The Safe System Approach and Opportunities to Save Lives on Nevada's Roadways

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9/6/2023

TOTAL LIVES LOST YTD:

209 ↓ 11%

DOWN 11.44% FROM LAST YEAR

FATALITIES

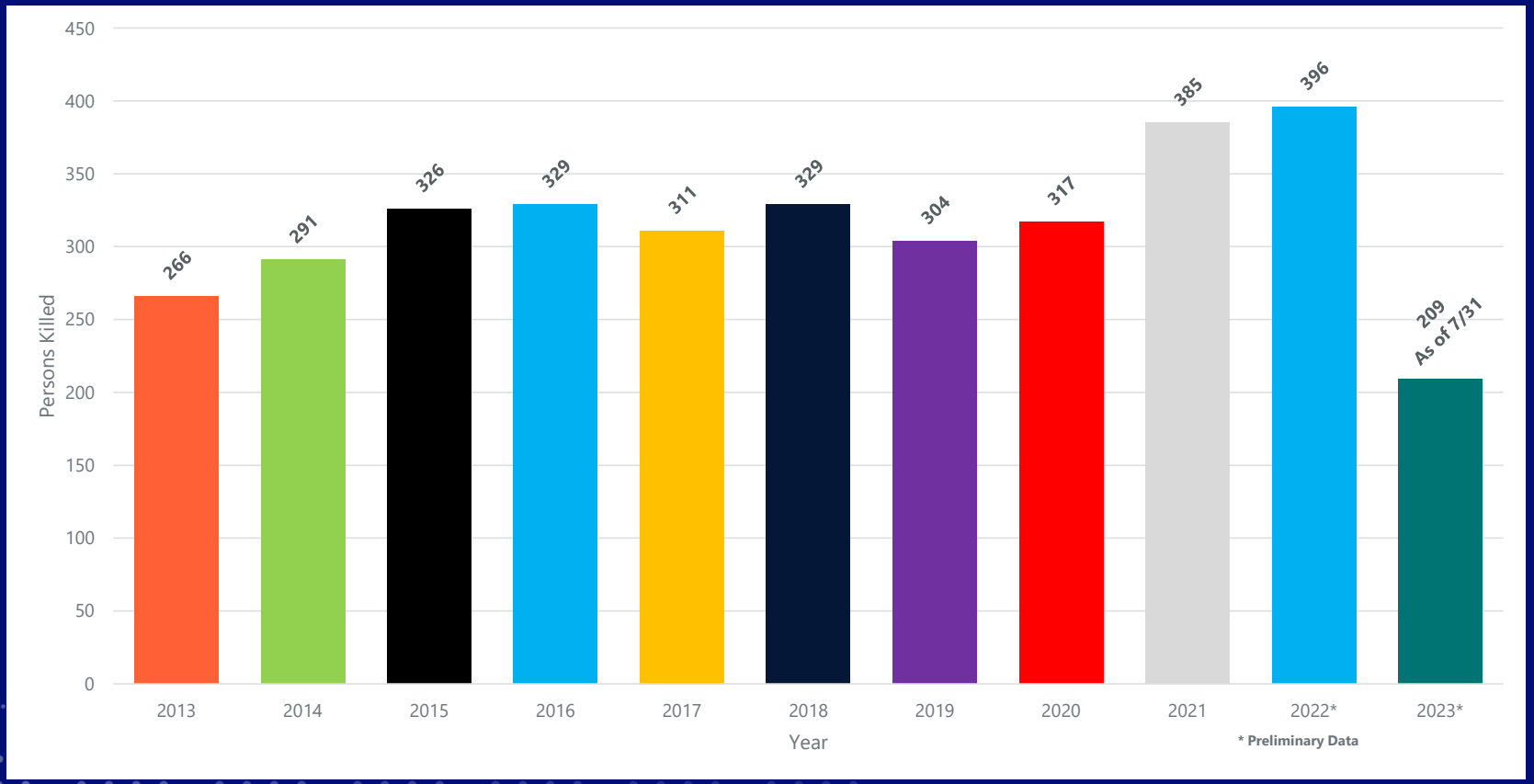
PEDESTRIANS
53

UNRESTRAINED MOTORISTS
34

TOP CONTRIBUTING FACTORS:
IMPAIRMENT & SPEEDING

DATA AS OF 8/1/2023

Lives Lost on Nevada's Roadways



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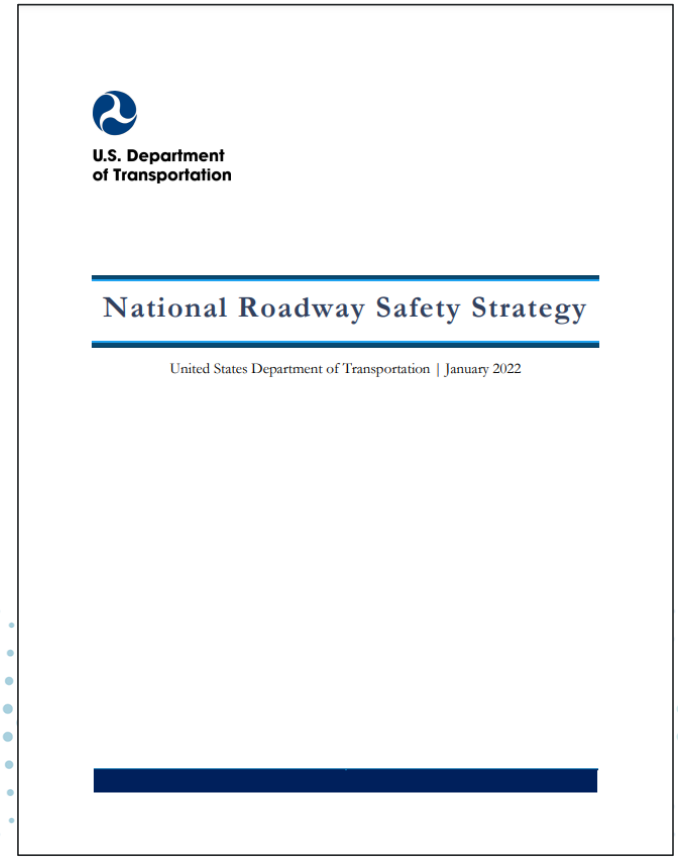
National Roadway Safety Strategy

National Roadway Safety Strategy (NRSS)

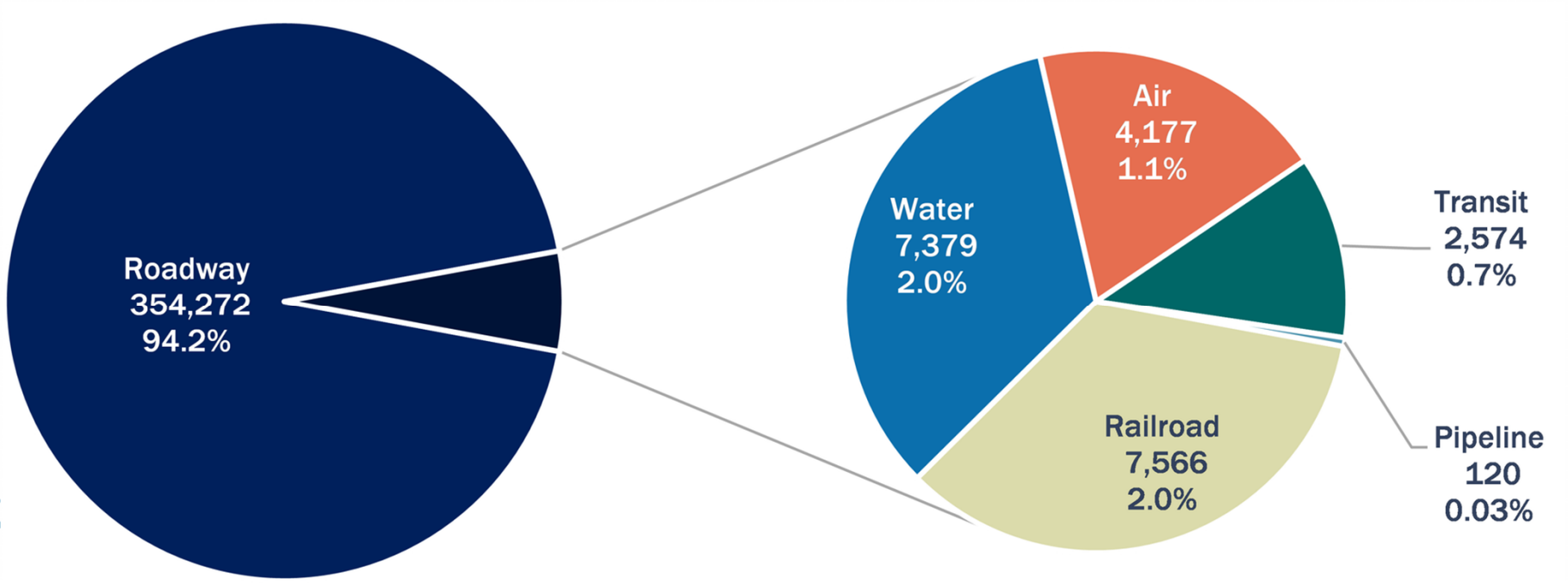


- January 2022 U.S. DOT released the NRSS
- In 2023 the U.S. DOT released a one-year update on the efforts
- Information about the NRSS if from the U.S.DOT and can be found at: https://www.transportation.gov/NRSS

What is the NRSS?

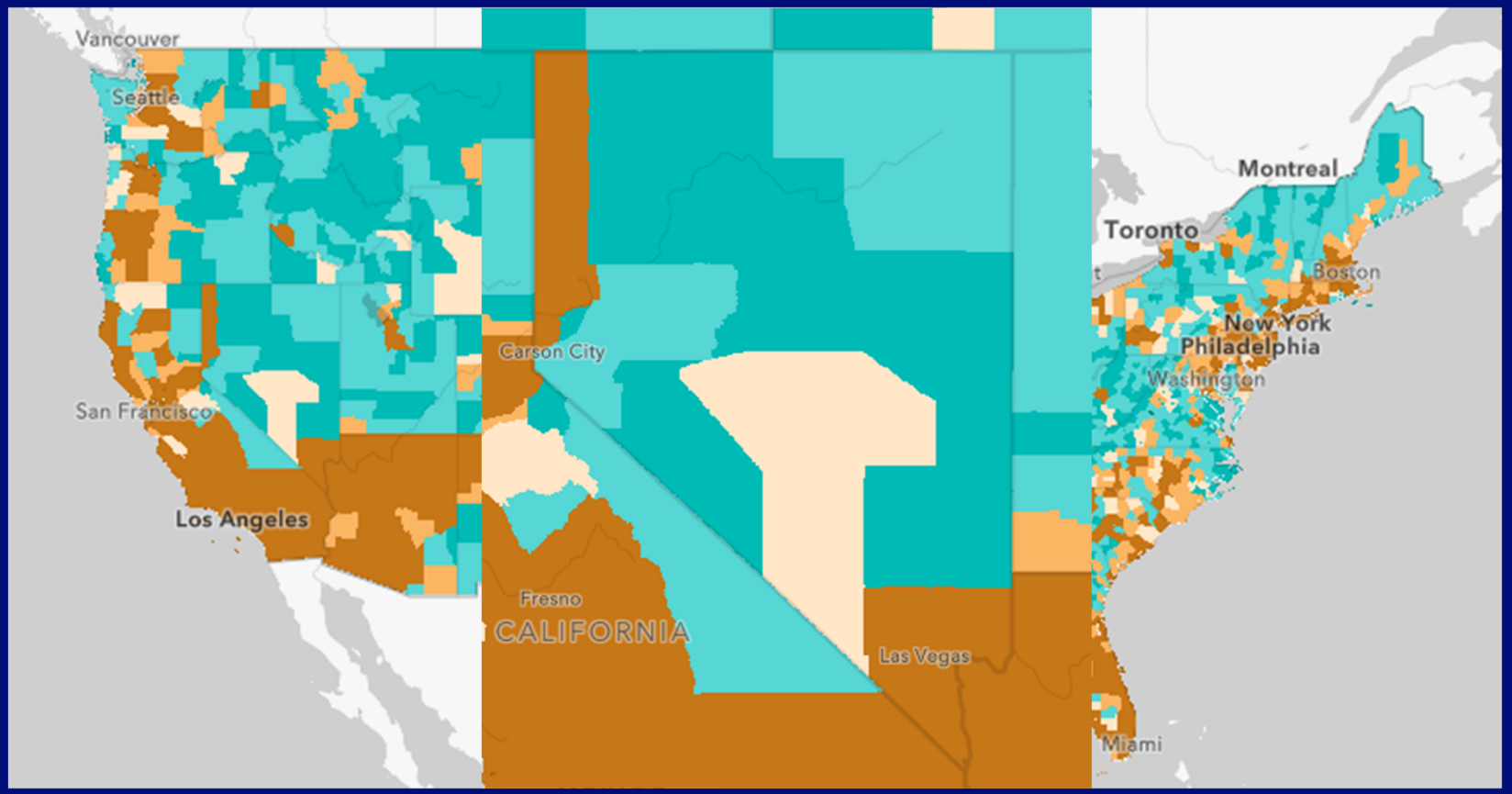
- U.S. DOT's comprehensive approach to significantly reduce fatalities and serious injuries
- First step in reaching long-term goal of zero fatalities
- Represents a Department-wide approach to working with stakeholders across the county to achieve this goal

The Roadway Safety Problem



Source: Bureau of Transportation Statistics

The Roadway Safety Problem Data Visualization



Source: transportation.gov/NRSS/SafetyProblem

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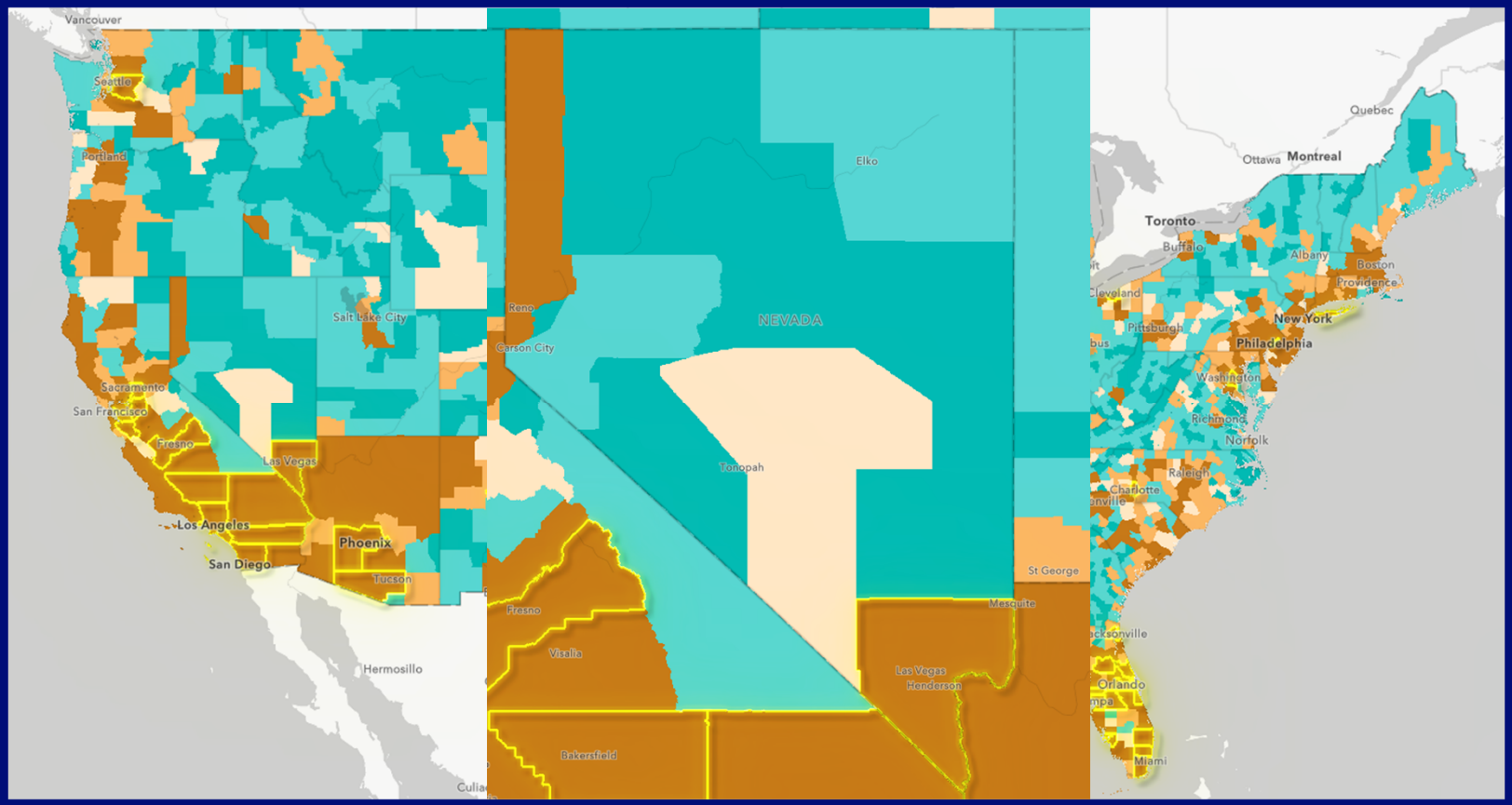
The Top 50 Counties in the Nation



The top 50 counties with the highest fatalities in the country account for 24% of all fatalities.

Source: transportation.gov/NRSS/SafetyProblem

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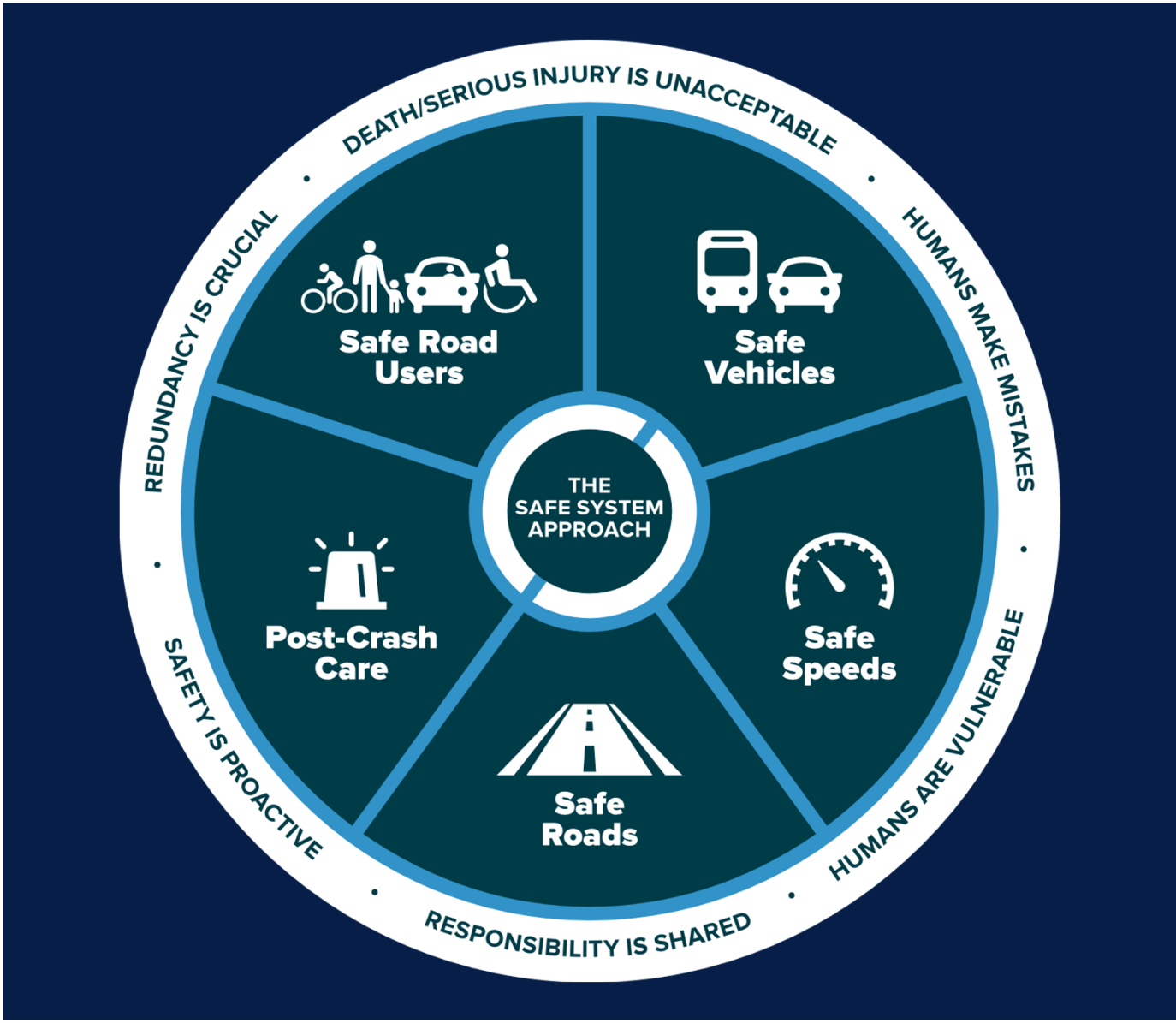
The Safe System Approach



The 6 Safe Systems Principles

Death/serious injury is unacceptable

Humans make mistakes

Humans are vulnerable

Responsibility is shared

Safety is proactive

Redundancy is crucial

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The 5 Safe Systems Elements

Safe road users

Safe vehicles

Safe speeds

Safe roads

Post-crash care

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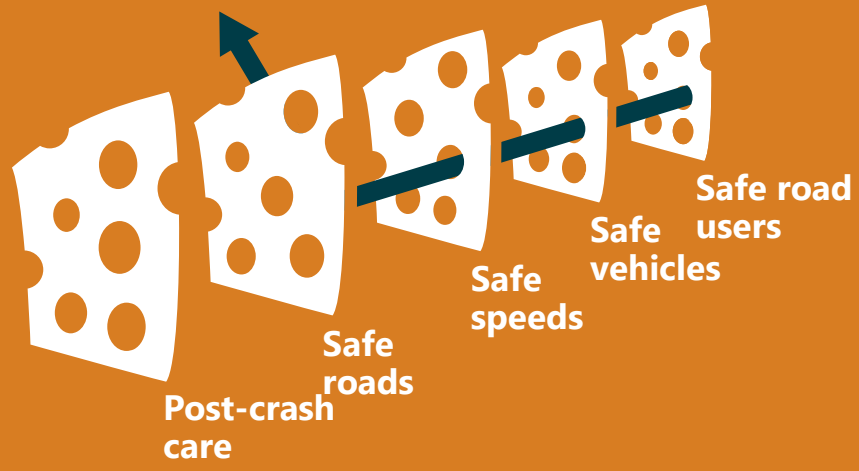
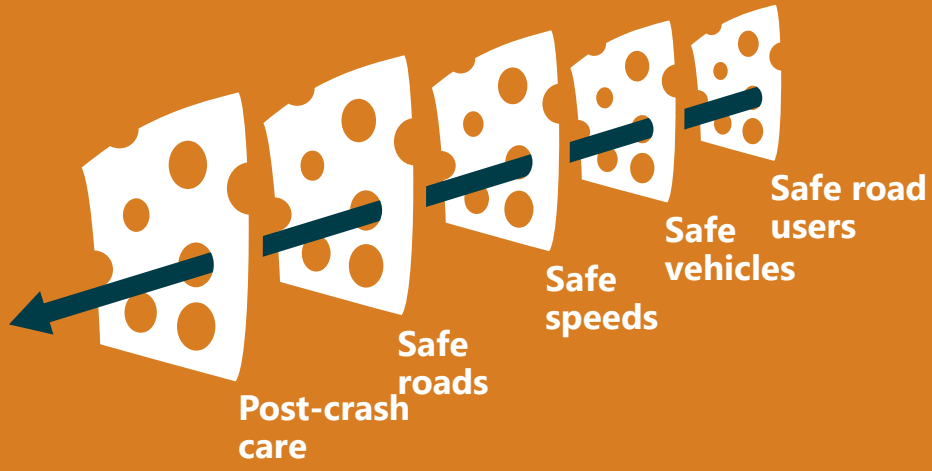
The 5 Safe System Elements Create Redundancy

The "Swiss Cheese Model" of redundancy creates layers of protection



Death and serious injuries only happen when all layers fail



Source: FHWA

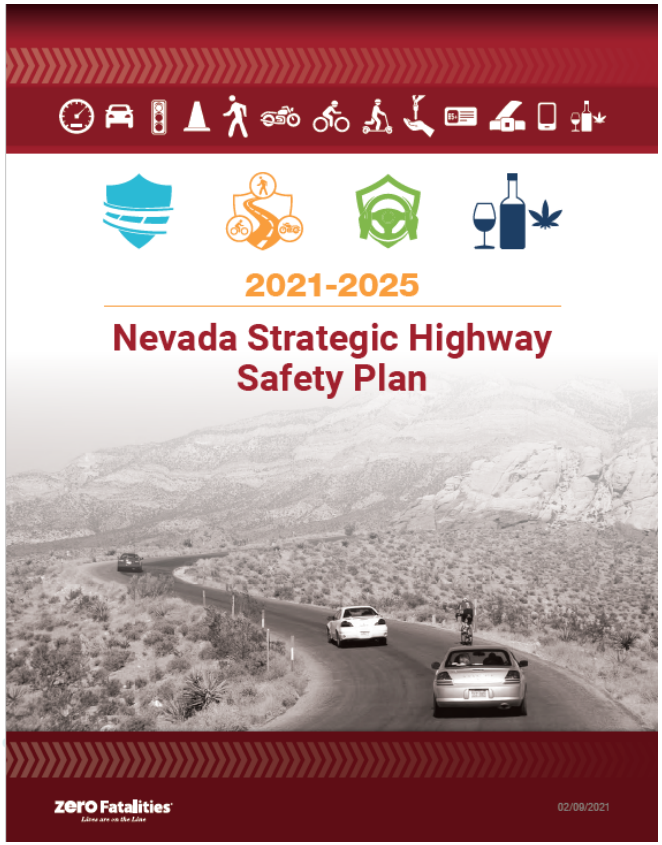
Changes in Approach

Traditional approach		Safe System approach
Prevent crashes	→	Prevent death and serious injuries
Improve human behavior	→	Design for human mistakes/limitations
Control speeding	→	Reduce system kinetic energy
Individuals are responsible	→	Share responsibility
React based on crash history	→	Proactively identify and address risks

Nevada's Strategic Highway Safety Plan

SHSP Overview

- Background
- What's New
  - Guiding Principles
  - 6 "Es" of Traffic Safety
  - SHSP Structure



Background

- Comprehensive Statewide Safety Plan
- Identifies greatest causes of fatalities and serious injuries
- Coordinated framework of strategies and action steps for reducing crashes
- Nevada's Goal: Zero Fatalities by 2050

Guiding Principles

- Incorporate Equity
- Prioritize Safe Speed
- Double Down on What Works
- Accelerate Advanced Technology

6 “Es” of Traffic Safety

- Equity
- Engineering
- Education
- Enforcement
- Emergency Response
- Everyone

SHSP Structure – Key Areas

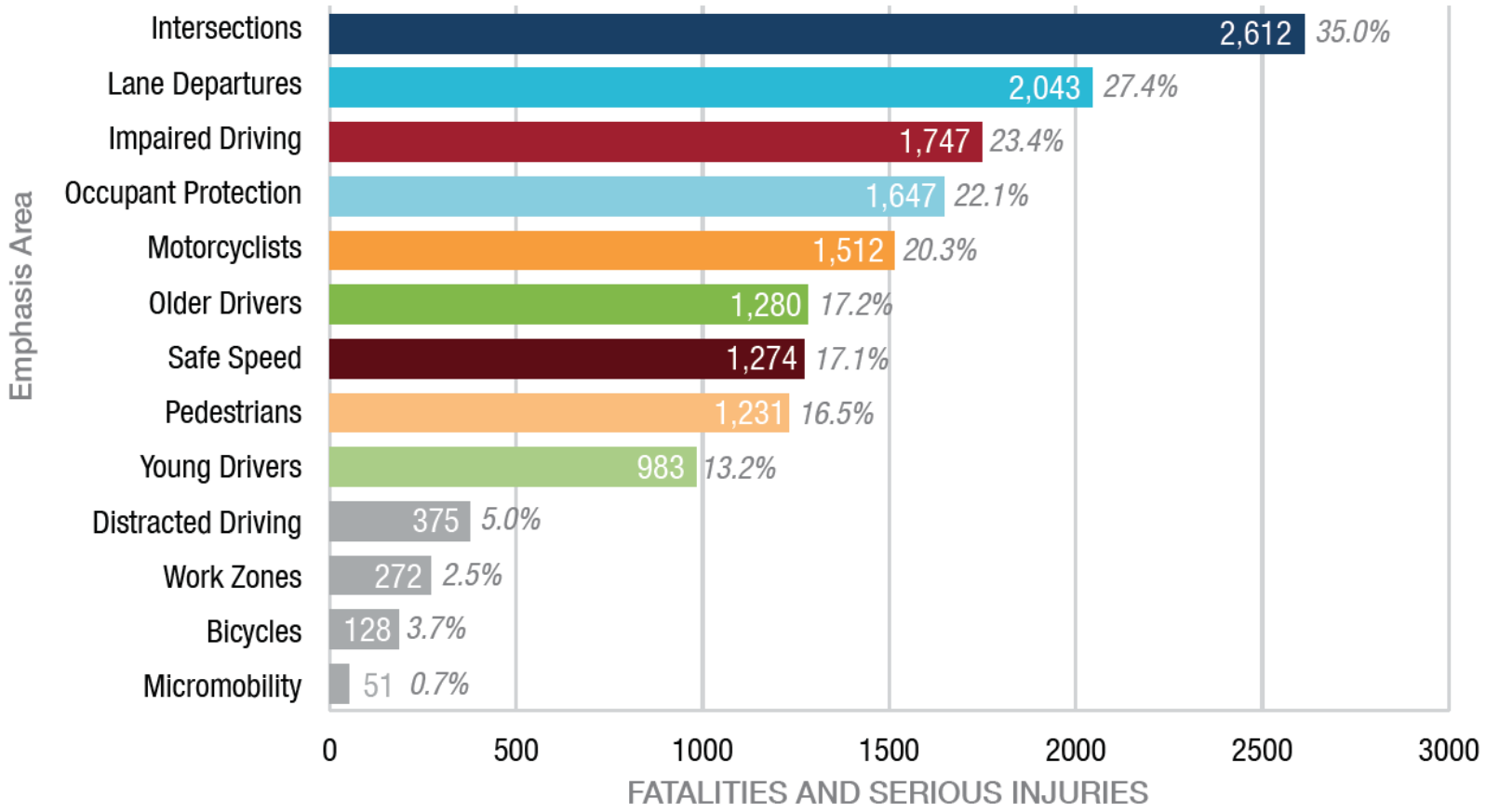
Safer Roads

Vulnerable Road Users

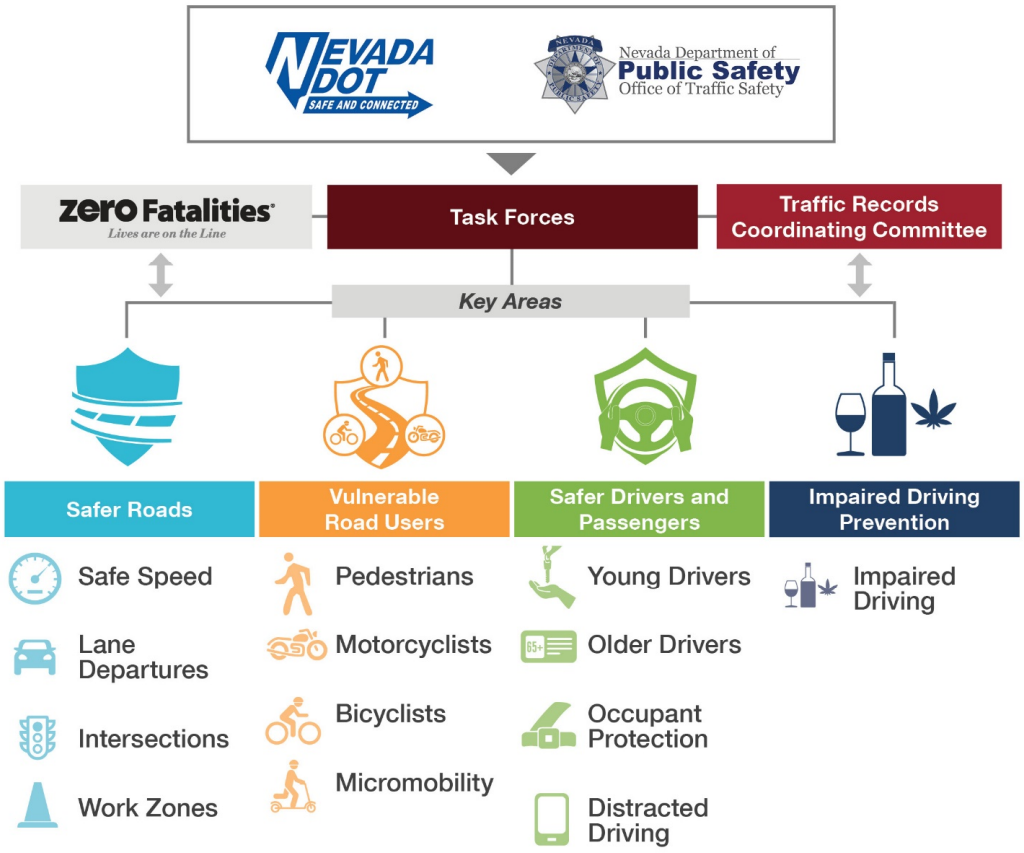
Safer Drivers and Passengers

Impaired Driving Prevention

SHSP Structure – Emphasis Areas



SHSP Structure – Key Areas and Emphasis Areas



How to Get Involved

- Attend Key Area Task Force Meetings
- Volunteer to lead an Action Step
- Visit Zero Fatalities website
  - Use the Crash Data Dashboard
  - View and share all the videos on the YouTube channel
  - Follow zerofatalitiesnv on Facebook, Twitter and Instagram

10 YEAR ANNIVERSARY
zero Fatalities®
Lives are on the Line

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Speed Management Action Plan

“Speed is at the heart of a forgiving road transportation system. It transcends all aspects of safety: without speed there can be no movement, but with speed comes kinetic energy and with kinetic energy and human error come crashes, injuries, and even deaths.”

Organization for Economic Co-operation and Development

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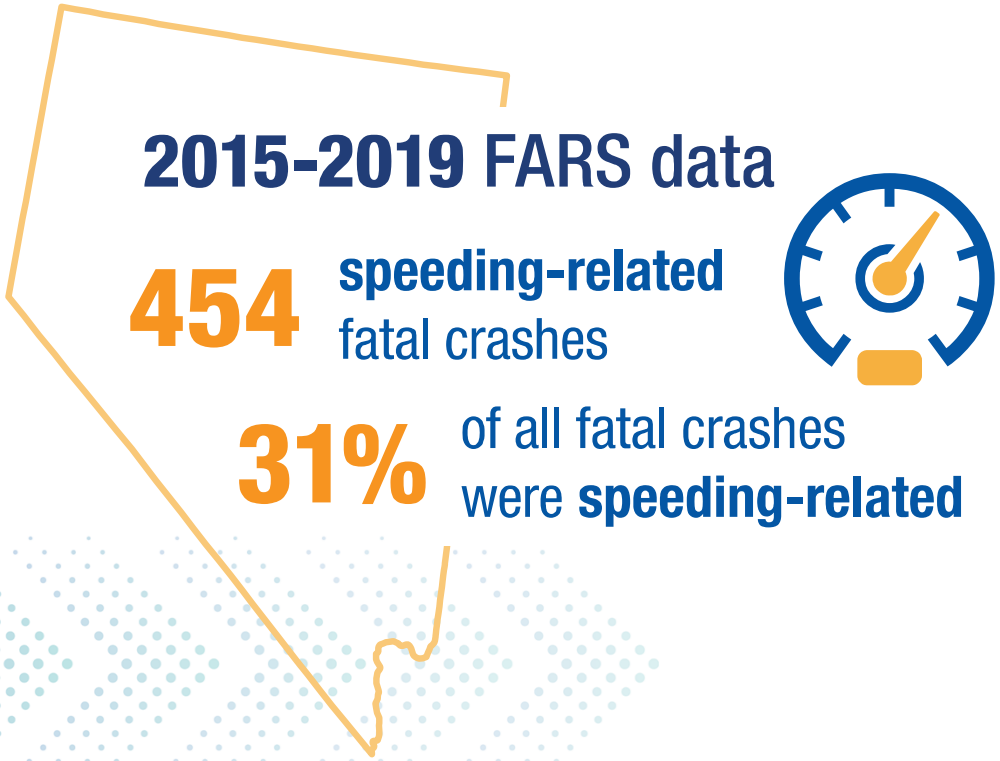
What is a Speed Management Action Plan (SMAP)?

- Characterizes speeding-related safety problems
- Identifies countermeasures and strategies (including 6Es)
- Outlines strategies and actions to reduce speeding and speeding-related fatalities and serious injuries
- Facilitates coordination and cooperation among safety stakeholders
- FHWA has documented guidance for SMAPs

- "Mini SHSP" to address speeding

Speeding-Related Fatal Crashes



Estimated Cost of Speeding-Related Crashes to Society

From **2015-2019,** speeding-related crashes resulted in a **$4.4 Billion** economic impact

equating to nearly **$900 Million** per year

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Speed and Impact on Crashes

- Speed influences the risk of a crash
- Speed influences the severity of a crash
- Controlling speed can prevent crashes
- Controlling speed can lessen severity of crashes
- At 50 mph: death is 20 times more likely than at 20 mph (source: WHO)

Speed and Impact on Pedestrians

Vehicle Speed comparison to chance of Pedestrian Injury and Fatality, Data source: US Department of Transportation, Literature Reviewed on Vehicle Travel Speeds and Pedestrian Injuries. March 2000.

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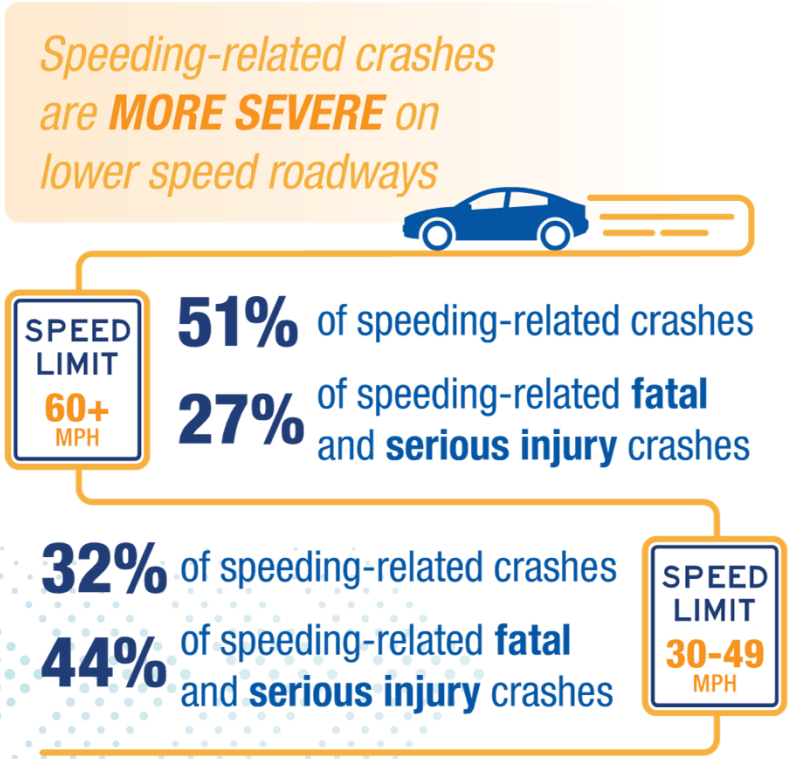
Speeding-Related Crashes are More Severe on Lower Speed Roadways



Speeding-Related Crashes are More Severe on Functional Class 3 and 4 Roadways

Speeding-related crashes are ***MORE SEVERE*** *on Principal Arterial: Other and Minor Arterial roadways*

32% of all crashes

47% of **fatal** and **serious injury** crashes

Speeding-Related Crashes are Intersection-Related

Speeding-related crashes are
INTERSECTION-RELATED

62% Principal Arterial: Other

71% Minor Arterial

Speeding-Related Fatal Crashes by Select Emphasis Area

51% of all **BICYCLE AND PEDESTRIAN** fatal and serious injury crashes are speeding-related

29% of all **MOTORCYCLE** fatal and serious injury crashes are speeding-related

25% of all **UNRESTRAINED** fatal and serious injury crashes are speeding-related

11% of all **IMPAIRED** fatal and serious injury crashes are speeding-related

Source: 2015-2019 NCATS

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Speeding-Related Crashes are Over-Represented in Rural Counties

*Speeding-related fatal and serious injury crashes are over-represented in **RURAL COUNTIES***

6% of Nevada's population lives in **Rural Counties**

15% of all speeding-related crashes

28% of **fatal and serious injury** speeding-related crashes

Source: 2015-2019 NCATS

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Kinetic Energy and the Impact on Crashes

$$KE = \frac{1}{2}mv^2$$

KE – Kinetic Energy
m – mass
v - velocity

Using this equation, we find that an increase in speed from 40 to 50 mph increases the Kinetic Energy around 150%.

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Summary of Strategies and Actions

- Communications and Educations
- Setting Speed Limits
- Plan/Design for Speed Management
- Systemic Actions and Strategies in High Crash Corridors
- Education and Publicity on High Crash Corridors
- Systemic Speed review within the Highway Safety Improvement Program (HSIP) and other Safety Programs
- Speed and Speeding-Related Data

Engineering Countermeasures to Set Target Speeds

Determine Roadway Environment

Roadway Environment		Description	Target Speed (mph)
RE1	Natural	Adjacent land is in a Bureau of Land Management (BLM), natural or wilderness condition, including lands unsuitable for settlement due to BLM or natural conditions.	60-70
			50-60
RE2	Rural	Sparsely settled lands; may include desert, agricultural land, grassland, woodland, and wetlands.	55-70
			50-60
RE2T	Rural Town	Small concentrations of developed areas immediately surrounded by rural and natural areas; includes rural and historic towns.	40-45
			30-35
			≤ 25
RE3R	Suburban Residential	Mostly residential uses within large blocks and a disconnected/sparse roadway network.	40-45
			30-35
			≤ 25
RE3C	Suburban Commercial/ Industrial	Mostly non-residential uses with large building footprints and large parking lots. Buildings are within large blocks.	40-45
			35
			≤ 30
RE4	Urban General	Mix of uses set within small blocks with a well-connected roadway network. May extend long distances. The roadway network usually connects to residential neighborhoods immediately along the corridor or behind the uses fronting the roadway.	40-45
			35
			30
RE5	Urban/ Small Town Center	Mix of uses set within small blocks with a well-connected roadway network. Typically concentrated around a few blocks and identified as part of the community, town, or city of a civic or economic center.	35
			30
			25
RE6	Urban Core	Areas with the highest densities and with building heights typically greater than four floors within urbanized areas (population >250,000). Buildings have mixed uses, are built up to the roadway, and are within a well-connected roadway network.	30-35
			25
RE7	Entertainment District	Areas with casinos and other tourist-related land uses such as hotels, gaming establishments, and large crowd generators such as arenas, theatres, and other tourist-related attractions.	30-35
			25

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Speed Management Countermeasures Along Roadways

- Speed safety cameras (speed safety cameras are currently not legal in Nevada)
- Lane narrowing
- Technology-driven solutions – could include speed feedback signs, speed monitoring cameras, Strategic Traffic Monitoring Sites (STMS), etc.
- In-pavement speed limit markings
- Transverse lane markings
- Gateway treatment
- Addition of median or two-way left-turn lane (TWLTL)
- Horizontal deflection
- Medians and pedestrian refuge islands
- Roadway reconfiguration (four- to three-lane conversion)
- Landscaping
- Terminated vista
- On-street parking
- Vertical deflection

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Speed Management Countermeasures At Intersections

- Increase Visibility
- Roundabout
- Small modern roundabouts and mini roundabouts (not traffic circles)
- Bulb-outs/neck downs
- Textured surfaces
- Diagonal diverter
- Raised intersection/vertical deflection
- Neighborhood traffic circle (not roundabouts)
- Transverse rumble strips

Selecting Countermeasures to Achieve Target Speed

- Practitioners should consider a variety of factors when selecting countermeasures including the following:
  - The roadway environment
  - Desired operating speed
  - Existing operating speed
  - Existing and future community needs
  - Existing and future multimodal needs
  - Safety of roadway users
  - Emergency response vehicles

Countermeasures to Achieve Target Speed Along Roadways

Roadway Environment		Description	Target Speed (mph)	Speed Safety Cameras	Lane Narrowing	Technology-Driven Solutions	In-Pavement Speed Limit Markings	Transverse Lane Markings	Gateway Treatment	Addition of Median or TWLTL	Horizontal Deflection	Medians and Pedestrian Refuge Islands	Roadway Reconfiguration	Landscaping	Terminated Vista	On-street Parking	Vertical Deflection
RE1	Natural	Adjacent land is in a BLM, natural or wilderness condition, including lands unsuitable for settlement due to BLM or natural conditions.	60-70	x		x											
			50-60	x	x	x											
RE2	Rural	Sparsely settled lands; may include desert, agricultural land, grassland, woodland, and wetlands.	60-70	x		x											
			50-60	x	x	x											
RE2T	Rural Town	Small concentrations of developed areas immediately surrounded by rural and natural areas; includes rural and historic towns.	40-45	x	x	x	x	x	x	x	x						
			30-35		x	x	x	x	x	x	x	x	x	x	x	x	
			≤ 25		x	x	x	x	x	x	x	x	x	x	x	x	x
RE3R	Suburban Residential	Mostly residential uses within large blocks and a disconnected/sparse roadway network.	40-45		x	x				x	x						
			30-35		x	x				x	x	x	x	x	x		
			≤ 25		x	x				x	x	x	x	x	x	x	x
RE3C	Suburban Commercial/ Industrial	Mostly non-residential uses with large building footprints and large parking lots. Buildings are within large blocks.	40-45	x	x	x				x	x						
			35		x	x				x	x	x	x	x	x		
			≤ 30		x	x				x	x	x	x	x	x	x	x
RE4	Urban General	Mix of uses set within small blocks with a well-connected roadway network. May extend long distances. The roadway network usually connects to residential neighborhoods immediately along the corridor or behind the uses fronting the roadway.	40-45	x	x	x				x	x	x					
			35		x	x				x	x	x	x	x	x	x	
			30		x	x				x	x	x	x	x	x	x	x
RE5	Urban/ Small Town Center	Mix of uses set within small blocks with a well-connected roadway network. Typically concentrated around a few blocks and identified as part of the community, town, or city of a civic or economic center.	35		x	x				x		x	x	x		x	
			30		x	x				x	x	x	x	x	x	x	
			25		x	x				x	x	x	x	x	x	x	x
RE6	Urban Core	Areas with the highest densities and with building heights typically greater than four floors within urbanized areas (population >250,000). Buildings have mixed uses, are built up to the roadway, and are within a well-connected roadway network.	30-35		x	x				x	x	x	x	x	x	x	
			25		x	x				x	x	x	x	x	x	x	x
RE7	Entertainment District	Areas with casinos and other tourist-related land uses such as hotels, gaming establishments, and large crowd generators such as arenas, theatres, and other tourist-related attractions.	30-35		x	x				x		x	x	x	x		x
			25		x	x				x		x	x	x	x		x

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Countermeasures to Achieve Target Speed at Intersections

Roadway Environment		Description	Target Speed (mph)	Increase Visibility	Roundabout	Small Modern Roundabouts and Mini-Roundabouts	Bulb- Outs/ Neck Down	Textured Surfaces	Diagonal Diverter	Raised Intersection / Vertical Deflection	Neighborhood Traffic Circles	Transverse Rumble Strips
RE1	Natural	Adjacent land is in a BLM, natural or wilderness condition, including lands unsuitable for settlement due to BLM or natural conditions.	60-70	x								x
			50-60	x								x
RE2	Rural	Sparsely settled lands; may include desert, agricultural land, grassland, woodland, and wetlands.	60-70	x								x
			50-60	x								x
RE2T	Rural Town	Small concentrations of developed areas immediately surrounded by rural and natural areas; includes rural and historic towns.	40-45	x	x							x
			30-35	x	x	x	x	x				
			≤ 25	x	x	x	x	x	x	x	x	
RE3R	Suburban Residential	Mostly residential uses within large blocks and a disconnected/sparse roadway network.	40-45	x	x							
			30-35	x	x	x	x	x				
			≤ 25	x	x	x	x	x	x	x		
RE3C	Suburban Commercial/ Industrial	Mostly non-residential uses with large building footprints and large parking lots. Buildings are within large blocks.	40-45	x	x							
			35	x	x	x	x	x				
			≤ 30	x	x	x	x	x	x	x		
RE4	Urban General	Mix of uses set within small blocks with a well-connected roadway network. May extend long distances. The roadway network usually connects to residential neighborhoods immediately along the corridor or behind the uses fronting the roadway.	40-45	x	x							
			35	x	x	x	x	x				
			30	x	x	x	x	x	x	x	x	
RE5	Urban/Small Town Center	Mix of uses set within small blocks with a well-connected roadway network. Typically concentrated around a few blocks and identified as part of the community, town, or city of a civic or economic center.	35	x	x		x					
			30	x	x	x	x	x	x			
			25	x	x	x	x	x	x	x	x	
RE6	Urban Core	Areas with the highest densities and with building heights typically greater than four floors within urbanized areas (population >250,000). Buildings have mixed uses, are built up to the roadway, and are within a well-connected roadway network.	30-35	x	x	x	x	x	x			
			25	x	x	x	x	x	x	x		
RE7	Entertainment District	Areas with casinos and other tourist-related land uses such as hotels, gaming establishments, and large crowd generators such as arenas, theatres, and other tourist-related attractions.	30-35	x	x	x	x	x		x		
			25	x	x	x	x	x		x		

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“People generally do not speed because they are deviants. They speed because driving is a passive activity, one that almost never required the driver actively to concentrate or be mentally engaged to perform.”

Charles L. Mahron, Jr.

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What Else Can We Do?

- Be thoughtful of the Safe Systems Approach when working on land development projects by including:
  - Adequate counts for all users, not just vehicles
  - Ensuring that any access points to existing roadway facilities fit the context and environment
- Consider variances for parking minimums when developing potentially impairing facilities i.e. cannabis consumption lounges
- Ensure that there are adequate facilities for people to move without a car at potentially impairing facilities

Questions?


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Nevada Advisory Committee on Traffic Safety

- The Nevada Advisory Committee on Traffic Safety (NVACTS) meets quarterly to provide guidance, approval and consensus on Highway Safety in Nevada
- Member agencies include:
  - Nevada Department of Transportation, Nevada Department of Public Safety, Nevada Department of Education, Nevada Department of Health and Human Services, Nevada Department of Motor Vehicles, Nevada Association of Counties, Nevada Leagues of Cities, Nevada Sheriffs' and Chiefs' Association, Nevada State Assembly Committee on Growth and Infrastructure, Nevada State Senate Committee on Growth and Infrastructure, Administrative Office of the Courts, Inter-Tribal Council of Nevada, Carson Area Metropolitan Planning Organization, Regional Transportation Commission of Southern Nevada, Regional Transportation Commission of Washoe County, Tahoe Regional Planning Agency, University of Nevada, Las Vegas Transportation Research Center and University of Nevada, Las Vegas School of Medicine