual fatalities and less than 4 percent of the average annual serious injuries in 2005. AASHTO has identified work zone crashes as an emphasis area.

Casualties and Crashes (2005 - 2008)

Work Zone Crashes	Fatalities	KAB Injuries	KAB Crashes
2005	82	1,583	1,097
2006	147	3,798	2,752
2007	147	3,674	2,625
2008	176	3,588	2,622
'08-'05 Difference	94	2,005	1,525
Percent Change	114.63	126.66	139.02

Objective:

Reduce the number of fatal and serious injury crashes related to work zones by 10% by 2010, as compared to 2005.

Progress:

According to the data, the crash reduction goal has not been achieved. However, if the data from 2006 is used as a basis for comparison, a different picture emerges. Looking at the '06/'08, there is not the dramatic increase that is seen in the '05/'08 difference.

Casualties and Crashes (2006 - 2008)

Work Zone Crashes	Fatalities	KAB Injuries	KAB Crashes
2006	147	3,798	2,752
2007	147	3,674	2,625
2008	176	3,588	2,622
'06/'08 Difference	29	-210	-130
Percent Change	19.72	-5.53	-4.72

Countermeasure activity should definitely continue at a determined level. However, consideration should be given to measuring progress toward the 2010 goal using the crash data from 2006 as a baseline.

Countermeasures:

- Reduce the number, duration and impact of work zones.
- Improve work zone traffic control devices.
- Improve work zone design practices.
- Improve driver compliance with work zone traffic controls through the use of law enforcement officers trained in enforcement procedures in work zones.
- Create safe, efficient enforcement areas when planning a work zone.
- Increase knowledge and awareness of work zones.
- Develop procedures to effectively manage work zones.

Railroad Grade Crossing Crashes

The Issue:

Railroad grade crossing crashes are being addressed by closing those crossings that are unnecessary and by upgrading signals at crossings that experience significant increases in vehicle and train volumes.

Casualties and Crashes (2005 - 2008)

RR Grade Crossing	Fatalities	KAB Injuries	KAB Crashes
2005	28	305	238
2006	49	401	298
2007	49	368	275
2008	39	402	287
'08-'05 Difference	11	97	49
Percent Change	39.29	31.80	20.59

Objective:

Continue the current railroad grade crossing safety improvement program.

Progress:

Although the casualties and crashes at railroad grade crossings are relatively few in number, there have been increases in KAB crashes in 2007 when compared to the baseline year of 2005. There was no objective established for this category because of the ongoing program of eliminating and upgrading crossings. It is recommended that this program continues.

Countermeasures:

- Target high incident crossings for elimination or consolidation with other crossings.
- Continue to install warning lights and gates at public road grade crossings.
- Enhance passive crossing warnings with flashing lights and/or delineation posts for increased conspicuity and for channelization of traffic.
- Encourage signal preemption for intersection prior to rail grade crossings.
- Educate adult drivers and children on the dangers of at-grade railroad crossings.
- Continue to eliminate at-grade railroad crossings by construction of overpasses and underpasses where appropriate.
- Continue to complete corridor studies to identify candidate crossings for closure, consolidation or elimination.

SYSTEM USERS

Older Drivers

The Issue:

Crashes involving at least one driver who is 65 years of age or older result in over 12 percent of the annual fatalities and over 10 percent of the annual injuries. AASHTO has identified crashes involving older drivers as one of their emphasis areas.

Casualties and Crashes (2005 - 2008)

Drivers (65 and over)	Fatalities	KAB Injuries	KAB Crashes
2005	441	9,854	6,878
2006	421	9,709	6,884
2007	419	9,695	6,869
2008	421	9,510	6,747
'05/'08 Difference	-20	-344	-131
Percent Change	-4.54	-3.49	-1.90

Objective:

Reduce the number of fatal and serious injury crashes involving older drivers by 10% by 2010, as compared to 2005.

Progress:

The reduction goal has not been achieved although fatalities, serious injuries and KAB Crashes have all decreased. Countermeasure activity should continue at a determined level.

Countermeasures:

- Improve signing, modify traffic control devices and pavement markings to accommodate older drivers, e.g., provide shoulder rumble strips, wider striping, illuminated street name signs.
- Improve driving competency of older adults by offering training programs.
- Communicate driving and licensing issues and alternative transportation options to older drivers and family members. (This communication should also include law enforcement and medical personnel and include educational materials regarding potential driving problems associated with aging and how to recognize them.)
- Develop community mobility resource guide.
- Develop, implement and otherwise encourage public/private partnerships that provide transportation alternatives to the personal vehicle.
- Provide vouchers for alternative transportation options.
- Develop incentives for older drivers to adopt advanced vehicle technologies that could assist them with age-related driving problems, e.g., back-up warning devices.
- Improve links among driver records, vehicle registration information and physical/functional impairments and medical conditions affecting driving capability.

Teen Drivers

The Issue:

Drivers 19 and under represent about 6 percent of all licensed drivers in Texas but represent about 14 percent of the annual fatalities and 21 percent of the annual serious injuries. AASHTO and NHTSA have identified crashes involving young drivers as an emphasis area.

Casualties and Crashes (2005 - 2008)

Drivers (15-19 years of age)	Fatalities	KAB Injuries	KAB Crashes
2005	564	20,435	13,837
2006	536	19,251	13,167
2007	493	19,144	13,099
2008	481	17,432	12,003
'05/'08 Difference	-83	-3,003	-1,834
Percent Change	-14.72	-14.70	-13.25

Objective:

Reduce the number of fatal and serious injury crashes involving teen drivers by 10% by 2010, as compared to 2005.

Progress:

The crash reduction goal has been achieved. However, because new drivers are continually entering the system, countermeasure activity should continue.

Countermeasures:

- Increase enforcement of zero-tolerance alcohol laws for underage drivers. This would include filing DWI charges where appropriate instead of DUI charges.

- Increase enforcement of graduated driver license (GDL) restriction violations and consider making violations a primary offense.*
- ~~Require road test to obtain driver license for all prospective licensees.*~~ See Note 1.
- Evaluate the effectiveness of graduated licensing and alter as necessary, e.g., increase hours of nighttime driving restriction, require adult-supervised driving practice.
- Conduct teen driver education programs in schools and elsewhere, including state-supported novice driver education and traffic safety-related teen awareness programs.
- Develop and implement distracted driving public information and education (PI&E) messages targeted to teens.
- Develop and implement educational programs and PI&E messages for parents of novice drivers, e.g., appropriate vehicle selection for new drivers, information about young driver risks, behavioral considerations, etc.
- Develop means and methods for taking advantage of technological capabilities for external and in-vehicle surveillance and recording of vehicle information (speed, acceleration, hard braking, etc.), including incentives for voluntary use of "black box" devices for monitoring driving performance.
- Develop/implement programs that provide transportation options for teens in addition to personal vehicles.
- Move away from parent taught driver education and return to sanctioned, supervised programs.
- ~~Require road test to obtain initial driver's license for all prospective licensees under age 18.*~~ See Note 1.

Note 1. HB 2730 requires all applicants under 18 to take a driving skills test. And extends restrictions for GDL to one year.

Motorcyclist

The Issue:

The proportion of motorcyclists killed in traffic crashes compared to all traffic fatalities has more than tripled from 3.4 percent in 1997 to 15.3 percent in 2008. That proportion is likely to increase as motorcycle registrations in Texas continue to increase.

The motorcycle fatality and injury rates per 10,000 registered motorcycles have also increased.

Casualties and Crashes (2005 - 2008)

Motorcyclist	Fatalities	KAB Injuries	KAB Crashes
2005	362	5,698	5,239
2006	352	6,098	5,673
2007	410	6,157	5,698
2008	532	7,663	7,052
'05/'08 Difference	170	1,965	1,813
Percent Change	46.96	34.49	34.61

Objective:

Reduce the number of fatal and serious injury crashes involving motorcycles by 10% by 2010, as compared to 2005.

Progress

The crash reduction goal has not been achieved. In fact, KAB crashes have increased over time. This increase is disproportionate to the increase in motorcycle registrations. Countermeasures should continue at a determined level and additional countermeasures should be developed and implemented.

Countermeasures:

- Target enforcement on specific motorcycle/motorist behaviors.
- Increase reporting of alcohol involvement in motorcycle crashes.
- Train law enforcement in the detection of impaired riders.
- Develop educational programs for justice system personnel with regard to motorcycle laws.
- Increase participation in rider education and training programs.
- Enlist support of and participation in motorcycle safety initiatives by formal and informal motorcycle groups.
- Increase helmet and protective gear usage through education.
- Increase participation of EMS personnel in helmet use advocacy.
- Require the use of motorcycle helmets for all riders ~~and/or increase the current insurance threshold for helmet requirement exemption.~~ See Note 1.
- Create education programs that address specific unsafe behaviors of motorcyclists, including alcohol issues.
- Conduct PI&E campaigns and other educational programs to increase motorist awareness of motorcycles, including helmet requirements, awareness of motorcycle presence, safe driving practices around motorcyclists (e.g., following and stopping distances, passing technique, etc), and the unique characteristics of motorcycles such as braking and acceleration differences between motorcycles and four-wheel passenger vehicles.
- ~~Revise the motorcycle license law to require motorcycle operator training and safety courses.*~~ See Note 1

Note 1. SB 1967 requires new applicants for a class M license to take an approved training course and requires a minimum of \$10,000 of insurance to ride without a helmet.

Bicyclists

The Issue:

Crashes involving bicycles account for 1.4 percent of the annual fatalities and about 1.1 percent of the annual injuries. National trends show that the 14 years and under age group accounted for 18 percent of all bicycle-related fatalities and 29 percent of all bicycle-related injuries. Because of the number of bicycle riders and the predominance of young riders, NHTSA has several initiatives addressing bicycle safety.

Casualties and Crashes (2005 - 2008)

Bicyclist	Fatalities	KAB Injuries	KAB Crashes
2005	47	925	1,208
2006	49	8488	1,122
2007	50	942	1,192
2008	48	1,341	1,453
'05/'08 Difference	1	416	245
Percent Change	2.13	44.97	20.28

Objective:

Reduce the number of fatal and serious injury crashes involving bicycles by 10% by 2010, as compared to 2005.

Progress:

The crash reduction goal for this Emphasis Area has not been achieved. Countermeasures should continue at a determined level.

Countermeasures:

- Continue to support a comprehensive Safe Routes to School program.
- Integrate bicycles into transportation system (improve connectivity).
- Conduct PI&E campaigns on bicycle traffic laws and the use of bicycle safety equipment for both bicyclists and non-biking motorists.
- Increase enforcement of bicycle right-of-way traffic laws.
- Conduct bicycle training programs for school age children and adults using bicycles for both recreation and transportation.
- Increase motorist awareness of bicycles: "share the road".
- Increase participation of EMS personnel in helmet and other safety equipment use advocacy.
- Encourage local ordinances regarding bicycle helmet use.
- Encourage municipalities to pass vulnerable road user statutes.

Pedestrians

The Issue:

Pedestrian and motor vehicle-related crashes account for over 12 percent of the annual fatalities and about 3.2 percent of the annual serious injuries. A previous review of data and comments by safety professionals suggest that a number of these casualties occur in urban areas and involve speeding and impaired drivers. Information suggests that drinking pedestrians contribute to the events.

Casualties and Crashes (2005 - 2008)

Pedestrian	Fatalities	KAB Injuries	KAB Crashes
2005	443	2,877	2,958
2006	390	2,491	2,642
2007	417	2,832	2,979
2008	445	3,311	3,252
'05/'08 Difference	2	434	294
Percent Change	0.45	15.09	9.94

Objective:

Reduce the number of fatal and serious injury crashes involving pedestrians and motor vehicles in large urban areas by 10% by 2010, as compared to 2005.

Progress

The crash reduction goal has not been achieved.

Because of the vulnerable nature of pedestrians, consideration should be given to revising the objective to a 10 percent reduction in fatalities.

Countermeasures should continue at a determined level.

Countermeasures:

- Improve signals, signs and crosswalk markings at intersections.
- Improve pedestrian environments through traffic calming.
- Increase the number of sidewalks and walkways in rural and urban areas. Needs are especially great in and around ports of entry.
- Remove impediments to walking on existing sidewalks.
- Increase sight distance to and from intersections and increase lighting at intersections and crosswalks.
- Increase enforcement of pedestrian laws and public intoxication laws in urban and rural areas.
- Develop PI&E materials concerning pedestrian crashes and pedestrian and driver responsibilities, including appropriate actions following vehicle breakdowns.
- Implement programs for removing disabled vehicles and their occupants from limited access highways and extending hours, especially at night, of existing "courtesy patrol" programs.
- Develop programs to encourage safe walking rather than driving for appropriate trips.

Large Trucks

The Issue:

Crashes involving large trucks result in about 12 percent of the annual fatalities and about 5 percent of the annual injuries. Because of the stiffness, size and weight of large trucks, crashes that they are involved in tend to be severe. For this reason, AASHTO has designated heavy trucks as an emphasis area.

Casualties and Crashes (2005 - 2008)

Large Trucks	Fatalities	KAB Injuries	KAB Crashes
2005	347	2,772	1,972
2006	413	3,528	2,506
2007	437	4,157	3,015
2008	410	4,512	3,378
'05/'08 Difference	63	1,740	1,406
Percent Change	18.16	62.77	71.30

Objective:

Reduce the number of fatal and serious injury crashes involving large trucks by 10% by 2010, as compared to 2005.

Progress

The crash reduction goal has not been achieved. In fact, there has been an increase in fatalities and substantial increases in injuries and KAB crashes.

Countermeasures should continue at a determined level and new countermeasures should be developed and implemented.

Countermeasures:

- Increase enforcement of commercial (i.e., truck) motor vehicle speed limits.
- Reduce driver fatigue-related crashes by providing center and shoulder rumble strips and truck parking areas.
- Increase use of heavy truck lane restrictions and consider implementation of "truck only" lanes in areas identified as having very high commercial vehicle volumes during concentrated, typically nighttime, periods.
- Increase inspections of trucks for safety equipment and violations. Consider decreasing minimum jurisdiction size for conducting for Level 1 truck inspections.*
- Increase public knowledge about techniques for sharing the road with trucks and other vehicles.
- Conduct PI&E campaigns on heavy vehicle operational/performance limitations, rules, crash experience and restrictions.
- Coordinate with Department of Homeland Security (DHS) for funding inspection stations/manpower to staff.
- Create adequate storage for truck inspection stations in and around ports of entry.

*May require legislative action.

USER BEHAVIORS

Driving Under the Influence (DUI)

The Issue:

Crashes, in which at least one of the drivers was under the influence of alcohol or drugs, resulted in over 26 percent of the annual fatalities and 10 percent of the annual injuries. This contributing factor is found in all crash types and locations. Previous analysis suggests that over 43 percent of the casualties occur in large urban areas and over 49 percent on rural roads.

Casualties and Crashes (2005 - 2008)

DUI	Fatalities	KAB Injuries	KAB Crashes
2005	848	11,544	8,095
2006	1,020	11,661	8,318
2007	1,087	11,871	8,437
2008	1,124	11,641	8,362
'05/'08 Difference	276	97	267
Percent Change	32.55	0.84	3.30

Objective:

Reduce the number of fatal and serious injury DUI-involved crashes by 10% by 2010, as compared to 2005.

Progress

The crash reduction goal for this Emphasis Area has not been achieved. DUI fatalities have increase over 32 percent.

Although many bills were introduced in the 2009 Legislative session, only one of significance passed. See Note 1.

Countermeasures should continue at a determined level. However, it should be understood that as BAC reporting improves, future crash data may not be comparable to current data.

Countermeasures:

- Continue to use Selective Traffic Enforcement Programs (STEPS) to deter drunk driving.
- Consider tougher penalties for drivers convicted of having blood alcohol concentrations of 0.15 or greater, if research demonstrates that such penalties do not adversely effect sentencing.*
- Limit the ability of drivers charged with DWI/DUI to plea bargain the charge down to a lesser offense.*
- Increase training and the use of new technology to reduce DUI processing time of suspects.
- Increase enforcement of vehicle confiscation law.
- Increase enforcement of Zero Tolerance laws for underage drivers.
- Continue PI&E campaigns to encourage people not to drive impaired.
- Develop bilingual, culturally appropriate, materials for anti-DUI campaigns.
- Educate judges and prosecutors concerning DUI laws.
- Promote alcohol screening in trauma centers and emergency rooms.
- Require all drivers involved in fatal crashes to be tested for alcohol use.*
- Establish minimum sentencing for DWI/DUI offenses.

- Re-evaluate, strengthen and create uniform enforcement of administrative license revocation (ALR) law.*
- Encourage expansion of DWI courts as a viable track for offenders.
- Improve BAC reporting through breath and/or blood testing.
- Warrants should be used to obtain evidence when breath or blood tests are refused.*
- Increase the use of interlock devices as a condition of bond for DUI, intoxicated assault and intoxicated manslaughter.
- Explore ways to make DUI offenders less anonymous (zebra plates, public service appearances, etc).
- Educate legislators in regards to the financial burden and human impact of DWI/DUI.
- Develop, implement and maintain effective designated driver campaigns and programs (demonstrations and sustained).
- Develop and implement programs that provide rapid response for DWI/DUI reported by citizens. A dedicated phone number for reporting would be useful.
- Explore issues related to implementing sobriety check points.

Note 1. HB 2730 increase the penalties for driving while intoxicated with a child passenger by adding an automatic license suspension.

* May require legislative action

Speed Related - (Over Limit, Unsafe Speed or Failure to Control Speed)

The Issue:

Crashes in which at least one of the drivers was exceeding the speed limit or driving at an unsafe speed resulted in over 36 percent of the annual fatalities and over 30 percent of the annual injuries. This contributing factor is also found in all crash types and locations. Prior analysis suggests that about 43 percent of the speed related casualties occur in large urban areas and over 45 percent on rural roads.

Casualties and Crashes (2005 - 2008)

Speed Related	Fatalities	KAB Injuries	KAB Crashes
2005	1,373	32,209	23,178
2006	1,476	31,885	23,081
2007	1,353	32,452	23,809
2008	1,454	30,249	22,375
'05/'08 Difference	81	-1,960	-803
Percent Change	5.90	-6.09	-3.46

Objective:

Reduce the number of fatal and serious injury speed-related crashes by 10% by 2010, as compared to 2005.

Progress

Although there has been a reduction in KAB crashes, the objective for this Emphasis Area has not been achieved.

Countermeasure activity should continue at a determined level.

Countermeasures:

- Reevaluate speed limits on roads with poor geometrics.
- Continue to use STEPs to deter speeding.
- Increase the use of CMV truck lane restrictions and truck only lanes.
- Require tougher penalties for excessive speeding (e.g., 20% or more above the limit) and in special corridors. Earmark a portion of the fines collected for state and local safety initiatives.*
- Dedicate a portion of citation revenue back to enforcement efforts (like STEP programs) and other state and local traffic safety initiatives.
- Encourage the use of speed activated feedback or warning signs to increase compliance with speed limits.
- Develop and implement PI&E campaigns targeting speed and speed-related behaviors (adjusting speed according to conditions, use the left lane for passing only, etc.).
- Use minimally marked enforcement vehicles to enforce speed laws.
- Encourage insurance companies to provide incentives to discourage speeding among their clients
- Encourage the addition of learning modules to driver education curriculums to address safe speed selection according to conditions.
- Continue speed enforcement in school and work zones.
- Encourage the use of traffic calming (roundabouts, bumps, striping, etc.) in low speed urban and rural areas.

* May require legislative action.

Lack of Restraint Use

The Issue:

Although the observed safety belt use rate for drivers and front seat passengers in Texas is over 90 percent, unrestrained occupants represent over 40 percent of the annual fatalities and over 15 percent of the annual injuries.

Casualties and Crashes (2005 - 2008)

Unrestrained	Fatalities	KAB Injuries	KAB Crashes
2005	1,602	16,643	N/A
2006	1,502	14,820	N/A
2007	1,442	14,305	N/A
2008	1,551	14,857	N/A
'05/'08 Difference	-51	-2,338	N/A
Percent Change	-3.18	-10.73	N/A

Objective:

Reduce the number of fatalities and serious injuries involving unrestrained drivers and/or occupants by 10% by 2010, as compared to 2005.

Progress

The casualty reduction goal for unrestrained people in crashes has been achieved and exceeded. Unrestrained passengers reduced their KAB casualties by over 27 percent and drivers by over 0.5 percent.

Countermeasures should continue for this Emphasis area.

Countermeasures:

- Continue to use STEPs to increase occupant restraint use.

- Increase penalties for occupant protection violations.*
- Continue public information and education (PI&E) campaigns to encourage occupant restraint use giving special attention to low use population sub-groups.
- Increase the quantity of bilingual educational materials for safety belt and child seat campaigns.
- Promote community child seat checkup events and establish permanent checkpoints in local areas.
- ~~Require safety belts and child safety seats for all seating locations.~~ *See Note 1.
- ~~Require the use of booster seats for older children.~~ *See Note 1.
- Encourage hospitals to ensure children are properly restrained before they are discharged.
- Encourage and/or increase educational efforts focused on pre-drivers (school programs, roll-over convickers, etc.).
- Develop strategies to address nighttime belt use.
- Develop PI&E materials with better instructions for child and booster seat installation.
- Make non-use of safety belts and child seats a moving violation in Texas to encourage perennial non-users to buckle-up*

Note 1. HB 537 requires all occupants to be properly restrained. SB 61 requires that children under 8 years to be in a booster seat unless they are at least 4 foot 9 inches tall.

*May require legislative action.

Aggressive Driving

The Issue:

NHTSA has defined aggressive driving as a combination of moving traffic offenses that endanger other drivers or property. Crashes related to aggressive driving generally involve combinations of contributing factors such as speeding, reckless driving, following too close, illegal lane changes, etc. At present, the Texas crash data system does not record reckless driving as a contributing factor and many of the others may not be recorded. Consequently, crashes involving aggressive drivers are difficult to identify. However, both NHTSA and AASHTO have initiatives addressing aggressive driving behavior. For analysis purposes aggressive driving has been defined as per the contributing factors in the Glossary in Attachment 1. It is likely that this definition will be modified in the future as more is learned about this behavior.

Casualties and Crashes (2005 - 2008)

Aggressive Driving	Fatalities	KAB Injuries	KAB Crashes
2005	42	542	352
2006	45	619	400
2007	36	556	365
2008	27	487	324
'05/'08 Difference	-15	-55	-28
Percent Change	-35.71	-10.15	-7.95

Objective:

Develop a baseline for the number of fatal and serious injury crashes involving aggressive driving and reduce the number by 3% by 2010, as compared to 2005.

Progress

A baseline for aggressive driving has been established using a limited definition. Although this definition may change in the future, it represents an initial attempt to satisfy the objective. Using the current definition, the established objective has been achieved.

Countermeasures should continue. Consideration should be given to refining the definition and objective for this Emphasis Area.

Countermeasures:

- Define aggressive driving for purposes of classifying crashes.
- Ensure data systems can accurately capture aggressive driving as a specific safety issue.
- Educate pre-drivers and those participating in defensive driving about aggressive driving and how to deal with such behavior.
- Develop or access technology that can use vehicle data recording devices to capture aggressive driving activities of individual drivers.
- Train law enforcement to recognize aggressive driving behaviors.
- Increase high visibility enforcement.
- Increase coordinated enforcement of aggressive driving.
- Enhance penalties for aggressive driving.*
- Conduct PI&E campaigns about aggressive driving and basic tips for dealing with an aggressive driver.
- Educate aggressive drivers to remediate behaviors.

*May require legislative action.

Cell Phone Usage

The Issue:

Cell phone usage, as a distraction, has been given as a contributing factor in crashes in a number of research studies sponsored by the NHTSA. The issue seems to be related to the distraction posed by involved conversations rather than by the act of dialing. Currently, Texas has cell phone usage as a contributing factor on its crash report form. However, there is little or no automated crash data available after this factor was added.

Objective:

Determine the relationship between cell phone use and crashes. If a direct relationship exists, reduce the incidence of cell phone use by drivers by 25% by 2010 as compared to 2008.

Progress

There has been a great deal of work at the national level that supports the relationship between cell phone use and crashes.

Legislation was introduced in an attempt to impose restrictions on cell use by certain segments of drivers and at certain times. See Note 1 for legislation that passed in 2009.

At present, there is no data of cell phone usage that could be used to evaluate the objective and the effectiveness of legislation that might be passed.

It is recommended that the countermeasures be implemented and continued.

Countermeasures:

- Train police officers to investigate and record cell phone usage as a contributing crash factor.
- Develop a baseline for crashes related to cell phone use (voice or text messaging).

- Develop and disseminate educational materials to raise the awareness of the risks of cell phone use and driving.
- Institute penalties for drivers using cell phones while vehicle is moving.* (See Note 1.)

Note 1. HB 55 makes it illegal to use a cell phone in a school zone unless the vehicle is stopped or the device is hands free. Communities must post a sign for the law to be in effect. HB 2730 prohibits the use of wireless devices by GDL holders.

*May require legislative action.

SYSTEM ADMINISTRATION GENERAL

Issues addressed in this Emphasis Area are indirectly related to crashes. They primarily deal with information intended to improve the safety of the highway system. It is a rare occurrence where specific crash data can be called upon to evaluate the effectiveness of the information required for the highway system to operate. Rather, success is usually measured in terms of overall crash reductions system wide. Because, it is often difficult, if not impossible, to evaluate the benefit of information in effecting safety improvements using crash data, logic, common sense and experience must be used to establish the beneficial nature of the relationship.

In the following sections, crash data are not used as evidence of a need for safety improvements. Rather, the need for the information and its potential benefit should be apparent from the relationship of that information to the safe operation of the highway system.

Traffic/Crash Records

The Issue:

Crash records are essential for identifying problems, developing and evaluating countermeasures and assessing the state and progress of the highway system. Currently, the Texas crash data system is in the process of being improved and updated. The new system, called the Crash Records Information System (CRIS), has reached the point where past and recent crash data is now available.

Objective:

Produce timely, accurate and reliable crash data for Texas by 2008.

Progress

Crash data for the last 5 years and the current year is available from CRIS.

Recommendations:

- Supplement crash records with public health records (e.g., hospital discharge records) to obtain a clearer picture of the true societal costs of traffic crashes. The Texas Crash Outcome Data Evaluation System (CODES) project might serve as a model for such a records system.

E911 Reporting Systems

The Issue:

Texas has been slow to deploy Enhanced 911 (E911) systems that allow Public Safety Answering Points to identify the location of someone making an emergency call on a cell phone. Because such cell phone calls are often made from the scene of traffic crashes, the absence of widespread E911 capabilities is a serious roadway safety issue. Money is available to implement E911 more widely but is not being spent by the state.

Objective:

Provide Phase II Enhanced 911 (E911) wireless services in all Texas counties by 2010.

Progress

The number of services that have implemented E911 systems is unknown at this time. Data should be gathered from the appropriate agency so that progress can be evaluated.

Recommendations:

- The emergency medical services community should take the lead in pressing for the expenditure of already available funds to increase deployment of E911 systems in Texas.

Public Awareness

The Issue:

Most drivers are unaware of the magnitude of the crash losses that occur or cannot interpret how those losses affect them directly. Further, the driving task has become so routine and comfortable that drivers give little thought to the risks associated with the activity. And, in truth, the risks are generally small. However, within the safety community, it is well known that certain behaviors dramatically increase one or both aspects of risk; probability and/or severity of crash involvement.

Objective:

Reduce public tolerance for crash risks and losses and increase demand for and support of crash reduction countermeasures.

Progress:

Work continues in raising public awareness of traffic safety issues and problems. Through the Traffic Safety Program in TxDOT, there have been extensive public information and education (PI&E) efforts in motorcycle safety, anti-DWI, safety belts and other areas. TxDOT was also a co-sponsor of a traffic safety conference held in 2008. Efforts to educate the public about traffic safety issues should continue.

Recommendations:

- Announce forecasts of traffic casualties before holiday weekends.
- Work on the development of a “safety culture,” as has been done in Europe and Australia (with resultant dramatic reductions in traffic crashes)
- Involve Chambers of Commerce in identifying and addressing crash-prone traffic corridors.

Policy Maker Awareness

The Issue:

Policy makers at all levels need to be made aware of the magnitude of the losses resulting from traffic crashes and of the emotional and economic burden created by those losses. Awareness, hopefully, will lead to informed legislative and policy actions that support highway safety initiatives.

It is particularly important that policy makers with sufficient understanding of roadway safety issues appoint municipal judges, whose courts are the primary venue for traffic-related cases, consistent with setting the appropriate tone for traffic law offense adjudication.

Similarly, with regard to policy makers who hire/appoint local police chiefs, it is important that the positions are filled with individuals who recognize and reflect the higher level policy makers’ interest in and knowledge of roadway safety.

Objectives:

Increase policymaker awareness of roadway safety issues including; individual and societal losses due to crashes, the importance of legislative and public support for highway safety initiatives and the need for a “cultural change” in driving behavior.

Progress:

Since 2009 was a legislative year, members of many organizations concerned with traffic safety provided information to legislators or members of their staff or testified before various committees. Efforts to educate policy makers about traffic safety issues should continue.

Recommendations:

- Develop approaches/methods and support for disseminating information to policy makers, e.g. central dedicated web sites.

FUTURE PLANNING

Iterative Planning

This Plan represents the most recent step in the iterative process of focusing attention on transportation safety issues in the state. It considered and incorporated regional and local safety interests and encouraged the development of regional and local traffic safety interest groups. It is hoped that such groups will use the SHSP to develop detailed plans that will identify safety issues, countermeasures, and implementation plans for their respective area. Further, it is hoped that future SHSP efforts will be able to draw heavily upon these plans.

Evaluation

The Plan furthers the planning process by considering regional and local issues and by getting having regional and local organizations and others interested in traffic safety evaluate the approach used for developing the Plan. An overall evaluation of the planning process will be conducted in 2010. The results of this evaluation will be included in the post target year assessment. Likewise, an evaluation of the extent to which crash reduction objectives and statewide crash reduction goals were achieved will be included.

Finally, the planning process identified countermeasure efforts that, if implemented in strength, were thought to have potential for reducing crash experience. These anticipated crash reductions were directly related to goals established. An administrative evaluation will be conducted to assess efforts in countermeasure implementation.

Future of the Strategic Planning Process

The culmination of the three levels of evaluation will provide the basis for an improved process for future Strategic Highway Safety Plans. It is anticipated that, should the planning process continue, crash data will be more readily available and current. Such data can be analyzed to better establish countermeasure emphasis areas and program goals.

Data Source and Glossary

Data Sources

All crash and casualty data in this document originate from Texas police crash reports as coded in the Texas Crash Record Information System (CRIS). Previous iterations of the Strategic Highway Safety Plan reported data from the Texas Accident File – the Texas crash reporting system that preceded CRIS. The 2005 - 2007 data reported in the present document include crashes and casualties coded in CRIS as of August 4, 2009. Because crash and casualty frequencies based on crash type and specific driver classifications and/or driver behaviors are dependent on how each of those categories is defined and the specific data codes used, definitions of the pertinent variables employed are provided here. With the exception of “Lack of Restraint Use,” for which only deaths and injuries are reported, the frequency of both crashes and casualties resulting from crashes are reported in the SHSP. The definitions provided below are stated in terms of crashes. Casualties reported in the SHSP related to the crashes include deaths and injuries to all persons involved in a given crash type.

Glossary		
Term	Definition	CRIS Data Codes
Crash Type and Location		
Run Off the Road Crash - All	A single vehicle crash where the impact of the first harmful event occurred on the shoulder, beyond the shoulder or in the median of the roadway.	ROAD_RELAT_ID VALUES = 2 - Off Roadway, or 3 - Shoulder, or 4 - Median
Run Off the Road Crash - Hit Fixed Object	A single vehicle crash where the impact of the first harmful event occurred on the shoulder, beyond the shoulder or in the median of the roadway and which resulted from hitting a fixed object.	ROAD_RELAT_ID VALUES = 2 - Off Roadway, or 3 - Shoulder, or 4 - Median, and HARM_EVNT_ID = 7 - Fixed Object
Run Off the Road Crash - Overturned	A single vehicle crash where the impact of the first harmful event occurred on the shoulder, beyond the shoulder or in the median of the roadway and which resulted in the vehicle overturning.	ROAD_RELAT_ID VALUES = 2 - Off Roadway, or 3 - Shoulder, or 4 - Median, and

Glossary		
Term	Definition	CRIS Data Codes
		HARM_EVNT_ID = 10 - Overturned
Head On Crash - All	A crash involving two vehicles going straight that were traveling in opposite directions prior to impact.	COLLSN_ID = 30 - OD Both Going Straight
Head On Crash - Wrong Side, Not Passing	A crash involving two vehicles going straight that were traveling in opposite directions prior to impact. One of vehicles was on the wrong side of the roadway, but was not passing.	COLLSN_ID = 30 - OD Both Going Straight, and CONTRIB_FACTR_ID = 70- Wrong Side - Not Passing
Intersection and Intersection Related Crash - All	A crash in which the first harmful event occurred on an approach to or exit from an intersection and resulted from an activity, behavior or control related to the movement of traffic units through the intersection	INTRST_RELAT_ID = 1 - Intersection, or 2 - Intersection Related
Intersection and Intersection Related Crash - Failure to Yield Right of Way	A crash in which the first harmful event occurred on an approach to or exit from an intersection and resulted from an activity, behavior or control related to the movement of traffic units through the intersection and in which at least one vehicle failed to yield right of way.	INTRST_RELAT_ID = 1 - Intersection, or 2 - Intersection Related), and CONTRIB_FACTR_ID = 32 - Failed To Yield Row – Emergency Vehicle, or 33 - Failed To Yield Row – Open Intersection, or 35 - Failed To Yield Row – Stop Sign, or 36 - Failed To Yield Row – To Pedestrian, or 37 - Failed To Yield Row – Turning Left, or 38 - Failed To Yield Row – Turn On Red, or 39 - Failed To Yield Row – Yield Sign
Work Zone Crash	A crash in a construction zone or other maintenance area, whether or not it was construction related.	CRASH ROAD CONSTRUCTION ZONE FLAG_ID = Y, or CRASH ROAD CONSTRUCTION ZONE WORKER FLAG_ID = Y, or

Glossary		
Term	Definition	CRIS Data Codes
		OTHR_FACTR = 49 - Construction Zone - Not Construction Related), or 50 - Construction Zone - Construction Related, or 51 - Other Maintenance Area - Not Construction Related, or 52 - Other Maintenance Area - Construction Related
Railroad Grade Crossing Crash	A crash at an at-grade railroad/highway crossing, whether or not a train was involved.	CRASH RAILROAD RELATED FLAG ID = Y, or HARM_EVNT = 3 - RR Train, or Physical Feature = 17, or OBJECT STRUCK = 10 - Hit Train Moving Forward) , or 11 - Hit Train Backing), or 12 - Hit Train Standing Still, or 13 - Hit Train-Action Unknown, or 24 - Hit Railroad Signal Pole or Post, or 25 - Hit Railroad Crossing Gates
System Users		
Older Driver Crash	A crash involving at least one driver age 65 or older.	Drivers Age GE 65
Teen Driver Crash	A crash involving at least one driver 15 – 19 years of age.	Drivers Age GE 15 and LE 19
Motorcyclist Crash	A crash involving at least one motorcycle, motor scooter or motor assisted bicycle. Casualties related to motorcyclist crashes are reported for motorcycle operators and passengers only.	VEH_BODY_STYLE_ID = 71 - Motorcycle, or 72 - Moped, or 74 - Motorscooter, or 90 - Motorcycle Police, or VEH_TYPE_ID =

Glossary		
Term	Definition	CRIS Data Codes
		13 - Motorcycle, or 14 - Motorscooter, or Motorbike, or 16 - Motor Assisted Bicycle (Moped), or 18 - Motorcycle Police, or PERSN_TYPE_ID = 3 - Driver Of Motorcycle Type Vehicle, or 5 - Passenger On Motorcycle Type Vehicle
Bicyclist Crash	A crash involving at least one bicycle and one motor vehicle. Casualties related to bicyclist crashes are reported for bicyclists only.	HARM_EVNT_ID = 5 - Pedalcyclist, or PERSN_TYPE_ID = 7 - Pedalcyclist
Pedestrian Crash	A crash involving at least one pedestrian and one motor vehicle. Casualties related to pedestrian crashes are reported for pedestrians only.	HARM_EVNT_ID = 1 - Pedestrian, or PERSN_TYPE_ID = 6 - Pedestrian
Large Truck Crash (formerly Commercial Driver Crash)	A crash involving at least one large truck, defined as a truck tractor or semi-trailer.	VEH_TYPE_ID = 6 - Semi-Trailer, or 24 - Truck-Tractor)
<i>User Behavior</i>		
Driving Under the Influence (DUI) of Alcohol or Drugs Crash	A crash involving at least one driver under the influence of alcohol or other drug.	CONTRIB_FACTR_ID = 67 - Under Influence – Alcohol, or 45 - Had Been Drinking, or 68 - Under Influence – Drug, or 62 - Taking Medication, or DRIVER BAC TEST RESULTS > 0, or DRIVER SUBSTANCE TEST RESULT = - Positive
Speeding Related Crash	A crash in which at least one driver was speeding	CONTRIB_FACTR_ID = 22 - Failed To Control Speed, or

Glossary		
Term	Definition	CRIS Data Codes
	above the limit or driving at an unsafe speed below the limit.	60 - Speeding - Unsafe (Under Limit), or 61 - Speeding - (Over limit)
Lack of Restraint Use – Unrestrained Casualty	An injury or death to a vehicle driver or occupant involved in any crash who was not restrained	REST_ID = 8 - None
Aggressive Driving Crash	A crash in which “Road Rage” was identified as a contributing factor or a crash in which two or more contributing factors associated with aggressive driving are reported.	CONTRIB_FACTR_ID = 73 - Road Rage or, any two of the following: 4 - Changed Lane When Unsafe 44 - Followed Too Closely 53 - Overtake And Pass Insufficient Clearance 57 - Passed In No Passing Lane 58 - Passed On Right Shoulder 61 - Speeding - (Overlimit)

Crash Type and Location	
<i>Run-Off the Road (ROR) Crashes Crashes with Fixed Objects Rollover Crashes</i>	
Engineering	<ul style="list-style-type: none"> ▪ Increase the use of paved shoulders on FM roads to increase the “forgiveness” of the road during inadvertent lane departures. ▪ Continue to install shoulder and centerline rumble strips. ▪ Provide progressive levels of treatment for curves based on crash experience. Treatments might include; increase use of chevron signs, use of speed activated curve warnings and LED curve displays, and textured pavement. ▪ Install more pavement width to allow edge lines. ▪ Use 30 degree slope or Safety Wedge for pavement edges to facilitate returning to the roadway. ▪ Continue to remove trees, relocate utility poles, and protect culverts or remediate risks by other means.
Enforcement	<ul style="list-style-type: none"> ▪ Increase DUI and speed enforcement as a means of reducing run-off the road crashes.
Education	<ul style="list-style-type: none"> ▪ Ensure that driver education and defensive driving curriculums include information concerning curves, curve warnings, and behaviors that lead to ROR crashes, such as fatigue, distractions and overdriving curves.*
EMS	<ul style="list-style-type: none"> ▪ Reduce EMS response time in rural areas. This could require increasing coverage and/or providing EMS training of volunteers.
<i>Head-On Crashes Wrong Side-Not Passing</i>	
Engineering	<ul style="list-style-type: none"> ▪ Install more concrete and cable median barriers. ▪ Increase the installation of centerline rumble strips. ▪ Widen roadways to increase control and recovery areas. ▪ Address “wrong-way” entrance onto freeways by seeking novel delineation treatments and by taking advantage of freeway monitoring technology to detect “wrong-way” drivers.
<i>Intersection Crashes (Fail to Yield Right of Way)</i>	
Engineering	<ul style="list-style-type: none"> ▪ Consider the use of roundabouts to reduce the number of serious crashes. ▪ Implement engineering solutions to reduce red-light running, such as changes in signal timing (i.e., longer yellow, all-red phase, etc.). ▪ Eliminate limited sight distance on all roads. This includes high speed rural intersection and urban intersection where there are sight distance limitations due to vegetation, signing and other obstructions. ▪ Add more turn bays and acceleration lanes on high-speed rural roads. ▪ Enhance advanced warning at intersections through the use of signing and textured pavements.

* May require legislative action

Attachment 2

Crash Type and Location	
Enforcement	<ul style="list-style-type: none"> ▪ Expand the use of red-light cameras by municipalities.
Education	<ul style="list-style-type: none"> ▪ Promote better access management polices and practices by educating consultants and developers on driveway regulation with regard to intersections and by coordinating driveway regulation among city, county and state engineers. ▪ Add information on gap acceptance and intersection crash frequency to a standardized driver education curriculum and to programs targeting elderly drivers.
EMS	<ul style="list-style-type: none"> ▪ Encourage the use of emergency vehicle signal preemption.
<i>Work Zones</i>	
Engineering	<ul style="list-style-type: none"> ▪ Reduce the number, duration, and impact of work zones. ▪ Improve work zone traffic control devices. ▪ Improve work zone design practices.
Enforcement	<ul style="list-style-type: none"> ▪ Improve driver compliance with work zone traffic controls through the use of law enforcement officers trained in enforcement procedures in work zones. ▪ Create safe, efficient enforcement areas when planning a work zone.
Education	<ul style="list-style-type: none"> ▪ Increase knowledge and awareness of work zones. ▪ Develop procedures to effectively manage work zones.
<i>Rail/Highway Safety</i>	
Engineering	<ul style="list-style-type: none"> ▪ Target high incident crossings for elimination or consolidation with other crossings. ▪ Continue to install warning lights and gates at public road grade crossings. ▪ Enhance passive crossing warnings with flashing lights and/or delineation posts for increased conspicuity and for channelization of traffic. ▪ Encourage signal preemption for intersection prior to rail grade crossings. ▪ Continue to eliminate at-grade railroad crossings by construction of overpasses and underpasses where appropriate. ▪ Continue to complete corridor studies to identify candidate crossings for closure, consolidation or elimination.
Education	<ul style="list-style-type: none"> ▪ Educate adult drivers and children on the dangers of at-grade railroad crossings.

System User	
<i>Older Drivers</i>	
Engineering	<ul style="list-style-type: none"> ▪ Improve signing, modify traffic control devices and pavement markings to accommodate older drivers, e.g., provide shoulder rumble strips, wider striping, illuminated street name signs.
Education	<ul style="list-style-type: none"> ▪ Improve driving competency of older adults by offering training programs. ▪ Communicate driving and licensing issues and alternative transportation options to older drivers and family members. (This communication should also include law enforcement and medical personnel and include educational materials regarding potential driving problems associated with aging and how to recognize them.) ▪ Develop community mobility resource guide.
Public Policy and Other	<ul style="list-style-type: none"> ▪ Develop, implement and otherwise encourage public/private partnerships that provide transportation alternatives to the personal vehicle. ▪ Provide vouchers for alternative transportation options. ▪ Develop incentives for older drivers to adopt advanced vehicle technologies that could assist them with age-related driving problems, e.g., back-up warning devices. ▪ Improve links among driver records, vehicle registration information and physical/functional impairments and medical conditions affecting driving capability.
<i>Teen Drivers</i>	
Engineering	<ul style="list-style-type: none"> ▪ Develop means and methods for taking advantage of technological capabilities for external and in-vehicle surveillance and recording of vehicle information (speed, acceleration, hard braking, etc.), including incentives for voluntary use of "black box" devices for monitoring driving performance.
Enforcement	<ul style="list-style-type: none"> ▪ Increase enforcement of zero-tolerance alcohol laws for underage drivers. This would include filing DWI charges where appropriate instead of DUI by minor charges. ▪ Increase enforcement of graduated driver license (GDL) restriction violations and consider making violations a primary offense.*
Education	<ul style="list-style-type: none"> ▪ Conduct teen driver education programs in schools and elsewhere, including state-supported novice driver education and traffic safety-related teen awareness programs. ▪ Develop and implement distracted driving public information and education (PI&E) messages targeted to teens. ▪ Develop and implement educational programs and PI&E messages for parents of novice drivers, e.g., appropriate vehicle selection for new drivers, information about young driver risks, behavioral considerations, etc. ▪ Move away from parent taught driver education and return to sanctioned, supervised programs.*

* May require legislative action

System User	
Public Policy and Other	<ul style="list-style-type: none"> ▪ Evaluate the effectiveness of graduated licensing and alter as necessary, e.g., increase hours of nighttime driving restriction, require adult-supervised driving practice*.
<i>Motorcyclists</i>	
Enforcement	<ul style="list-style-type: none"> ▪ Target enforcement on specific motorcycle/motorist behaviors. ▪ Increase reporting of alcohol involvement in motorcycle crashes.
Education	<ul style="list-style-type: none"> ▪ Train police officers in the detection of impaired riders. ▪ Increase helmet and protective gear usage through education. ▪ Create education programs that address specific unsafe behaviors of motorcyclists, including alcohol issues. ▪ Conduct PI&E campaigns to increase motorist awareness of motorcycles, including helmet requirements, awareness of motorcycle presence, safe driving practices around motorcyclists (e.g., following and stopping distances, passing technique, etc), and the unique characteristics of motorcycles such as braking and acceleration differences between motorcycles and four-wheel passenger vehicles. ▪ Increase participation in rider education and training programs. ▪ Develop educational programs for justice system personnel with regard to motorcycle laws.
EMS	<ul style="list-style-type: none"> ▪ Increase participation of EMS personnel in helmet use advocacy.
Public Policy and Other	<ul style="list-style-type: none"> ▪ Require the use of motorcycle helmets for all riders.* ▪ Enlist support of and participation in motorcycle safety initiatives by formal and informal motorcycle groups,
<i>Bicyclists</i>	
Engineering	<ul style="list-style-type: none"> ▪ Continue to support a comprehensive Safe Routes to School program. ▪ Integrate bicycles into the transportation system (improve connectivity).
Enforcement	<ul style="list-style-type: none"> ▪ Increase enforcement of bicycle right-of-way traffic laws.
Education	<ul style="list-style-type: none"> ▪ Conduct bicycle training programs for school age children and adults using bicycles for both recreation and transportation. ▪ Increase motorist awareness of bicycles: “share the road”. ▪ Conduct PI&E campaigns on bicycle traffic laws and the use of bicycle safety equipment for both bicyclists and non-biking motorists.
EMS	<ul style="list-style-type: none"> ▪ Increase participation of EMS personnel in helmet and other safety equipment use advocacy.
Public Policy and Other	<ul style="list-style-type: none"> ▪ Encourage local ordinances regarding bicycle helmet use. ▪ Encourage municipalities to pas vulnerable road user statues.

*May require legislative action

System User	
<i>Pedestrians</i>	
Engineering	<ul style="list-style-type: none"> ▪ Improve signals, signs and crosswalk markings at intersections. ▪ Improve pedestrian environments through traffic calming. ▪ Increase the number of sidewalks and walkways in rural and urban areas. Needs are especially great in and around ports of entry. ▪ Remove impediments to walking on existing sidewalks. ▪ Increase sight distance to and from intersections and increase lighting at intersections and crosswalks.
Enforcement	<ul style="list-style-type: none"> ▪ Increase enforcement of pedestrian laws and public intoxication laws in urban and rural areas.
Education	<ul style="list-style-type: none"> ▪ Develop PI&E materials concerning pedestrian crashes and pedestrian and driver responsibilities, including appropriate actions following vehicle breakdowns. ▪ Develop programs to encourage safe walking rather than driving for appropriate trips.
Public Policy and Other	<ul style="list-style-type: none"> ▪ Implement programs for removing disabled vehicles and their occupants from limited access highways and extending hours, especially at night, of existing “courtesy patrol” programs.
<i>Large Trucks</i>	
Engineering	<ul style="list-style-type: none"> ▪ Reduce driver fatigue-related crashes by providing center and shoulder rumble strips and truck parking areas. ▪ Increase use of heavy truck lane restrictions and consider implementation of “truck only” lanes in areas identified as having very high commercial vehicle volumes during concentrated, typically nighttime, periods. ▪ Create adequate storage for truck inspection stations in and around ports of entry.
Enforcement	<ul style="list-style-type: none"> ▪ Increase enforcement of commercial (i.e., truck) motor vehicle speed limits. ▪ Increase inspections of trucks for safety equipment and violations. Consider decreasing minimum jurisdiction size for conducting for Level 1 truck inspections.*
Education	<ul style="list-style-type: none"> ▪ Increase public knowledge about techniques for sharing the road with trucks and other vehicles. ▪ Conduct PI&E campaigns on heavy vehicle operational/performance limitations, rules, crash experience and restrictions. .
Public Policy and Other	<ul style="list-style-type: none"> ▪ Coordinate with Department of Homeland Security for funding inspection stations/personnel to staff.

* May require legislative action

User Behavior	
<i>Driving Under the Influence (Drugs and Alcohol)</i>	
Enforcement	<ul style="list-style-type: none"> ▪ Continue to use Selective Traffic Enforcement Programs (STEPS) to deter drunk driving. ▪ Limit the ability of drivers charged with DWI to plea bargain the charge down to a lesser offense. ▪ Increase training and the use of new technology to reduce DUI/DWI processing time of suspects. ▪ Increase enforcement of vehicle confiscation law. ▪ Increase enforcement of Zero Tolerance laws for underage drivers. ▪ Warrants should be used to obtain evidence when breath or blood tests are refused. ▪ Increase the use of interlock devices as a condition of bond for DWI, intoxicated assault, and intoxicated manslaughter. ▪ Develop and implement programs that provide rapid response for DWI reported by citizens. A dedicated phone number for reporting would be useful. ▪ Explore issues related to implementing sobriety check points.
Education	<ul style="list-style-type: none"> ▪ Continue PI&E campaigns to encourage people not to drive impaired. ▪ Develop bilingual, culturally appropriate, materials for anti-DWI campaigns. ▪ Educate judges and prosecutors concerning DWI laws. ▪ Educate legislators in regards to the financial burden and human impact of DWI. ▪ Develop, implement and maintain effective designated driver campaigns and programs.
EMS	<ul style="list-style-type: none"> ▪ Promote alcohol screening in trauma centers and emergency rooms.
Public Policy and Other	<ul style="list-style-type: none"> ▪ Consider tougher penalties for drivers convicted of having blood alcohol concentrations of 0.15 or greater, if research demonstrates that such penalties do not adversely effect sentencing.* ▪ Require all drivers involved in fatal crashes to be tested for alcohol use.* ▪ Establish minimum sentencing for DWI offenses.* ▪ Re-evaluate, strengthen and create uniform enforcement of administrative license revocation (ALR) law.* ▪ Encourage expansion of DWI courts as a viable track for offenders. ▪ Improve BAC reporting through breath and/or blood testing. ▪ Explore ways to make DWI offenders less anonymous (zebra plates, public service appearances, etc).
<i>Speed Related (Over Limit, Unsafe Speed or Failure to Control Speed)</i>	
Engineering	<ul style="list-style-type: none"> ▪ Encourage the use of traffic calming (roundabouts, bumps, striping, etc.) in urban and rural areas. ▪ Reduce speed limits on roads with poor geometrics. ▪ Encourage the use of speed activated feedback or warning signs to increase compliance with speed limits. ▪ Increase the use of commercial motor vehicle truck lane restrictions and truck only lanes.

* May require legislative action

User Behavior	
Enforcement	<ul style="list-style-type: none"> ▪ Continue to use STEPs to deter speeding. ▪ Use minimally marked enforcement vehicles to enforce speed laws. ▪ Continue speed enforcement in school and work zones.
Education	<ul style="list-style-type: none"> ▪ Develop and implement PI&E campaigns targeting speed and speed-related behaviors (adjusting speed according to conditions, use the left lane for passing only, etc.). ▪ Encourage the addition of learning modules to driver education curriculums to address safe speed selection according to conditions.
Public Policy and Other	<ul style="list-style-type: none"> ▪ Require tougher penalties for excessive speeding e.g., 20% or more above the limit) and in special corridors. Earmark a portion of the fines collected for state and local safety incentives.* ▪ Dedicate a portion of citation revenue back to enforcement efforts (like STEP programs) and other state and local traffic safety initiatives.* ▪ Encourage insurance companies to provide incentives to discourage speeding among their clients.
<p><i>Occupant Protection</i> <i>Lack of Seat Belt Usage in Serious Crashes</i></p>	
Enforcement	<ul style="list-style-type: none"> ▪ Continue to use STEPs to increase occupant restraint use.
Education	<ul style="list-style-type: none"> ▪ Continue PI&E campaigns to encourage occupant restraint use giving special attention to low use population subgroups. ▪ Develop PI&E materials with better instructions for child and booster seat installation. ▪ Increase the quantity of bilingual educational materials for safety belt and child seat campaigns. ▪ Promote community child seat checkup events and establish permanent checkpoints in local areas. ▪ Encourage and/or increase educational efforts focused on pre-drivers (school programs, roll-over convincers, etc.). Develop PI&E materials which provide better instructions for child and booster seat installation.
EMS	<ul style="list-style-type: none"> ▪ Encourage hospitals to ensure children are properly restrained before they are discharged.
Public Policy and Other	<ul style="list-style-type: none"> ▪ Develop strategies to address nighttime belt use. ▪ Increase penalties for occupant protection violations.* ▪ Make non-use of safety belts and child seats a moving violation in Texas to encourage perennial non-users to buckle-up.*

* May require legislative action

User Behavior	
<i>Aggressive Drivers</i>	
Enforcement	<ul style="list-style-type: none"> ▪ Train law enforcement to recognize aggressive driving behaviors. ▪ Increase high visibility enforcement. ▪ Increase coordinated enforcement of aggressive driving.
Education	<ul style="list-style-type: none"> ▪ Conduct PI&E campaigns about aggressive driving and basic tips for dealing with an aggressive driver. ▪ Educate pre-drivers and those participating in defensive driving and driver education programs about aggressive driving and how to deal with such behavior. ▪ Educate aggressive drivers to remediate behavior.
Public Policy and Other	<ul style="list-style-type: none"> ▪ Define aggressive driving for purposes of classifying crashes. ▪ Ensure data systems can accurately capture aggressive driving as a specific safety issue. ▪ Develop or access technology that can use vehicle data recording devices to capture aggressive driving activities of individual drivers. ▪ Enhance penalties for aggressive driving.*
<i>Cell Phone Usage</i>	
Enforcement	<ul style="list-style-type: none"> ▪ Train police officers to investigate and record cell phone usage as a contributing factor in crashes. ▪ Develop and disseminate educational materials to raise the awareness of the risks of cell phone use and driving.
Public Policy and Other	<ul style="list-style-type: none"> ▪ Develop a baseline for crashes related to cell phone use (voice or text messaging). ▪ Institute penalties for drivers using cell phones while their vehicle is moving.*

* May require legislative action

System Administration	
<i>Traffic/Crash Records</i>	
EMS	<ul style="list-style-type: none"> ▪ Supplement crash records with public health records (e.g., hospital discharge records) to obtain a clearer picture of the true societal costs of traffic crashes. The Texas Crash Outcome Data Evaluation System (CODES) project might serve as a model for such a records system.
<i>E911 Reporting Systems</i>	
EMS	<ul style="list-style-type: none"> ▪ The emergency medical services community should take the lead in pressing for the expenditure of already available funds to increase deployment of E911 systems in Texas.
<i>Public Awareness</i>	
Engineering	<ul style="list-style-type: none"> ▪ Involve Chambers of Commerce in identifying and addressing crash-prone traffic corridors.
Education	<ul style="list-style-type: none"> ▪ Announce forecasts of traffic casualties before holiday weekends. ▪ Work on the development of a “safety culture,” as has been done in Europe and Australia (with resultant dramatic reductions in traffic crashes)
<i>Policy Maker Awareness</i>	
Education	<ul style="list-style-type: none"> ▪ Develop approaches/methods and support for disseminating information to policy makers, e.g. central dedicated web sites.