Overview of NHTSA Priority Plan for Vehicle Safety and Fuel Economy, 2015 to 2017

The primary mission of the National Highway Traffic Safety Administration (NHTSA) is to "save lives, prevent injuries, and reduce economic costs due to road traffic crashes." NHTSA strives to meet its mission through a wide range of behavioral and vehicle safety programs. NHTSA's mission also includes a commitment to environmental sustainability through setting and enforcing fuel economy and efficiency standards.

NHTSA's vehicle safety program seeks to meet these objectives through:

- development, issuance and enforcement of Federal motor vehicle safety standards (FMVSS), regulations and fuel economy/efficiency standards,
- development and dissemination of vehicle and equipment performance information to consumers, including through its New Car Assessment Program (NCAP),
- investigation of possible safety defects and noncompliance, and when appropriate, seeking recalls of vehicles and equipment that pose an unreasonable safety risk or do not comply with the FMVSS,
- research to define safety problems and to support the development of standards to address these problems,
- research to aid the development and deployment of advanced technologies that improve safety and fuel efficiency, and
- collection and analysis of crash data to identify potential safety problems and to assess the effectiveness of proposed solutions.

This plan serves as an internal management tool as well as a means to communicate to the public and regulators in other countries NHTSA's highest priorities. Our hope is that this plan will advance motor vehicle safety by providing information that our stakeholders and others can use for their own planning as well as encouraging regulatory cooperation as we work to improve safety for the American public.

The plan describes only programs and projects that are priorities and does not include the many other important projects as well as routine activities for which the Office of Vehicle Safety or other NHTSA offices are responsible. Of course, as with any plan, as circumstances change the agency may need to adjust these priorities.

The selection of projects as priorities is informed by a wide variety of external and internal factors. The primary driving forces are **crash data** indicating the areas in greatest need of improvement and knowledge of the technologies that are or can be expected to become available to address those areas. The data tell us which crash scenarios account for the largest number of crashes as well as the largest number of moderate, serious and fatal injuries.

Motor vehicle crashes killed 32,719 people and injured over 2.3 million others in 2013. In addition to the terrible personal toll, these crashes have a huge economic impact on our society with an estimated annual cost of $242 billion, which is an average of $784 for every person in the United States. These crashes also result in $594 billion in societal harm from loss of life and the pain and decreased quality of life due to injuries.

The detailed data also indicate that significant current behavioral issues such as the failure to use seat belts, drunk driving and driver error need to be addressed in order to achieve progress in reducing injuries and fatalities. In 2013, 10,458 fatally injured occupants of passenger vehicles were not restrained, accounting for about 49 percent of all fatally injured passenger vehicle occupants. While seat belts saved 12,584 lives in 2013, it is estimated that 2,800 additional lives would have been saved if all unrestrained passenger vehicle occupants had worn their belts. Also, in 2013, 10,076 people were killed in drunk driving crashes. The majority of those people died in crashes involving drivers with a blood alcohol concentration (BAC) of .15 or higher – nearly double the legal limit. We also know that driver error is a significant contributor to crashes. NHTSA has found that driver error was the critical reason in 94 percent of crashes.

The crash data, combined with **testing, computer modeling and simulation with regard to new technologies,** also aid us in determining which current and future technological countermeasures offer the greatest promise in reducing injuries and preventing crashes. New safety technologies related to improved crashworthiness and crash avoidance have prevented a significant number of deaths over the years. Vehicle safety technologies saved an estimated 613,501 lives from 1960 through 2012. The annual number of lives saved grew quite steadily from 115 in 1960, when a small number of people used lap belts, to 27,621 in 2012, when most cars and light trucks were equipped with numerous modern safety technologies and belt use on the road reached 86 percent.

Of course, many other factors shape NHTSA's priorities. For example, the plan includes programs and projects that satisfy **Congressional mandates**. NHTSA also considers **recommendations offered by the National Transportation Safety Board (NTSB)**.

In addition to addressing current issues, our priorities also look toward the future. Motor vehicles and drivers' relationships with them are likely to change significantly in the next ten to

twenty years, perhaps more than they have changed in the last 100 years. Recent and **continuing advances in automotive technology and current research on and testing of exciting vehicle innovations** have created completely new possibilities for improving vehicle safety, increasing environmental benefits, expanding mobility, and creating new economic opportunities for jobs and investment. They also present new challenges.

In 2012, the National Research Council (NRC) of the National Academies published "The Safety and Challenge of Automotive Electronics: Insights from Unintended Acceleration." In view of the fact that today's vehicles are heavily reliant on complex electronic control systems and reflect the broader industry shift toward electronics and software, the NRC made recommendations that led the agency to develop research roadmaps that guide its research into the reliability and security of safety-critical electronic control systems. The report's recommendations, as well as the contents of the research roadmaps, have informed the projects contained in this priority plan.

The agency also is sensitive to the fact that the issue of privacy is an important factor in considering future technologies. The agency has the ability to address privacy concerns in order to promote the public acceptance and use of those technologies.

In 2013, NHTSA released its "Preliminary Statement of Policy Concerning Automated Vehicles." The Statement describes some of the broader changes that are occurring in vehicle technologies: (1) in-vehicle crash avoidance systems that provide warnings and/or limited automated control of safety functions; (2) self-driving vehicles; and (3) vehicle-to-vehicle (V2V) communications that support various crash avoidance applications. The Statement also describes the various levels of vehicle automation ranging from no automation to full self-driving automation and outlines our research plans. NHTSA has been actively involved in researching these advanced technologies.

In 2014, in response to legislation known as "Moving Ahead for Progress in the 21st Century" or "MAP-21," NHTSA outlined recent findings with respect to vehicle electronics and the security of those electronics. In addition, we sought comment on our electronics and cybersecurity research program that is aimed at addressing the most critical safety needs of vehicles. Public responses to that notice have informed the projects in this plan.

NHTSA is working cooperatively with other DOT agencies on this research. Initially, the agency has identified three key areas where it has begun or plans to conduct research on the more advanced automated vehicle systems: human factors research, development of system performance requirements and addressing electronic control system safety. These research areas are reflected in the projects listed in this priority plan.

In addition to research, we have begun to actively promote the most promising technologies through our NCAP program. For example, in 2015, we plan to add automatic emergency braking as a recommended technology to encourage consumers to seek this critical automation technology and give automakers an incentive to include it in large numbers of in their vehicles.

At the same time, NHTSA and other DOT agencies, in conjunction with the auto industry, have been conducting in-depth research and demonstration of V2V communications technology. In fact, NHTSA issued an Advance Notice of Proposed Rulemaking in August 2014, indicating its intention to require V2V capability in new vehicles in future years. NHTSA believes that V2V (and vehicle-to-infrastructure, vehicle-to-pedestrian, and related technologies) are critical to realization of the full potential of single-vehicle safety technologies, and that the future is one of connected automation.

Two additional technologies also offer great safety potential and are among our priorities. We continue to work with industry on research concerning the Driver Alcohol Detection System for Safety (DADSS), which could prevent a vehicle from being driven by a drunk driver and could help prevent or mitigate these crashes that kill over 10,000 people annually. Seat belt interlock technology could prevent a vehicle from being driven in a normal fashion (e.g., above a certain speed) when the driver and passengers are not safely buckled and could prevent some of the thousands of unbelted fatalities that continue to occur each year.

Yet even as we look to the future of advanced crash avoidance technologies, we continue to look for new and innovative ways to improve safety when crashes occur. These efforts include research and regulatory activities that seek to afford injury protection to occupants through new and improved vehicle design, materials and structures; as well as through passive and active restraints such as seat belts, air bags, child seats and motorcycle helmets. Research activities in crashworthiness include a frontal oblique test procedure consistent with real world crashes, an advanced 50th percentile male crash test dummy, a new brain injury criterion that measures head rotation of the test dummy to predict the risk of brain injury and advanced automatic collision notification for Emergency Medical Services when crashes occur. Crashworthiness activities are also responsive to anticipated changes in the vehicle fleet such as enhancing fleet system modeling efforts for evaluating the safety of future lightweight vehicle designs and developing test procedures for evaluating the safety of lithium ion battery systems used by hybrid and electric vehicles.

This plan contains the priority projects and activities within those projects, organized by program areas. As stated above, however, it is not a complete list of all projects in NHTSA's Office of Vehicle Safety and does not describe efforts in other NHTSA offices. Projects that

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

Our belief that some of these projects will have large safety benefits is based upon factors such as the size of the target population, the effectiveness of countermeasures 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 for a large target population. Projects also may be considered a priority because they affect children, older people, visually impaired persons or other populations that are considered vulnerable. Projects may be considered a priority because they affect high-occupancy vehicles (e.g., buses and motorcoaches). Finally, some priority projects and activities either reduce the impact of motor vehicles on energy and climate change or address other specific items (e.g., statutory mandates not fitting in any other category).

Milestones describing anticipated agency actions and expected dates are provided for almost all activities. Note that dates are given in calendar years, not fiscal years. The next action for projects that are in the research stage is often an "agency decision." In general, an agency decision is a determination about whether the project or activity is ready and worthy to move from the research stage into the rulemaking or consumer information stage, whether the project or activity requires further research, or whether the potential benefit does not warrant further expenditure of resources. This agency decision is based on many factors, including estimates of the target population, readiness of technology, potential effectiveness of countermeasures, development of a test protocol, what information remains unknown, other agency activities and available resources.

Projects in the plan are organized within the following program areas:

Data Improvement
Crash Avoidance and Automation
Electronics Reliability and Security
Pedestrian Safety
Crashworthiness and Post-Crash Safety
Fuel Efficiency and Alternative Fuels
Consumer Safety Information and Outreach

We hope the plan provides useful information to all who are interested in NHTSA's activities.

Daniel C. Smith
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Priority Projects and Activities

Data Improvement

NHTSA's traffic safety data provide the underpinning for informed vehicle and highway safety decision-making at the Federal, State and local levels. The National Center for Statistics and Analysis constantly seeks ways to improve the accuracy, accessibility, timeliness, and consistency of data as well as ways to better disseminate and leverage data.

Data Modernization

In the 2012 appropriation, NHTSA received funds to modernize the National Automotive Sampling System (NASS). The goal of the Data Modernization project is to develop a crash data system that meets current and future data needs. Based on its internal review and input from outside stakeholders, NHTSA is designing a new system that is flexible and scalable to efficiently and effectively accommodate the requirements. NHTSA will continue to make improvements to the data systems after NASS is replaced .

	Activities	*Milestone*	*Date*
1.	Update the sample design and data collected in the NASS General Estimates System with the new Crash Report Sampling System (CRSS).	Begin CRSS in up to 60 sites	2016
2.	Update the sample design and data collected in the NASS Crashworthiness Data Sysetm with the new Crash Investigation Sampling System (CISS).	Begin collection in up to 24 CISS site	2017
3.	Improve and modernize the information technology (IT) infrastructure for NASS and Fatality Analysis Reporting System.	Begin deployment of the consolidated IT investment	2015
4.	Investigate more efficient ways to collect data, especially through electronic means.	Pilot test Electronic Data Transfer	2015

Crash Avoidance and Automation

Vehicle-to-Vehicle Communications

Vehicle-to-Vehicle (or "V2V") communications technology would improve safety by allowing vehicles to communicate with each other and ultimately help drivers avoid many crashes altogether by exchanging basic safety-related data, such as speed and position, ten times per second. DOT research indicates that safety applications using V2V technology can address a large majority of crashes involving two or more motor vehicles. With safety data such as speed and location flowing from nearby vehicles, vehicles can identify risks and provide drivers with warnings to help them avoid other vehicles in common crash types such as rear-end, lane change, and intersection crashes. These safety applications have been demonstrated with everyday drivers under both real-world and controlled test conditions. NHTSA considers V2V an important complement to single-vehicle crash avoidance and vehicle automation technologies and an essential enabler of vehicle-to-infrastructure, vehicle-to-pedestrian and other important safety advances.

Light Vehicle V2V

In February 2014, NHTSA announced that it will begin taking steps to enable V2V communication technology for light vehicles. In August 2014, NHTSA released an advance notice of proposed rulemaking (ANPRM) and a supporting comprehensive research report on vehicle-to-vehicle (V2V) communications technology. The report includes analysis of the Department's research findings in several key areas including technical feasibility, privacy and security, and preliminary estimates on costs and safety benefits, while the ANPRM seeks public input on these findings to support the Department's regulatory work to eventually require V2V devices in new light vehicles.

	Activities	*Milestone*	*Date*
1.	Initiate rulemaking that would require V2V devices in new light vehicles.	Issue NPRM	2016

Heavy Vehicle V2V

NHTSA is also considering the benefits of V2V communication technology for heavy vehicles such as truck tractors, single-unit trucks and buses.

	Activities	*Milestone*	*Date*
1.	Complete research necessary to support an agency decision on heavy vehicle V2V.	Agency decision	2015

Vehicle Automation

Emerging automation technologies are part of a continuum of vehicle control. The continuum runs from vehicles with no active control systems all the way to full automation and self-driving. While the agency is conducting research along the entire continuum, our emphasis initially is on determining whether those crash avoidance and mitigation technologies that are currently available (or soon to be available) are not only safe but also effective. However, because these same technologies are the building blocks for driverless vehicles, we have also begun research focused on safety principles that may apply to even higher levels of automation, such as research on driver behavior in the presence of highly automated vehicle safety systems. The agency is excited about the safety potential of automated systems and committed to ensuring their safety.

Vehicle Automation Research

The automated vehicle program involves research that will support development of test procedures and assessment of benefits, inform agency policy decisions, assist in developing an overall set of requirements and standards for automated vehicles, identify any additional areas that require examination and build a comprehensive knowledge base for the agency as automated system technologies progress.

	Activities	*Milestone*	*Date*
1.	Examine potential benefits for different levels of automated vehicles.	Complete benefits framework	2015
2.	Develop automation roadmap.	Release roadmap	2016
3.	Research system performance, electronic control systems reliability and cybersecurity, and human factors driver-vehicle interface requirements to ensure safe transitioning between automated and manual driving modes.	Release of public reports	Ongoing

In-Vehicle Crash Avoidance

The in-vehicle crash avoidance program encompasses projects that focus on vehicle-based equipment, systems and technologies that help ensure that motor vehicles are optimally prepared to prevent crashes from occurring. These technologies are distinct from V2V because they only involve on-board equipment such as sensors or cameras that, unlike V2V, do not require communication between vehicles. This program includes in-vehicle crash avoidance systems that provide warnings and/or limited automated control of safety functions.

Heavy Vehicle Speed Limiters

NHTSA was petitioned by the American Trucking Association and Road Safe America to require the installation of speed limiting devices on heavy trucks.

	Activities	*Milestone*	*Date*
1.	Develop a coordinated NPRM with the Federal Motor Carrier Safety Administration.	Issue NPRM	2015

Heavy Vehicle Crash Avoidance Technologies

NHTSA has received a petition for rulemaking as well as NTSB recommendations concerning the application of a range of crash avoidance technologies to heavy trucks.

	Activities	*Milestone*	*Date*
1.	Evaluate the range of relevant technologies.	Agency decision	2016
2.	Complete research on heavy vehicle automatic emergency braking systems test procedures.	Publish test procedures	2016

Driver Impairment

Impaired driving represents a serious safety threat on the Nation's highways. While alcohol may be the biggest and most visible contributor to the safety problem, impairment also refers to operating a motor vehicle while affected by licit or illicit drugs or having a medical condition that degrades driving ability for some time. Similarly, inattention and secondary task related distractions may temporarily divert the driver from the primary tasks of controlling the vehicle and responding to critical events. NHTSA's Office of Vehicle Safety investigates how impairment affects driver performance and develops and evaluates vehicle-based countermeasures to minimize negative effects.

Driver Distraction Guidelines

The goal of NHTSA's Driver Distraction Guidelines is to encourage the safe operation of electronic devices so they will not be as distracting when drivers use them. Implementation of the guidelines, conformance with which is voluntary, is in three phases. Phase 1 was published in April 2013 and addressed visual-manual interfaces for devices built into light vehicles by original equipment manufacturers (OEMs). Phase 2 will address portable and aftermarket devices (PADs), and Phase 3 will focus on voice-based auditory interfaces.

	Activities	*Milestone*	*Date*
1.	Develop guidelines to extend the Phase 1 Distraction Guidelines on visual-manual distraction to PADs that are brought into the vehicle (Phase 2).	Publish proposed guidelines	2015
2.	Revise Phase 2 guidelines based upon public comment and publish final guidelines	Publish final guidelines	2016
3.	Begin research on auditory-vocal driver interfaces.	Initiate research	2016

Driver Alcohol Detection System for Safety (DADSS)

DADSS, a 5-year cooperative agreement between the Automotive Coalition for Traffic Safety and NHTSA, was launched in 2008 to research, develop, and demonstrate non-invasive in-vehicle alcohol detection technologies that can very quickly and accurately measure a driver's blood alcohol concentration (BAC). The agreement was renewed for another five years in 2013.

	Activities	*Milestone*	*Date*
1.	Develop prototype for a DADSS research vehicle.	Deliver integrated research vehicle	2015

Electronics Reliability and Security

Today's vehicles are heavily reliant on complex electronic control systems. A comprehensive understanding of reliability and security for automotive safety-critical electronic systems, especially vehicle control systems, is essential for the safe operation of motor vehicles and the protection of vehicle occupants and other road users.

Electronic Control Systems Reliability

With electronic systems assuming safety-critical roles in nearly all vehicle controls, NHTSA is facing the need to develop general requirements for electronic control systems to ensure their reliability. Reliability includes the areas of functional safety design, fail-safe strategies, software reliability, diagnostic and notification strategies, and human factors considerations. In October 2014, NHTSA published for public comment its research program on vehicle electronics and our progress on examining the need for safety standards. This Request for Comments satisfies the MAP-21 requirement to allow for public comment on our examination.

	Activities	*Milestone*	*Date*
1.	Complete MAP-21 required Report to Congress on the highest priority areas with regard to the need for safety standards for electronic systems in passenger vehicles.	Report to Congress	2015
2.	Complete research to support an agency decision on possible regulatory options for enhanced functional safety requirements for electronic control systems.	Agency decision	2016

Cybersecurity Research

The need to address vehicle cybersecurity includes quantifying and assessing the risks for an individual vehicle, V2V and automated systems as well as considering lessons learned from other industries. It also includes identification and evaluation of potential solutions and countermeasures as well as the need for standards.

	Activities	*Milestone*	*Date*
1.	Complete research supporting initial cybersecurity requirements and possible regulatory options.	Agency decision	2016
2.	Participate in automotive industry's sharing forum to ensure timely exchange of information concerning cybersecurity threats.	Attend and participate	Ongoing

Pedestrian Safety

The pedestrian safety program focuses on technologies and approaches designed to protect pedestrians from death and injury both on and off the Nation's roadways.

Pedestrian Collision Avoidance and Mitigation (PCAM)

Develop performance criteria and objective tests to support the identification of effective advanced safety technologies that provide automatic braking to mitigate or avoid an impending forward collision with a pedestrian.

	Activities	Milestone	Date
1.	Develop objective test procedures and mannequin for assessment of PCAM systems.	Agency decision	2016

Pedestrian Protection: Global Technical Regulation (GTR) No. 9

Develop a pedestrian head-to-hood requirement for head protection in pedestrian crashes and a leg-to-bumper requirement for lower extremity protection based on the GTR No. 9 test procedures. This GTR was established under the 1998 Global Agreement on Global Technical Regulations by the World Forum for the Harmonization of Vehicle Regulations (WP-29).

	Activities	Milestone	Date
1.	Develop a head-to-hood pedestrian safety requirement.	Issue NPRM	2016
2.	Develop a leg-to-bumper pedestrian safety requirement.	Issue NPRM	2017

Sound for Hybrid and Electric Vehicles

This rulemaking would respond to The Pedestrian Safety Enhancement Act of 2010, which directs the Secretary of Transportation to study and establish a motor vehicle safety standard that provides for a means of alerting blind and other pedestrians of approaching hybrid and electric vehicles. NHTSA published an NPRM in January 2013. NHTSA actively participates in the Quiet Road Transport Vehicles Informal Working Group for a Global Technical Regulation and is a co-sponsor of this proposed GTR.

	Activities	Milestone	Date
1.	Develop final rule.	Issue final rule	2015
2.	Issue Report to Congress on the need for sound specifications for internal combustion engines.	Report to Congress	2016

Crashworthiness and Post-Crash Safety

Safety Systems

The safety systems program focuses on protecting the occupant once a crash occurs. The program is responsible for developing and upgrading performance requirements and test procedures for evaluating motor vehicle safety in order to reduce the number of fatal and serious injuries that occur in motor vehicle crashes each year. The program encompasses research and regulatory activities that seek to afford injury protection to occupants through new and improved vehicle design, materials and structures; as well as through passive and active restraints (such as seat belts and air bags), child restraint systems and motorcycle helmets.

Oblique Frontal Crashes for Light Duty Vehicles

Develop a frontal oblique test procedure that is consistent with real-world crashes of this type.

	Activities	*Milestone*	*Date*
1.	Determine the anticipated costs, benefits, and effectiveness of potential countermeasures.	Agency decision	2015

Seat Belt Interlocks

NHTSA recently acquired statutory authority to allow consideration of seat belt interlocks as a compliance option under FMVSS No. 208. The agency will initiate a research program to fully evaluate the safety need, benefits, effectiveness and relative acceptability of different types of seat belt interlock systems.

	Activities	*Milestone*	*Date*
1.	Begin consumer testing of prototype.	Initiate testing	2015
2.	Determine benefits and effectiveness of interlock systems and the safety implications for belted and unbelted occupants of allowing the introduction of those systems as a compliance option.	Agency decision	2016

Seat Belt Reminder Systems

Currently, seat belt reminder systems are only required for the driver's seat. This rulemaking would propose to require a seat belt reminder system for the front passenger seats and for rear designated seating positions in passenger vehicles. The seat belt reminder system is intended to increase belt use and thereby improve the crash protection of vehicle occupants who would otherwise have been unbelted.

	Activities	*Milestone*	*Date*
1.	Propose amendments to FMVSS No. 208, "Occupant crash protection," to require seat belt reminder systems for rear and front passengers.	Issue NPRM	2015

Motorcoach Crashworthiness and Post-Crash Safety

In 2012, DOT published an update to its original Motorcoach Safety Action Plan to document the Department's accomplishments since 2009 as well as provide information on in-process activities and new commitments NHTSA and other agencies have made to improve the safety of motorcoach passengers. NHTSA issued a final rule in 2013 to require seatbelts on new motorcoaches and a final rule in 2015 to require electronic stability control on new motorcoaches. In 2014 NHTSA issued a NPRM to establish a new FMVSS to improve the structural integrity of motorcoaches and other large buses in rollover events. NHTSA is also developing a proposal for advanced glazing and window retention.

	Activities	*Milestone*	*Date*
1.	Finalize new rollover structural integrity requirements that mitigate excessive structural deformation and intrusion in rollover events.	Issue final rule	2015
2.	Propose regulations to ensure that all windows and latches are able to withstand the loading of an occupant during a rollover.	Issue NPRM	2016

Heavy Truck Underride Guards

In 2014 NHTSA granted part of a petition for rulemaking submitted by Ms. Marianne Karth and the Truck Safety Coalition requesting that the agency improve the safety of rear impact (underride) guards on trailers and single unit trucks. Based on the petition, available information, and the agency's analysis in progress, NHTSA decided that the request related to rear impact guards merits further consideration.

	Activities	Milestone	Date
1.	Upgrade underride protection for single-unit trucks.	Issue ANPRM	2015
2.	Upgrade rear impact guard requirements FMVSS No. 223, "Rear impact guards," and FMVSS No. 224, "Rear impact protection," for trailers to enhance rear impact protection.	Issue NPRM	2015

Noncompliant or "Novelty" Motorcycle Helmets

MAP-21 clarified that helmets having the apparent purpose of protecting motorcyclists are "motor vehicle equipment." In response, this rulemaking would clarify that "novelty" helmets are subject to the existing performance requirements of FMVSS No. 218, "Motorcycle helmets," and describe certain criteria to help state and local law enforcement more readily identify and interdict novelty helmets whose physical characteristics indicate they cannot meet those requirements.

	Activities	Milestone	Date
1.	Amend FMVSS No. 218 to add definitions, requirements, and associated test procedures that would identify noncompliant helmets.	Issue final rule	2017

Make Child Restraint Anchorage Systems Easier to Use

MAP-21 directs the Secretary to "initiate a rulemaking proceeding to amend Federal Motor Vehicle Safety Standard Number 225 (relating to child restraint anchorage systems) to improve the ease of use for lower anchorages and tethers in all rear seat seating positions if such anchorages and tethers are feasible." This project would address issues related to using lower anchors and tethers for child restraints (LATCH) in the center rear seat, tether anchorage locations and labeling of anchorage locations.

	Activities	Milestone	Date
1.	Finalize amendments to FMVSS No. 225, "Child restraint anchorage systems" and FMVSS No. 213, "Child restraint systems," to make the LATCH systems easier to use.	Issue final rule	2016

Child Restraints in Side and Frontal Impacts

MAP-21 directs the Secretary to improve the protection of children seated in child restraint systems during side and frontal crashes. One rulemaking includes side impact performance requirements, a side impact test procedure, and the use of a new side impact dummy in FMVSS No. 213, Child Restraint Systems, to evaluate the performance of child restraint systems in side impacts. An NPRM was issued in January 2014. For frontal impacts, MAP-21 directs the Secretary to "amend the standard seat assembly specifications under Federal Motor Vehicle Safety Standard Number 213 to better simulate a single representative motor vehicle rear seat." This rulemaking would propose enhancements to the test parameters of the FMVSS No. 213 frontal sled test.

Track		*Milestone*	*Date*
1.	Finalize test procedures in FMVSS No. 213 to assess child restraint performance in near-side impacts using a new 3-year-old child side impact dummy.	Issue final rule	2016
2.	Complete an NPRM to amend FMVSS No. 213, "Child restraint systems" frontal sled test.	Issue NPRM	2016

Biomechanics and Human Injury

Our biomechanics and human injury program allows us to develop critical scientific links between vehicle crash characteristics and the resulting human injuries. To accomplish this, the science of impact biomechanics is applied in developing the required knowledge of injury mechanisms, tolerances and responses that can be applied in predicting injury risk in crashes. This knowledge enables the development and application of test devices, such as crash test dummies and computer models that can accurately mimic human response.

Test Device for Human Occupant Restraint (THOR) 50th Percentile Male Crash Dummy

The THOR 50th percentile male is an advanced frontal anthropomorphic test device (ATD) developed to improve biofidelity and injury prediction capabilities.

	Activities	*Milestone*	*Date*
1.	Decide whether to initiate rulemaking to include the dummy in Part 572.	Agency decision	2015

Brain Injury Criterion (BrIC)

NHTSA has developed a new brain injury criterion (BrIC) that measures head rotation of the test dummy to predict the risk of brain injury.

	Activities	*Milestone*	*Date*
1.	Decide whether to utilize BrIC in a future rulemaking.	Agency decision	2015

Post-Crash Safety

The post-crash safety program seeks to minimize the harm of motor vehicle crashes to occupants, non-occupants, first responders and others by employing technologies to enhance crash data collection and inform emergency responder triage.

Light Vehicle Event Data Recorder (EDR) Requirement

NHTSA published a NPRM in December 2012 to establish a new FMVSS to mandate the installation of EDRs in light vehicles. The NPRM proposed incorporating current reporting requirements of voluntarily-installed EDRs in light vehicles. The NPRM did not modify any of the Part 563 data elements, data capture and format requirements, data retrieval specifications, or data survivability and crash test requirements.

	Activities	*Milestone*	*Date*
1.	Complete final rule for event data recorder requirements.	Issue final rule	2015

Advanced Automatic Collision Notification (AACN)

NHTSA has supported research to quantify how earlier crash notification and better identification of serious crashes as identified using AACN and telematics data can be applied towards saving lives. This research has included evaluations and demonstrations of how AACN crash severity related data can be transmitted to end users (9-1-1, EMS, hospitals) and applied as part of updated medical response protocols. Remaining research includes the definition and demonstration of test protocols to evaluate AACN system performance in crash tests.

	Activities	*Milestone*	*Date*
1.	Decide whether, and how best, to encourage or require AACN systems.	Agency decision	2015

Fuel Efficiency and Alternative Fuels

Fuel Economy and Efficiency

First mandated by Congress in 1975, the Corporate Average Fuel Economy (CAFE) standards seek to reduce energy consumption by increasing the fuel economy of motor vehicles. NHTSA's fuel economy program now includes the light-duty and medium-duty passenger vehicle CAFE program and the medium- and heavy-duty fuel efficiency program.

Medium- and Heavy-Duty Fuel Efficiency Phase 2 Standards

The rulemaking would build on the first-ever fuel efficiency and greenhouse gas emission standards for medium- and heavy-duty vehicles. The standards, which cover Model Years 2014-2018, were finalized by NHTSA and the Environmental Protection Agency (EPA) in 2011.

	Activities	Milestone	Date
1.	Establish post-2018 fuel efficiency standards for medium- and heavy-duty on-highway vehicles and work trucks.	Issue final rule	2016

CAFE Standards for MY 2022-2025

In 2012 NHTSA set standards for MY 2017 to 2021 to increase CAFE levels rapidly over those years, thereby improving our nation's energy security and saving consumers money at the pump. This rulemaking would address CAFE standards for light trucks and for passenger cars for model years 2022 – 2025.

	Activities	Milestone	Date
1.	Complete, with EPA, the Technical Assessment Report (TAR) to support the mid-term review.	Complete TAR	2016

Compatibility and Light Weighting – Fleet Modeling Analysis

NHTSA will continue to enhance fleet system modeling efforts to evaluate safety considerations for future lightweight vehicle designs.

	Activities	Milestone	Date
1.	Develop new finite element vehicle models to use in fleet analysis of lightweight vehicles.	Complete models	2016

Tire Fuel Efficiency

NHTSA will establish a national tire fuel efficiency consumer information program for replacement tires designed for use on motor vehicles in response to requirements of the Energy Independence and Security Act of 2007. In 2010 NHTSA published a final rule specifying the test procedures to be used to rate the performance of replacement passenger car tires for this new program. The second part of this rulemaking activity will address how this information would be made available to consumers.

	Activities	*Milestone*	*Date*
1.	Propose second part of the consumer information program for replacement tires.	Issue SNPRM	2015

Alternative Fuels

Many manufacturers are heavily investing for near-future production and marketing of alternative-fuel vehicles. These include electric vehicles, hybrids, fuel cells, compressed and liquid natural gas, liquid propane, and hydrogen. As these vehicles are deployed in the fleet, their safety during refueling, recharging, and in crashes become issues of concern. Ensuring that alternative-fuel vehicles attain a level of safety comparable to that of other vehicles requires extensive research due to the many advanced and unique technologies that have previously not been tested in the transportation environment.

Batteries

NHTSA will conduct research in support of domestic and international efforts to develop safety performance requirements for emerging battery systems to propel vehicles. This will include support of activities related to electric vehicles under the World Forum for the Harmonization of Vehicle Regulations (WP-29) Program of Work of the 1998 Global Agreement on Global Technical Regulations (GTR).

	Activities	*Milestone*	*Date*
1.	Conduct research required for the development of procedures for evaluating the safety of lithium ion battery systems and requirements for their safe diagnosis and discharge.	Complete research	2015
2.	Decide on next steps based upon research.	Agency decision	2015

Hydrogen Fuel Cell

At the WP-29 in June 2013, the United States, under the 1998 agreement, voted to establish the GTR for hydrogen and fuel cell vehicles (GTR 13). Pursuant to that agreement, NHTSA is developing a proposal to incorporate the hydrogen and fuel cell vehicle GTR into the Federal standards.

	Activities	*Milestone*	*Date*
1.	Propose hydrogen and fuel cell vehicle safety regulations.	Agency decision	2015

Consumer Safety Information and Outreach

With its consumer safety information programs, NVS seeks to empower consumers to make educated purchases of motor vehicles and associated equipment and to give vehicle and equipment manufacturers an incentive to create safer products. NVS also aims to provide useful and timely consumer information related to the identification, notification, and completion of safety recalls.

New Car Assessment Program (NCAP)

To improve effectiveness of NCAP in the face of evolving safety technologies, the agency has periodically updated the program, most recently for model year 2011. In April 2013, the agency published a notice requesting public comments to help identify areas for improvement to the NCAP program that have the greatest potential for producing safety benefits. And in January 2014, NHTSA requested public comment on the plan to recommend to consumers various vehicle models that are equipped with automatic emergency braking (AEB) systems, which can enhance the driver's ability to avoid or mitigate rear-end crashes.

	Activities	Milestone	Date
1.	Finalize agency decision notice formalizing minimum performance criteria for AEB systems included in NCAP.	Issue notice	2015
2.	Request public comments on NCAP improvements.	Issue request for comments	2015
3.	Finalize agency decision notice on NCAP improvements.	Issue notice	2016

Increase Recall Completion Rates

NHTSA published a final rule in August 2013 that requires certain vehicle manufacturers to provide the public a means to search for open recalls by Vehicle Identification Number (VIN) on the Internet. NHTSA also deployed the first iteration of its SAFERCAR mobile application in March 2013 that allows consumers to receive real time notification of new recalls, search for recalls and complaints and file defect complaints. These are part of NHTSA's larger efforts to inform consumers about recalls and to ultimately increase recall completion rates.

	Activities	Milestone	Date
1.	Conduct consumer outreach campaign.	Launch campaign	2016

Office of Defects Investigation (ODI) Process and Organizational Enhancements

NHTSA has identified and begun to implement changes in its defects investigation process and organization that will enhance its ability to identify safety defects sooner, particularly those involving significant risk, and get recalls implemented sooner.

	Activities	Milestone	Date
1.	Implement process and organizational enhancements.	Implement changes	Ongoing