



National Highway Traffic Safety Administration

Research Overview

January 27, 2011



Agenda

NHTSA/NVS Overview

Strategic Planning Process

Research Overview





KEY PROGRAMS

NHTSA/NVS OVERVIEW

STRATEGIC PLANNING PROCESS

RESEARCH OVERVIEW

|| NHTSA's Missions

Safety

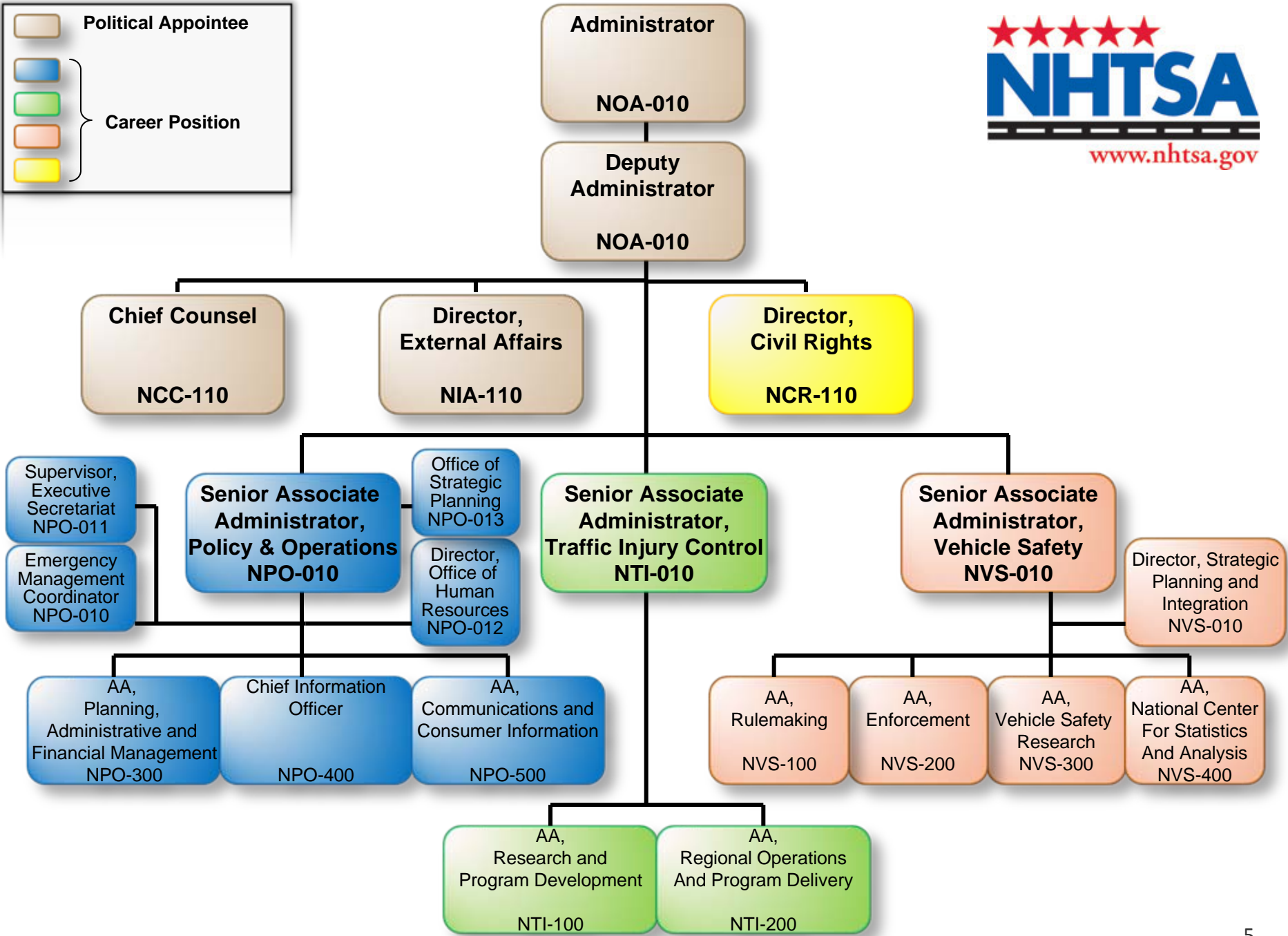
Save lives, prevent injuries and reduce economic costs due to road traffic and non-traffic crashes through education, research, safety standards and enforcement activity.

Consumer Programs

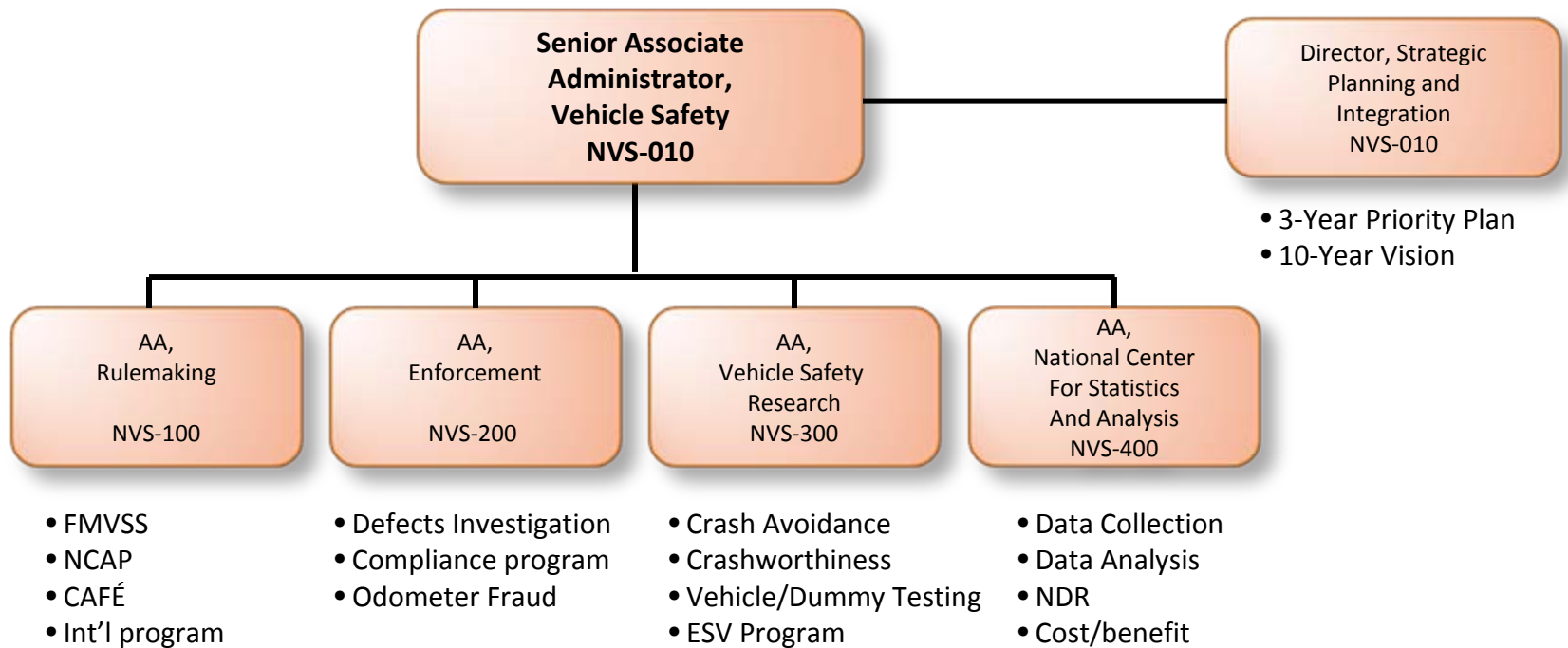
Increase fuel economy, damageability protection, and theft protection, reduce odometer tampering, and provide consumer information.



	Political Appointee
	Career Position



Vehicle Safety - NVS



Strategic
Planning

Research

Data

Enforcement

Rulemaking

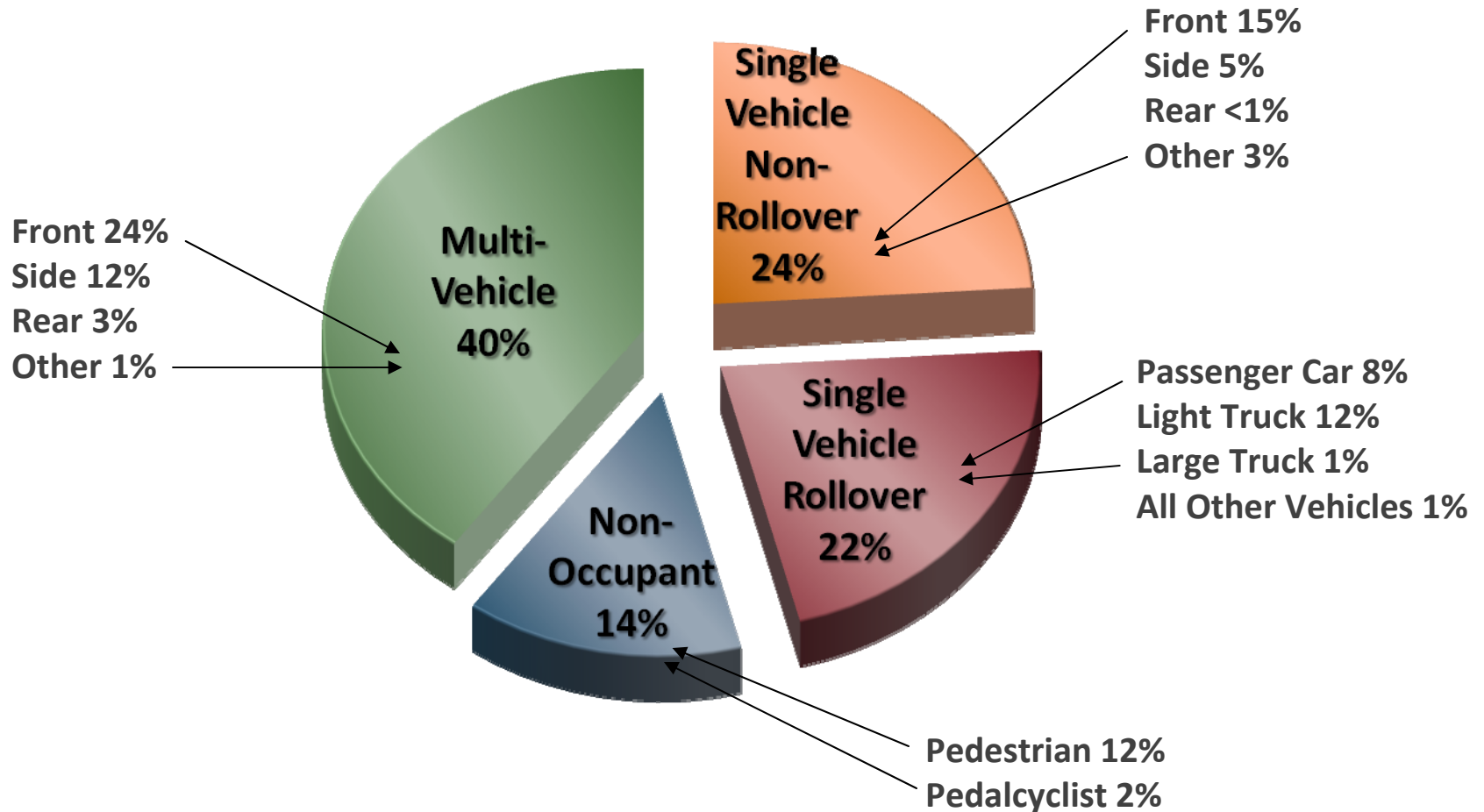
NVS Process and Organizational Relationship



NVS Process and Organizational Relationship



Fatalities in Motor Vehicle Traffic Crashes 2009





KEY PROGRAMS

NHTSA/NVS OVERVIEW

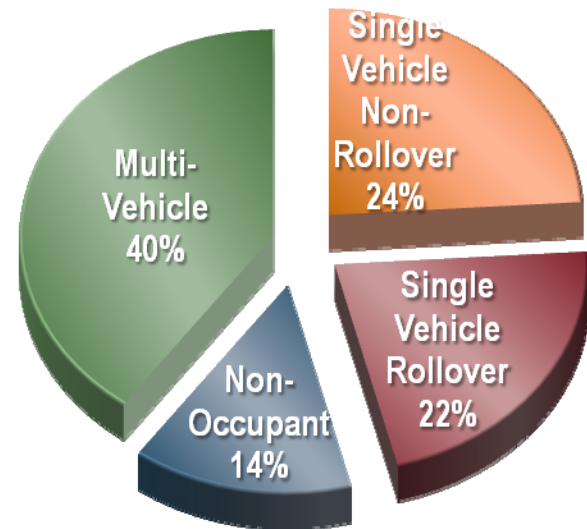
STRATEGIC PLANNING PROCESS

RESEARCH OVERVIEW



Data Driven

- NHTSA's research and rulemaking decisions are data driven
- These data are analyzed in various perspectives
 - Vehicle type
 - Crashworthiness
 - Crash avoidance
 - Crash partners
 - Body region injured
 - Societal costs





Strategic Planning Process

- 10 year vision – periodic review
- Develop 3 year priority plan
- And-
- Develop 3-5 year longer- term Research Plans



Major Focus Areas

- **Crash Avoidance**
 - focus is saving lives and reducing injuries by preventing crashes in the first place
 - Also reduces property damage and traffic congestion resulting from most crashes
 - These are among our highest priority projects
- **Crashworthiness**
 - focus is mitigating the consequences of a crash
- **Post-crash Response**
 - focus is coordinating with emergency services to minimize severity of crash-related injuries



Priority Categories

- Priority projects fall into the following categories
 - Large safety benefit
 - Vulnerable populations
 - High-occupancy vehicles
 - Other considerations
 - Projects not captured in other categories, but either reduce the impact of motor vehicles on energy security or address other specific items



Priority Dynamics

- Events may influence NHTSA's priority agenda
 - Petitions that require action
 - Congressional mandates
 - Additional and/or different priorities set by the Administration
 - Insights from on-going data analyses
 - Some safety-related event may occur



Near-Term Priorities Related to Electronics

- Light Vehicle Forward Collision Avoidance and Mitigation
- Light Vehicle EDRs
- Vehicle Communications
- Driver Distraction
- Ejection Mitigation
- Heavy Vehicle Stability Control
- Heavy Vehicle Forward Collision Avoidance and Mitigation
-



KEY PROGRAMS

NHTSA/NVS OVERVIEW

STRATEGIC PLANNING PROCESS

RESEARCH OVERVIEW

Research Program Philosophy

Mission: Strategize, plan, and implement research programs to continually further Agency's goals in reduction of fatalities and injuries

- **Aligned with DOT & NHTSA goals**
- **Primarily focused on regulatory outcomes**
 - But with some continuing component of exploratory & innovative “basic” research
- **Prioritized based on potential for fatality/injury reductions**
 - With consideration for special populations and risk scenarios
- **Collaborative**



Program Approach

- **With guidance from the 3-Year Priority Plan, and 10-Year Strategic Vision,**
 - **Create strategic Program Plans & Roadmaps**
 - *With outcomes aimed at regulatory decisions & implementation*
 - *And execute them*
 - **Examples:**
 - Motorcoach Safety Plan
 - V2V Roadmap
 - Distraction Plan
 - Bio Plan
 - Alternative Energy Vehicle Safety Plan
 - V2I Roadmap
 - Human Factors for V2V and V2I Roadmaps
 -
 - Crashworthiness Plan
 - Elderly Occupant Plan
 -
- } under development*

Crash Avoidance

Crashworthiness

PRE - CRASH

CRASH
EVENT

POST-
CRASH



Crash Avoidance

Crashworthiness

NORMAL
DRIVING

CRASH
IMMINENT

CRASH
EVENT

POST-
CRASH



Crash Avoidance

Crashworthiness

	NORMAL DRIVING	CRASH IMMINENT	CRASH EVENT	POST-CRASH
PASSENGER CARS/TRUCKS	<ul style="list-style-type: none"> • Driver Distraction • Driver Support Systems • Blind Spot Detection • Alcohol Detection • Drowsy Driver Detection •... 	<ul style="list-style-type: none"> • Forward Crash Warning • Lane Departure Warning • Automatic Braking • Lane Keeping • Advanced Airbags • V2V & V2I •.... 	<ul style="list-style-type: none"> • Dynamic Rollover • Oblique/Off-set Frontal • Adaptive Restraints • Child Side Impact • Elderly Occupants • 	<ul style="list-style-type: none"> • Auto Crash Notification • Advanced ACN • Medical Outcome (CIREN) • First Responder Safety
HEAVY VEHICLES - Truck/Bus	<ul style="list-style-type: none"> • Driver Distraction • Drowsy Driver Detection • Enhanced Vision Systems • Blind Spot Detection 	<ul style="list-style-type: none"> • ESC/RSC • Forward Collision Warning • Lane Change Warning • Automatic Braking • Lane Keeping • V2V & V2I 	<ul style="list-style-type: none"> • Underride 	
MOTORCYCLES	<ul style="list-style-type: none"> • Conspicuity 	<ul style="list-style-type: none"> • ABS/CBS • V2V 	<ul style="list-style-type: none"> • Helmet Use • Airbags 	<ul style="list-style-type: none"> • ACN?
PEDESTRIANS	<ul style="list-style-type: none"> • Quiet Car Detection • Lighting Systems for Peds 	<ul style="list-style-type: none"> • Pedestrian Warning • Automatic Braking • P2V 	<ul style="list-style-type: none"> • GTR – Hoods / Bumpers 	<ul style="list-style-type: none"> • ACN?

Crash Avoidance

Crashworthiness

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BATTERY ELECTRIC VEHICLES	<ul style="list-style-type: none"> • Charging Safety • Lithium Ion Battery 		<ul style="list-style-type: none"> • Lithium Ion Battery • Electrical Isolation 	<ul style="list-style-type: none"> • First Responder Safety
ELECTRONICS RELIABILITY & SECURITY	<ul style="list-style-type: none"> • Fail-Safe Strategies • Software Reliability • Fault Detection & Reporting 	<ul style="list-style-type: none"> • Control System Management Strategies 	<ul style="list-style-type: none"> • Control System Management Strategies 	<ul style="list-style-type: none"> • Electronic Data Recorders

Crash Avoidance

Crashworthiness

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Research in Electronics

- Potential Research Needs
 - Electronics Reliability
 - Fail Safe Strategies
 - Diagnostic Strategies and Trouble Codes
 - Software Design and Validation
 - Driver Awareness/Shared Control
 - Cyber-security
- Possible Facilities & Testing
 - System Analysis Tools
 - Software Modeling Tools
 - Forensic Tools
 - EMC Chambers?
 - Others?