

DEPT. OF TRANSPORTATION  
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## **NHTSA Vehicle Safety Rulemaking and Research Priority Plan 2009-2011**

### **I. INTRODUCTION**

The National Highway Traffic Safety Administration's mission is to "save lives, prevent injuries, and reduce economic costs due to road traffic crashes." One of the most important ways in which the agency carries out its safety mandate is to issue Federal Motor Vehicle Safety Standards (FMVSS). Through these rules, NHTSA strives to reduce the number of crashes and to minimize the consequences of those crashes that do occur. This NHTSA Vehicle Safety Priority Plan describes the projects the agency plans to work on in the rulemaking and research areas for calendar years 2009 to 2011. This is not an exhaustive list. Only programs and projects that are priorities or will take significant agency resources are listed. Furthermore, NHTSA's enforcement, data collection, and analysis programs -- vital elements in achieving NHTSA's goals -- have their own set of priorities that are not listed here. Each of these programs supports NHTSA's rulemaking and research priorities by providing necessary safety data, economic analysis, expertise on test procedures, and technical issues gleaned from enforcement experience.

This plan is an internal management tool as well as a means to communicate to the public NHTSA's highest priorities to meet the Nation's motor vehicle safety challenges. Among them are programs and projects involving rollover crashes, children (both inside as well as just near vehicles), motorcoaches and fuel economy that must meet Congressional mandates or Secretarial commitments. Since these are expected to consume a significant portion of the agency's rulemaking resources, they affect the schedules of the agency's other priorities listed in this plan. The concept of this plan, in terms of timing, is a little different than the 5-year priority plans that the agency has issued in the past. This plan lists the programs and projects the agency anticipates working on even though there may not be a rulemaking planned to be issued by 2011, and in several cases, the agency doesn't anticipate that the research will be done by the end of 2011. Thus, in some cases the next step would be an agency decision in 2012 or 2013. NHTSA is also currently in the process of developing a longer-term motor vehicle safety strategic plan that would encompass the period 2012 to 2020.

### **II. BACKGROUND**

Motor vehicle crashes killed more than 41,000 people and injured nearly 2.5 million others in more than 6 million police-reported crashes in 2007. In addition to the terrible personal toll, these crashes make a huge economic impact on our society with an

estimated annual cost of \$230 billion,<sup>1</sup> an average of \$750 for every person in the United States.

Motor vehicle crashes can be viewed through several different perspectives:

- Vehicle type;
- Crashworthiness;
- Crash avoidance;
- Crash partners; and
- Body region injured; and
- Societal costs.

Figure 1 and Table 1 look at fatalities by vehicle type. Passenger vehicles still account for the majority of fatalities (70% or 28,933 fatalities), but also account for 92 percent of the vehicle miles traveled (VMT).

Figure 1: Fatalities by Vehicle Type

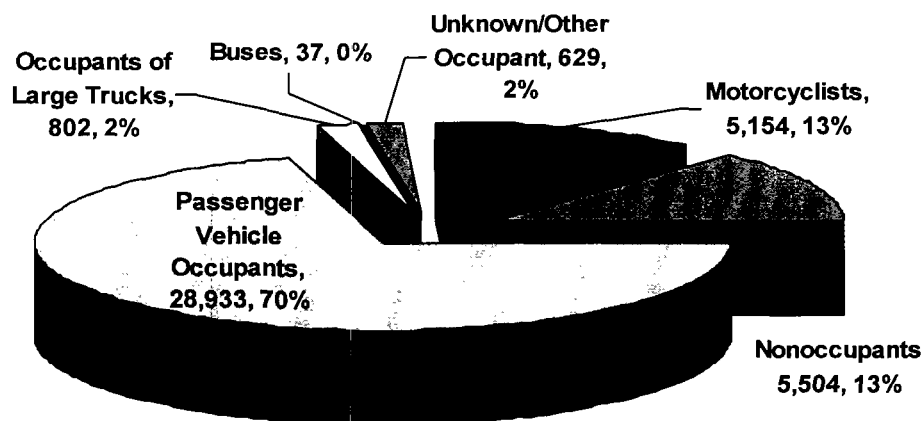


Table 1: 2007 U.S. Fatalities by Person Type

	Fatalities
<b>Total Fatalities</b>	<b>41,059</b>
Passenger Vehicle Occupants	28,933
Motorcycle	5,154
Large Truck, Bus, Other Vehicle Occupants	1,468
Nonoccupants	5,504
<i>Pedestrian</i>	<i>4,654</i>
<i>Pedalcyclists</i>	<i>698</i>

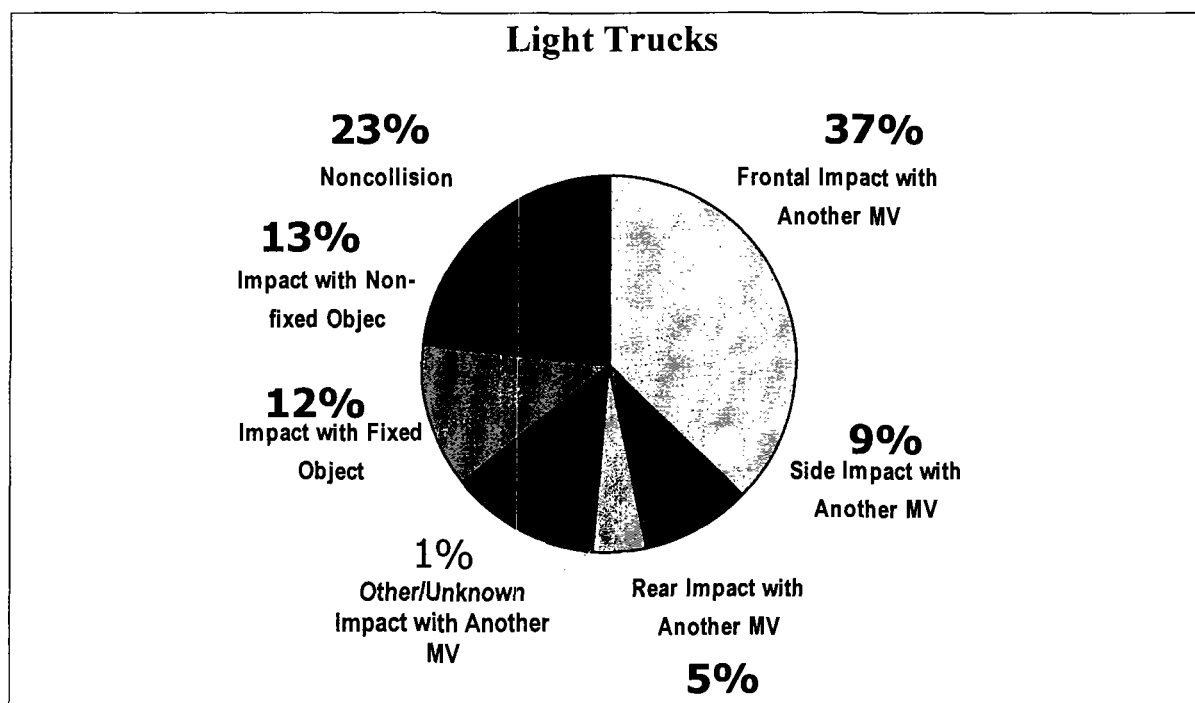
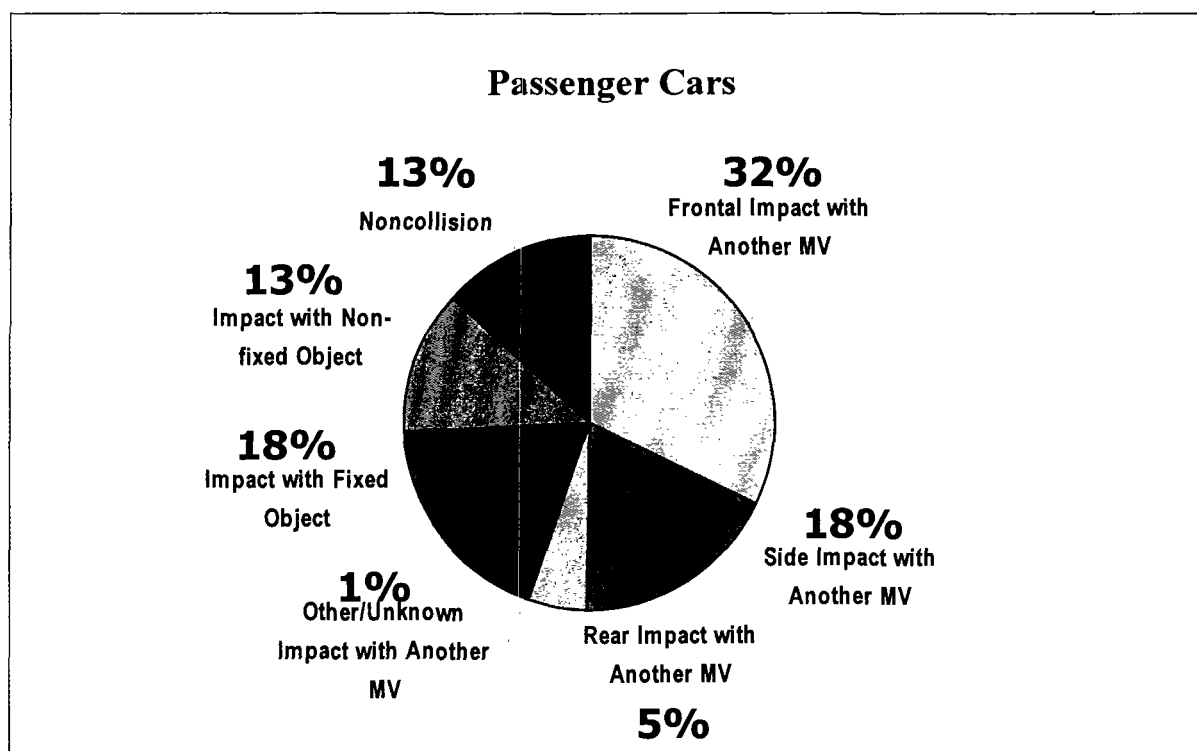
<sup>1</sup> These estimates are in year 2000 dollars.

From the crashworthiness perspective, NHTSA looks at occupant fatalities or crash types by what part of the vehicle was struck first. Typically for passenger vehicles the initial impact point in fatal crashes would be frontal in 55 percent of fatalities, side impacts in 28 percent, non-collision (rollovers) in 8 percent, rear impacts in 5 percent, and others in 4 percent. However, rollovers can be examined as the initial impact, or as any event in the crash. If rollovers are examined as any event in the crash, almost 10,200 fatalities occur per year in rollovers, or about one-third of the passenger vehicle total.

From the crash avoidance perspective, NHTSA looks at types of crashes that might be mitigated by new technologies. Based on the General Estimates System (GES) and the Fatality Analysis Reporting System (FARS), four types of crashes total 85 percent of all crashes. These include Run-Off-Road (23%), Rear-End (28%), Lane Change (9%), and Crossing Path (25%). Those same four types of crashes also equal 75 percent of all road fatalities. These include Run-Off-Road (41%), Rear-End (5%), Lane Change (4%), and Crossing Path (14%).

The fourth perspective of looking at motor vehicle crashes is crash type with respect to what the vehicle impacted, if anything (see Figure 2). For both passenger cars and light trucks, frontal crashes with other motor vehicles account for the highest percentage of crash fatalities, 32 percent and 37 percent respectively. For passenger cars, side impacts with other motor vehicles and impact with fixed objects both account for 18 percent of fatalities. In fatal crashes involving light trucks, non-collisions (rollovers) remain an issue, accounting for 23 percent of crash fatalities.

**Figure 2: Fatalities by Crash Type**



A fifth and a sixth perspective are those of body region injured and societal costs. Brain injuries and ankle and knee injuries that have long-term disability associated with them have very high societal costs.

NHTSA looks at crashes from all these different perspectives in determining the priorities for the agency. Countermeasures affect different types of crashes in different ways and have to be examined individually and compared to the applicable target population.

### **Priority Programs and Projects**

Programs and projects that warrant priority consideration fall into the following four categories: (1) large safety benefits; (2) vulnerable populations; (3) high-occupancy vehicles; and, (4) other considerations

Programs and projects that are in Category 1, large benefits, have the potential for large safety benefits based upon factors such as:

- The size of the target population;
- The effectiveness of countermeasures and their potential to save lives and prevent injuries;
- The availability and practicability of these countermeasures; and
- The potential that countermeasures could be developed in the future that could be reasonably effective against a large target population.

It should be noted that some projects require additional research before specific countermeasures and their benefits can be identified and therefore the priority designation is based on the agency's judgment of potential safety impacts.

Programs and projects in Category 2, vulnerable populations, affect children, older people, the vision-impaired, or other populations that are considered vulnerable.

Category 3, high-occupancy vehicles, involves buses or motorcoaches and other high-occupancy vehicles.

Category 4, other considerations, includes priority projects that may not be captured in the other categories, but either reduce the impact of motor vehicles on energy security or address other specific items.

**Other Significant Programs and Projects**

This plan also includes a comprehensive list of other significant programs and projects that the agency believes it will work on in the 2009-2011 timeframe. This area is fluid, because the agency receives petitions that require action, Congress may request that the agency address other areas, the Administration may set additional and/or different priorities, or some event may influence NHTSA's priority agenda.

Some programs and projects described in the plan require additional research before any rulemaking action can be taken. These programs may not be priorities now because NHTSA is not confident that an effective countermeasure can be found. However, with research going on, there is the possibility that countermeasures may be discovered that have significant death and injury reduction benefits.

**Dates Provided**

Programs and projects that are in the research stage are noted with milestones indicated when NHTSA plans to decide whether and how to proceed. In general, this is an agency decision whether the program or project is ready to move from the research stage and into the rulemaking stage, or whether the program or project needs more research. (Dates are given in calendar years, not fiscal years.)

For projects that NHTSA believes will be in the rulemaking stage, the agency has indicated dates when it anticipates issuing a Notice of Proposed Rulemaking (NPRM) or a Final Rule. Those dates are subject to change for a variety of reasons, such as complications encountered in the research phase, or new priority activities interrupt a project's progress, etc.

**Program Areas**

The projects have been divided into the following program areas: light-vehicle crash avoidance and mitigation advanced technologies, motorcycles, rollovers, front-impact occupant protection, side-impact occupant protection, rear-seat occupant protection, children, older people, global technical regulations (international harmonization), heavy vehicles, CAFE, and others (a catchall category for projects that don't fit in the listed program areas).

Crash avoidance projects and programs are listed first because their focus is on the first opportunity to save lives and reduce injuries by preventing crashes in the first place. In addition they serve to reduce property damage and traffic congestion that are the inevitable result of most crashes.

## **PRIORITY PROJECTS BY PROGRAM AREA**

### **LIGHT-VEHICLE CRASH AVOIDANCE AND MITIGATION - ADVANCED TECHNOLOGIES**

#### **Forward Collision Avoidance and Mitigation**

Description: Develop performance criteria and objective tests to support the identification of effective advanced safety technologies that provide a warning of an impending forward collision and/or automatically brake/slow the vehicle. NHTSA has developed a performance test for New Car Assessment Program (NCAP) purposes that will appear in NCAP data on a warning system in model year 2011 vehicles. The agency will decide whether to require automatic crash-imminent braking.

Priority Category: Large Benefit

Next Milestone: Next agency decision in 2011

#### **Lane Departure Prevention**

Description: Develop performance criteria and objective tests to support identification of effective advanced safety technologies that provide a warning of an imminent lane departure and/or of vehicles that keep drivers in their lanes. NHTSA has developed a performance test for NCAP purposes that will appear in NCAP data on a warning system in vehicle model year 2011. The agency will decide whether to require automatic lane-keeping.

Priority Category: Large Benefit

Next Milestone: Next agency decision in 2011

#### **Vehicle Communications**

Description: Advanced technologies that utilize vehicle-based sensors have been demonstrated to be effective at helping drivers avoid crashes. Vehicle-to-vehicle (V2V) and vehicle-to-infrastructure (V2I) communications can improve the effectiveness and availability of these safety systems. Communications can also enable numerous other safety applications such as speed management, intersection collision avoidance, and congestion.

Priority Category: Large Benefit

Next Milestone: Next agency decision in 2013

#### **Alcohol Initiative**

Description: NHTSA entered into a 5-year cooperative agreement with the Automotive Coalition for Traffic Safety (ACTS) in early 2008 aimed at developing alcohol detection technologies to reduce drunk driving that could have widespread deployment and are

non-invasive, reliable, accurate, and precise. These technologies would be less intrusive than ignition interlocks. To achieve this goal the project aims to: (1) assess the current state of alcohol detection devices, and (2) support the development and testing of prototypes and subsequent hardware that may be installed in vehicles. The prototypes would then undergo extensive laboratory and field testing.

Priority Category: Large Benefit

Next Milestone: Next agency decision in 2012 on availability of technology for in-vehicle testing.

## **MOTORCYCLES**

### **Motorcycle Braking**

Description: Require anti-lock braking systems for motorcycles. Preliminary data indicate potentially large benefits for braking improvements, but the agency needs more data to determine whether the improvement is statistically significant.

Priority Category: Large Benefit

Next Milestone:

NPRM: 2010

## **ROLLOVERS**

### **Ejection Mitigation**

Description: This proposed standard would reduce the partial and total ejection of vehicle occupants through side windows in crashes, particularly rollover crashes.

Congressional Requirements: The Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) Act requires a final rule establishing performance standards to reduce complete and partial ejections of vehicle occupants from outboard seating positions by October 1, 2009.

Priority Category: Large Benefit

Next Milestone:

NPRM: 2009

Final Rule: 2009

## **CHILDREN**

### **Child Restraints in Side Impacts**

Description: Propose test procedures in FMVSS 213 to assess child restraint performance in near-side impacts. Amend Part 572 to add the Q3 dummy. Included in this program is an evaluation of the injury-causing potential of vehicle side interior surfaces.



Priority Category: Vulnerable Population – Secretary’s directive for a top-to-bottom review of child restraints

Next Milestone:

NPRM: 2010

### **New Car Assessment Program Vehicle-Child Restraint System (CRS) Fit Program**

Description: A consumer service program that provides vehicle-CRS “fit” recommendations on [www.safercar.gov](http://www.safercar.gov) by encouraging vehicle manufacturers to voluntarily recommend child restraint models that “fit” in each vehicle.

Priority Category: Vulnerable Population– Secretary’s directive for a top-to-bottom review of child restraints

Next Milestone:

NPRM or decision notice: 2009

Final Rule or decision notice: 2010

Effective for NCAP program for MY 2011

### **Rear Visibility of Vehicles**

Description: A backover crash involving a light vehicle at low speed is a tragic affair, with a small child often being the victim. The agency has conducted research on a variety of rear-visibility technologies to mitigate these types of crashes. NHTSA published an Advanced Notice of Proposed Rulemaking (ANPRM) on rear visibility on March 4, 2009.

Congressional Requirements: The Cameron Gulbransen Kids Transportation Safety Act of 2007

Priority Category: Vulnerable Population

Next Milestone:

ANPRM: 2009

NPRM: 2009

Final Rule: 2011 (per statute 2/28/2011)

### **Power Windows**

Description: A rulemaking to consider requiring power windows on motor vehicles to automatically reverse direction when closing when such power windows detect an obstruction to prevent children and others from being trapped, injured, or killed.

Congressional Requirements: The Cameron Gulbransen Kids Transportation Safety Act of 2007

Priority Category: Vulnerable Population

Next Milestone:

NPRM: 2009

Final Rule: 2010 (per statute 8/28/2010)

### **Brake Transmission Shift Interlock**

Description: This interlock will require that the service brake pedal be depressed before the transmission can be shifted out of “park,” and will function in any starting system key position. The NPRM will seek public input on how best to implement the Congressional mandate.

Congressional Requirements: The Cameron Gulbransen Kids Transportation Safety Act of 2007

Priority Category: Vulnerable Population

Next Milestone:

NPRM: 2009

Final Rule: 2010

## **HEAVY VEHICLES<sup>2</sup>**

### **Truck Tractor Stability Control**

Description: Develop test procedures for a standard on stability control for truck tractors. Two countermeasures are being tested and examined, roll stability control and electronic stability control. These stability systems are aimed at addressing rollover and loss of control crashes.

Priority Category: Large Benefit

Next Milestone:

NPRM: 2010

### **Heavy-Vehicle Forward Collision Avoidance and Mitigation**

Description: Develop performance criteria and objective tests to support the identification of effective advanced safety technologies that provide warning of an impending forward collision and/or automatically brake/slow the vehicle.

Priority Category: Large Benefit

Next Milestone: Next agency decision in 2011

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<sup>2</sup> “Heavy vehicles” include most vehicles over 10,000 pounds GVWR, including truck tractors, single-unit trucks, buses, motorcoaches, etc.

**Motorcoach Lap/Shoulder Belts**

Description: Consider requiring lap/shoulder belts for motorcoaches.

Priority Category: High-Occupancy Vehicle and Secretary's directive to develop a Motorcoach Safety Action Plan

Next Milestone:

NPRM: 2009

Final Rule: 2010

**Motorcoach Fire Safety**

Description: Consider upgrading the fire standards that apply to motorcoaches.

Priority Category: High-Occupancy Vehicle and Secretary's directive to develop a Motorcoach Safety Action Plan

Next Milestone: Next agency decision in 2011

**Motorcoach Emergency Evacuation**

Description: Consider upgrading the motorcoach evacuation standards.

Priority Category: High-Occupancy Vehicle and Secretary's directive to develop a Motorcoach Safety Action Plan

Next Milestone: Next agency decision in 2010

**Motorcoach Roof Strength**

Description: Propose new motorcoach roof strength requirements. The agency has tested two new test procedures with motorcoaches.

Priority Category: High-Occupancy Vehicle and Secretary's directive to develop a Motorcoach Safety Action Plan

Next Milestone: Next agency decision in 2009

**FUEL ECONOMY****Passenger Car and Light-Truck Fuel Economy Standards (Corporate Average Fuel Economy, or CAFE standards)**

Description: The Environmental Protection Agency and the Department of Transportation issued a notice of intent to issue a joint rulemaking for MY 2012-2016 passenger cars and light trucks to address global climate change and to reduce fuel consumption. The proposal would consider MY 2016 greenhouse gas (GHG) standards

of 250 grams/mile CO<sub>2</sub>, which would equate to achieving an average fleetwide level of 35.5 mpg.

Congressional Requirements: Energy Independence and Security Act (EISA)

Priority Category: Energy Security Benefits

Next Milestone:

NPRM: 2009

Final Rule: 2010

### **Medium/Heavy Work Truck Rules**

Description: Fund the National Academy of Science to perform a Congressionally mandated study for fuel economy regulation of medium and heavy work trucks.

Congressional Requirements: Energy Independence and Security Act

Priority Category: Energy Security Benefits

Next Milestone: Next agency decision in 2011

### **CAFE/Greenhouse Gas Labeling Rule**

Description: EISA mandates NHTSA to develop a labeling rule that rates CAFE vehicle fuel economy and greenhouse gas (GHG) emissions.

Congressional Requirements: Energy Independence and Security Act

Priority Category: Energy Security Benefits

Next Milestone:

NPRM: 2010

Final Rule: 2011

### **Fuel Economy Education Campaign**

Description: EISA mandates NHTSA to develop a fuel economy education program.

Congressional Requirements: Energy Independence and Security Act

Priority Category: Energy Security Benefits

Next Milestone:

NPRM: 2010

Final Rule: 2011

**Fuel Tank Labeling Program**

Description: EISA mandates NHTSA to develop a fuel tank labeling program for alternative-fuel vehicles.

Congressional Requirements: Energy Independence and Security Act

Priority Category: Energy Security Benefits

Next Milestone:

NPRM: 2010

Final Rule: 2011

**Consumer Tire-Rating Program**

Description: EISA mandates NHTSA to develop a joint fuel economy and safety rating program for replacement tires, and an education program relating to various tire information.

Congressional Requirements: Energy Independence and Security Act

Priority Category: Energy Security Benefits

Next Milestone:

NPRM: 2009

Final Rule: 2009

**OTHER****Alternative Fuel Systems****Hydrogen**

Description: NHTSA's approach is to develop foundational research that will be necessary to determine future requirements, such as research on performance of high-pressure cylinders in fires, localized flame impingement on cylinders, electrical integrity of high-voltage fuel cell propulsion systems, and developing criteria for post-crash hydrogen leakage.

Priority Category: Environmental Benefits

Next Milestone: To be determined

**Batteries**

NHTSA will investigate the potential safety risks posed by lithium ion battery storage devices.

Priority Category: Environmental Benefits

Next Milestone: Agency report in 2011

### **III. OTHER SIGNIFICANT PROJECTS BY PROGRAM AREA**

#### **LIGHT-VEHICLE CRASH AVOIDANCE AND MITIGATION - ADVANCED TECHNOLOGIES**

##### **Blind Spot Detection**

Description: Examine the potential of sensors and mirrors to detect vehicles in blind spots to assist in lane changing.

Next Milestone: Next agency decision in 2013

#### **MOTORCYCLES**

##### **Motorcycle Helmet Labeling**

Description: Amend labeling of motorcycle helmets to reduce sales and use of novelty helmets. The agency issued an NPRM in October 2008.

Next Milestone:

SNPRM: 2009

Final Rule: 2010

#### **ROLLOVERS**

##### **Restraint Effectiveness in Rollovers**

Description: Develop test procedures to evaluate occupant restraint performance in rollover crashes. This program will develop test procedures, evaluate countermeasures such as pretensioners, integrated seat belts, 4-point belts, and air belts, and estimate potential safety benefits.

Next Milestone: Next agency decision in 2010

#### **FRONT IMPACT OCCUPANT PROTECTION**

##### **Seat Belt Reminder Systems**

Description: Seat Belt Reminder Systems tell drivers and front-right passengers they have not buckled up. Many different systems are currently being provided in new cars, but NHTSA does not have a standard requiring them. This project is designed to develop performance requirements for seat belt reminder systems to improve seat belt usage.

Next Milestone: Next agency decision in 2011

##### **Oblique/Low-Offset Frontal Crashes**

Description: Analysis of frontal-crash fatalities for those belted with air bags shows offset and oblique crashes as causing the largest group of fatalities. NHTSA will examine the potential for reducing fatalities and injuries in these crashes.

Next Milestone: Next agency decision in 2011

**Compatibility**

Description: Examine improved load cells, examine progressively deformable barriers, examine benefits from voluntarily installed lower frontal structures designed to reduce aggressiveness, continue working on biomechanics of the knee-thigh-hip area, and enhance vehicle compatibility in crashes.

Next Milestone: Next agency decision in 2009

**Pre-Collision Air Bag/Safety System Activation**

Description: Develop test procedures to evaluate restraint systems and estimate benefits for prototype systems that use pre-crash information to pre-arm air bags or other safety systems.

Next Milestone: Next agency decision in 2010

**Next Generation NCAP**

Description: Conduct real-world analysis of frontal, side, and rollover crashes, crash frequency, injury severity, and demographics (age, gender, size) to develop a more representative crash scenario to address Abbreviated Injury Scale (AIS) 3+ injuries. Develop crash test procedures and a more sensitive and biofidelic crash test dummy at low speeds. Develop an updated rollover risk model using crash data from recent MY vehicles equipped with electronic stability control. Conduct real-world crash data analyses to identify additional beneficial advanced technologies for the NCAP program beyond ESC, LDW, and FCW systems. Subsequently develop relevant advanced technology test procedures.

Next Milestone: Multiple decisions from 2010 through 2012

**Monroney Label NCAP**

Description: Section 10307 of the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) requires new passenger vehicles to be labeled with safety rating information published by NHTSA's New Car Assessment Program. As a result of the July 2008 final decision notice enhancing the program, the agency must update the safety rating portion of the Monroney label.

Next Milestone:

NPRM: 2009

Final Rule: 2010

**SIDE-IMPACT OCCUPANT PROTECTION****Side Impact Dummies - Adults**

Description: Research the 5<sup>th</sup> percentile female and 50<sup>th</sup> percentile male world side-impact dummies (WorldSID) and prepare for Federalization.

Next Milestone: Next agency decisions in 2011

## **REAR-SEAT OCCUPANT PROTECTION**

### **Low Delta V Restraint Protection**

Description: Evaluation of air belt or other technologies suitable for improving thoracic protection to older persons in low-speed crashes.

Next Milestone: Next agency decision in 2012

## **CHILDREN**

### **Improve Frontal Protection for Children - Booster Seats**

Description: Add into FMVSS 213 "Child Restraint Systems" requirements for booster seats for older children, and add a 10-year-old crash test dummy to Part 572.

Next Milestone:

SNPRM: 2009

Final Rule: 2011

### **Improve Frontal Protection for Children -- Lower Anchors and Tethers for Children (LATCH)**

Description: Address issues raised at LATCH public meeting, that include using LATCH in the center rear seat, tether anchorage locations, weight limit differences between child safety seats and tether anchorages, and labeling of anchorage locations.

Next Milestone: Next agency decision in 2011

### **Improve Frontal Protection for Children – Test Requirements**

Description: Examine how well the test parameters of the FMVSS 213 sled test replicate the real world, including crash pulse, test velocity, excursion limits, the test seat, adding a lap/shoulder belt, etc.

Next Milestone: Next agency decision in 2010

## **OLDER PERSONS**

### **Older Occupant Protection**

Data collection/analysis of crashes with older occupants to direct regulatory programs in frontal and side impacts

Next Milestone: Next agency decision in 2010

## **GLOBAL TECHNICAL REGULATIONS**

### **Pedestrian**

Description: Based on global technical regulations (GTR), NHTSA would propose regulations affecting the hood and bumper areas of light vehicles to reduce injuries to struck pedestrians. The pedestrian dummy leg would be added to Part 572.

Next Milestone:



ANPRM: 2009  
 NPRM: 2011

### **Motorcycle Brakes**

Description: Based on the GTR, NHTSA would include new testing requirements for motorcycle antilock brake system testing and would amend the wet stopping distance test. An NPRM was issued in 2008.

Next Milestone:  
 Final Rule: 2010

### **Glazing**

Description: Amend FMVSS 205 "Glazing Materials" to align with GTR.

Next Milestone:  
 NPRM: 2009  
 Final Rule: 2011

### **Head Restraints**

Description: Based on the GTR discussion, amend head restraint requirements.

Next Milestone:  
 NPRM: 2010  
 Final Rule: 2011

### **Head Restraints – Phase 2**

Description: Examine seat back performance, height requirement, and biofidelic rear-impact dummy (BIORID).

Next Milestone: Next agency decision in 2013

## **HEAVY VEHICLES**

### **Heavy-Truck Stopping Distance**

Description: NHTSA issued an NPRM in December 2005 to reduce truck tractor stopping distance by 20 to 30 percent.

Next Milestone:  
 Final Rule: 2009

### **Heavy-Vehicle Electronic Data Recorders**

Description: Develop performance requirements for heavy-vehicle electronic data recorders (EDRs).

Next Milestone: Next agency decision in 2010

**Heavy-Vehicle Truck Tires**

Description: Upgrade the endurance test in FMVSS 119 “New Pneumatic Tires for Vehicles Other Than Passenger Cars” and add a new high-speed test for heavy-vehicle tires.

Next Milestone:

NPRM: 2009

Final Rule: 2011

**OTHER****Driver Distraction**

Description: NHTSA’s human factors research is integrated with intelligent technologies research to examine the interaction of driver, vehicle, and environment in order to improve driver-vehicle performance.

Next Milestone: Ongoing

**Biomechanics Program**

Description: The biomechanics program develops injury assessment methods including advanced anthropometric test device (ATD) research and associated injury criteria. Priority programs and timelines are:

Next milestone:	On whether to incorporate into regulations
Rotational brain criteria	Next agency decision 2011
Multi-point chest criteria	Next agency decision 2011
Advanced 3-, 6-, 10-year-old child dummies	Next agency decision 2014/2015
THOR 5th and 50th percentile dummies	Next agency decision 2011 for 50 <sup>th</sup> percentile, 2013 for 5 <sup>th</sup> percentile

**Quieter Cars**

Description: Examine the issue of blind pedestrians and others not being able to hear electric vehicles or other quiet vehicles. The agency issued a research plan on this project, “Quieter Cars and the Safety of Blind Pedestrians, A Research Plan,” in April 2009.

Next Milestone: Next agency decision in 2010

**Advanced Automatic Collision Notification (AACN)**

Description: AACN provides early contact with emergency personnel and GPS position when a severe crash occurs. Examine potential benefits and triage capabilities of AACN and EMS connection to get serious injuries to a Level 1 trauma hospital. Determine whether a rulemaking is warranted.

Next Milestone: Next agency decision in 2010

**Lighting Standard**

Description: Develop a performance-based standard for FMVSS No. 108 “Lamps, Reflective Devices, and Associated Equipment.”

Next Milestone: Next agency decision in 2012

**Rear Turn Signals**

Description: An evaluation shows that amber rear turn signals reduce more crashes (vehicles struck in the rear while turning) than red rear turn signals. Consider whether to amend FMVSS No. 108.

Next Milestone: Next agency decision in 2009

**Tire Aging**

Description: Require an oven-aging test for tires prior to running them through an endurance test. This could help reduce tread separations that occur in hot weather States.

Next Milestone: Next agency decision in 2010

**Light Vehicle EDR Update**

Description: Development of new performance requirements for side and rollover data collection.

Next Milestone: Next agency decision in 2012