Zero Starts Here: A Multidisciplinary Roundtable on Applying the Safe System

Brought to you by the MCDITE Safety Committee

Safety Committee

- Emily Hufnal, emily.hufnal@delaware.gov
- Shraddha Praharaj, spraharaj@cityoffrederickmd.gov
- Marvin Ta, mta@pennoni.com

Interested in joining the committee?

- Scan the QR code;
- Email a Co-Chair; or
- Talk to us after!

Presenters

Ginny O'Connor
Safer People / Safer Speeds

Team Lead, Roadway Safety Policy
toXcel

Sushant Jagtap
Safer Vehicles

Research Engineer
IIHS

Jeff Riegner
Safer Roads / Safer Land Use

Senior Principal
Kittelson & Associates

Eric Tang
Post Crash Care

Senior Highway Safety Engineer
VHB

- Death and Serious Injuries are Unacceptable
- Humans Make Mistakes
- Humans are Vulnerable
- Responsibility is Shared
- Safety if Proactive
- Redundancy is Crucial


Safer People
Safer Vehicles
SAFE SYSTEM APPROACH
Post-Crash Care
Safer Speeds
Safer Roads

Safer People

Who are the road users we're designing for?

Every person who uses the road, not just drivers

Walk

Bike

Drive

Transit

Other

Source for all images: FHWA SSA Presentation and Fehr & Peers

Risky Driving Behaviors

- Drunk Driving – 11,904 deaths[1]
- Drug-Impaired Driving – 56% of KSI Drivers[2]
- Distracted Driving – 3,208 deaths[3]
- Speeding – 11,288 deaths[4]
- Drowsy Driving – 684 deaths[5]

Some Key Risky Behaviors

DISTRACTION

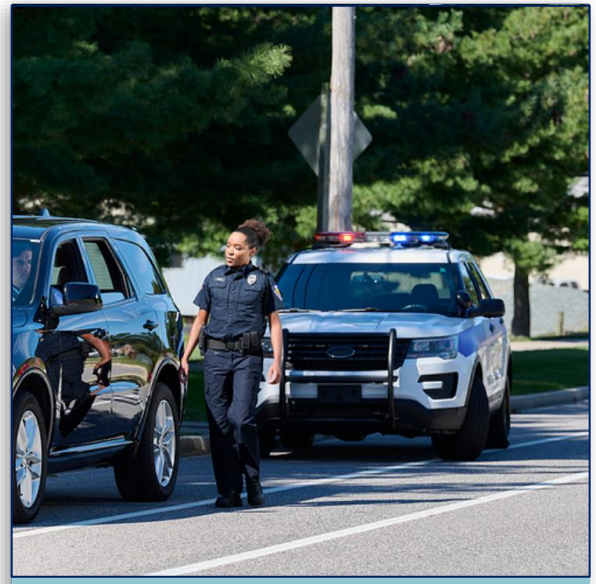
Eyes off the road

IMPAIRMENT

Judgment impaired

SEAT BELT USE

Unprotected impact



SPEEDING

Less time to react

Images Source: NHTSA

Countermeasures and Applicable Behaviors

Priority Unsafe Driving Behaviors

SEAT BELT USE

DISTRACTION

IMPAIRMENT

SPEEDING

Strategies

ENFORCEMENT

EDUCATION

OUTREACH

COMBINATIONS OF THE THREE

Examples of Enforcement, Engagement, & Education Strategies

High-Visibility Enforcement

Integrated Enforcement

Handheld Device and Distracted Driving Enforcement

Employer-Based Programs

Enforcement of Drug-Impaired Driving

Alcohol Misuse Identification and Intervention

Alternative Transportation

Alcohol-Impaired Motorcyclists: Detection, Enforcement, and Sanctions

Increase Motorcycle Rider Conspicuity, Use of Protective Clothing, & Proper Helmet Use

Speed Safety Camera Enforcement

Images Source: NHTSA

The Reframe

Behavioral problems are often design problems in disguise.

When enforcement doesn't stick and education campaigns don't move the needle, the road itself may be sending the wrong message.

Why Behavior Is So Hard to Change: Human Factors

- Drivers respond more to how a road feels than to signs or rules
- Wide, open roads cue higher speeds, regardless of posted speed limits
- People misjudge risk
- Design can correct behavior


Safer People
Safer Vehicles
SAFE SYSTEM APPROACH
Safer Speeds
Post-Crash Care
Safer Roads

The Speeding Problem

As vehicle speed increases...

1. Reaction time to avoid collisions decreases
2. Stopping distance increases
3. Roadside safety measures (guardrails, median dividers) become less effective
4. Steering control decreases
5. Injury severity increases

72% of speed-related fatal crashes in 2022 involved vehicle occupants, showing even modern vehicle safety advances have limits.

Source: NHTSA, 2022

Safe speeds reduce impact forces, improve visibility, and allow more reaction time — preventing crashes, not just reducing severity.

Speed Limits Aren't Enough

What shapes driver speeds:

DESIGN	Lane width, shoulder & sight distance all communicate what speed to go
CONTEXT	Open rural land 'feels' fast; dense settings feel slower
PERSON	Fatigue, distraction & time pressure — often unintentional speeding

Self-Explaining Roads

Road design naturally guides driver speed

Aligns road appearance with expected speeds

Uses visual cues: narrow lanes, raised crosswalks

Prevents misleading features like wide, flat roads

Beyond the 85th Percentile

For decades, limits were set where 85% of drivers naturally traveled — reflecting behavior, not safety. The updated MUTCD no longer requires this. The new question is:

> ***"How fast should people be driving here, given who uses this road?"***

Changing the sign alone won't change behavior. Limit changes must be paired with engineering modifications and clear public communication.

Free Decision-Support Tools

USLIMITS2

FHWA • Free • Web-based

Considers operating speeds, AADT, roadway geometry, land use, crash rates, parking & pedestrian activity.
Help: help@uslimits.org

Posted Speed Limit Setting (SLS) Tool

NCHRP

Evaluates roadway features and crash risk across four facility types: limited-access, undeveloped, developed, and full-access.

Engineering, Enforcement & Education

ENGINEERING

Gateway treatments & rumble strips at speed transition zones

Lane narrowing & roundabouts: slow speeds physically

Speed humps, raised crosswalks & chicanes

Optical speed bars: visual cues prompting deceleration

ENFORCEMENT

Traditional patrol RADAR: visible deterrent at specific locations

Speed Safety Cameras (SSCs): automated, impartial, cites all violators.

Use enforcement as a bridge while engineering improvements are built

EDUCATION

Explain the safety rationale, not just the rule

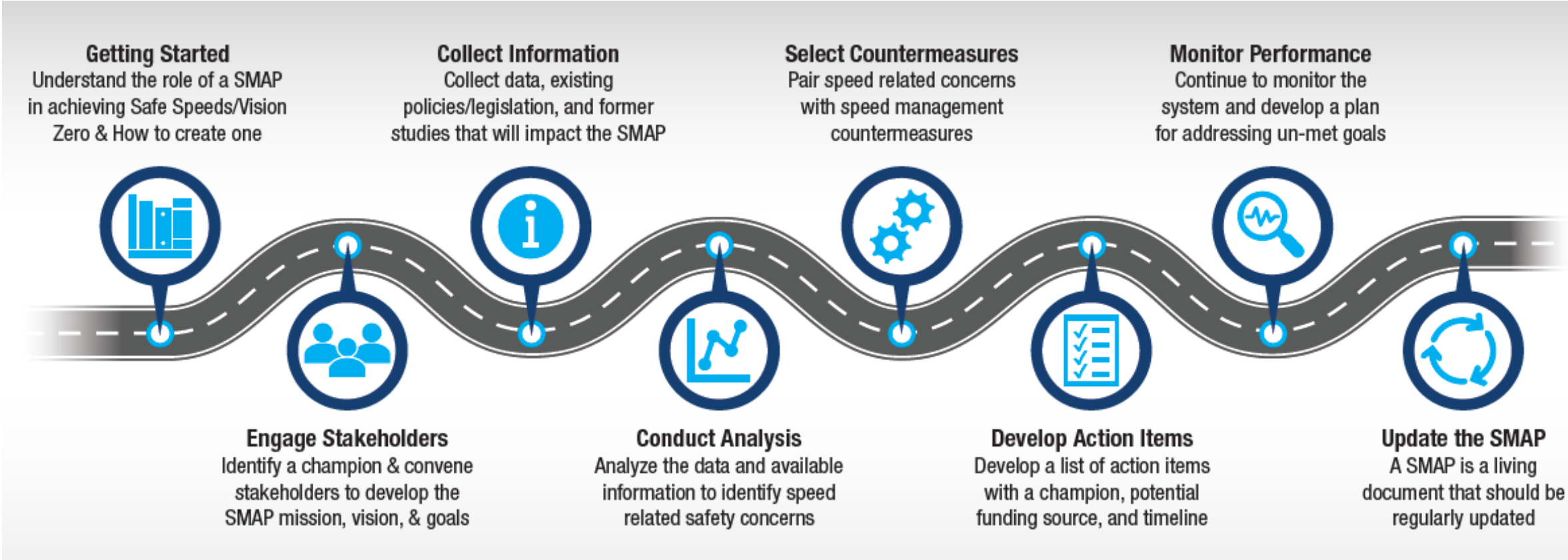
Share crash data, speed compliance & before/after outcomes publicly

Equity matters: lower-income communities face higher fatality rates

Coordinate with schools, employers, health depts & media

No single strategy is sufficient. The most durable results come from all three working together.

Speed Management Action Plans



Public Trust & Legal Authority

Speed management fails without public support

Build Public Support

- Engage residents before solutions are proposed, not after
- Share crash data transparently and publicize results
- Demonstrate commitment to fair, data-driven enforcement

Legislation & policy shape your options

Know Your Legal Landscape

- State statutes on SSC programs
- If state DOT approval is required for local limit changes
- Statutory speed limits that override local authority
- Your State Highway Safety Plan (SHSP) emphasis areas

Safe Speeds Require a System Approach

01

Speeding is a system problem

When road design and the posted limit conflict, the road wins. Fix the system, not just the sign.

02

Three elements must work together

The right limit + self-explaining design + fair enforcement. No single strategy is sufficient.

03

A SMAP is your roadmap

Data-driven, stakeholder-supported, equity-centered. Documents commitment; supports funding.

Key Resources

FHWA Speed Management

highways.dot.gov/safety/speed-management

USLIMITS2 & SLS Tool

Free speed limit decision support • help@uslimits.org

LTAP / TTAP

Free or low-cost technical assistance for local and tribal agencies in your state

NHI Course #380128

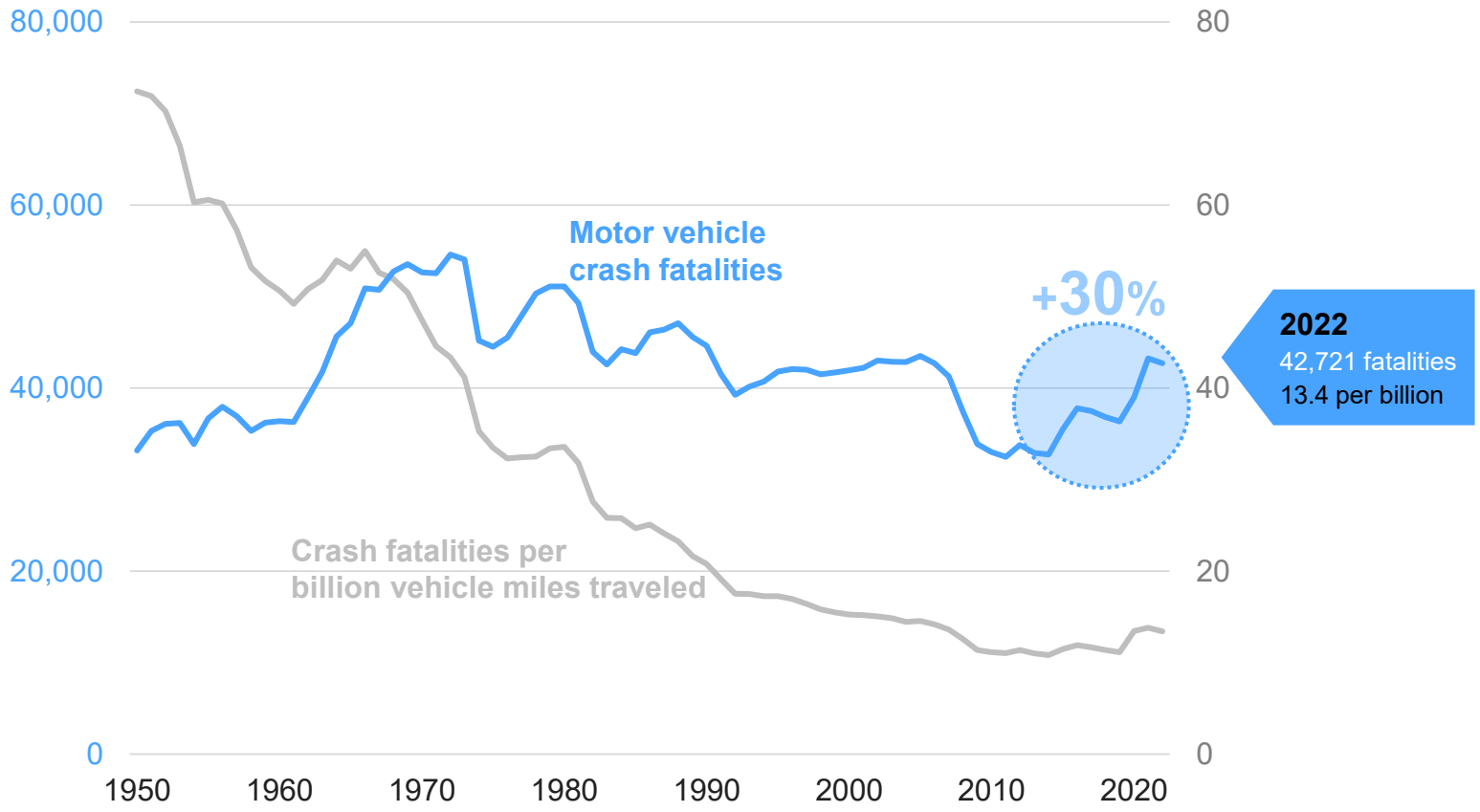
Designing and Operating Roadways for Safe Speeds


SAFE
SYSTEM
APPROACH
Safer
People
Safer
Vehicles
Safer
Speeds
Safer
Roads
Post-Crash
Care

Motor vehicle crash fatality rates have **declined significantly** in the U.S. during the past 50+ years, **but...**

U.S. motor vehicle crash fatalities

1950-2022



IIHS HLDI

30x30

Reduce roadway fatalities 30% by 2030

Changing the trajectory

⇧30%

Fatalities increased to 42,721 in 2014-2022

→

⇩30%

Initiative to **reduce fatalities by 2030**

→

↘0

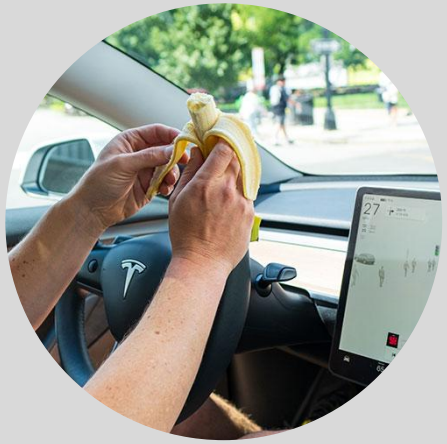
Towards **ZERO fatalities**

IIHS HLDI

30 x 30

Reduce roadway fatalities 30% by 2030

Emphasis areas



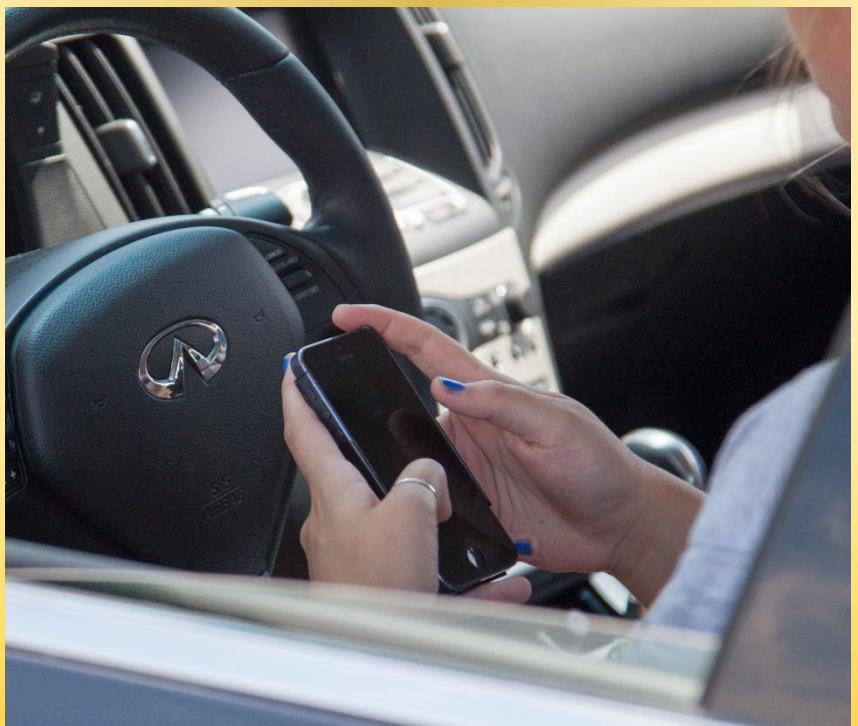
Reducing risky behavior

Extending safety to everyone

Accelerating commercial vehicle safety

IIHS HLDI

Risky behaviors



Risky behaviors

2023 fatalities

Fatalities with an **alcohol-impaired** driver

Fatalities in **speeding-related** crashes

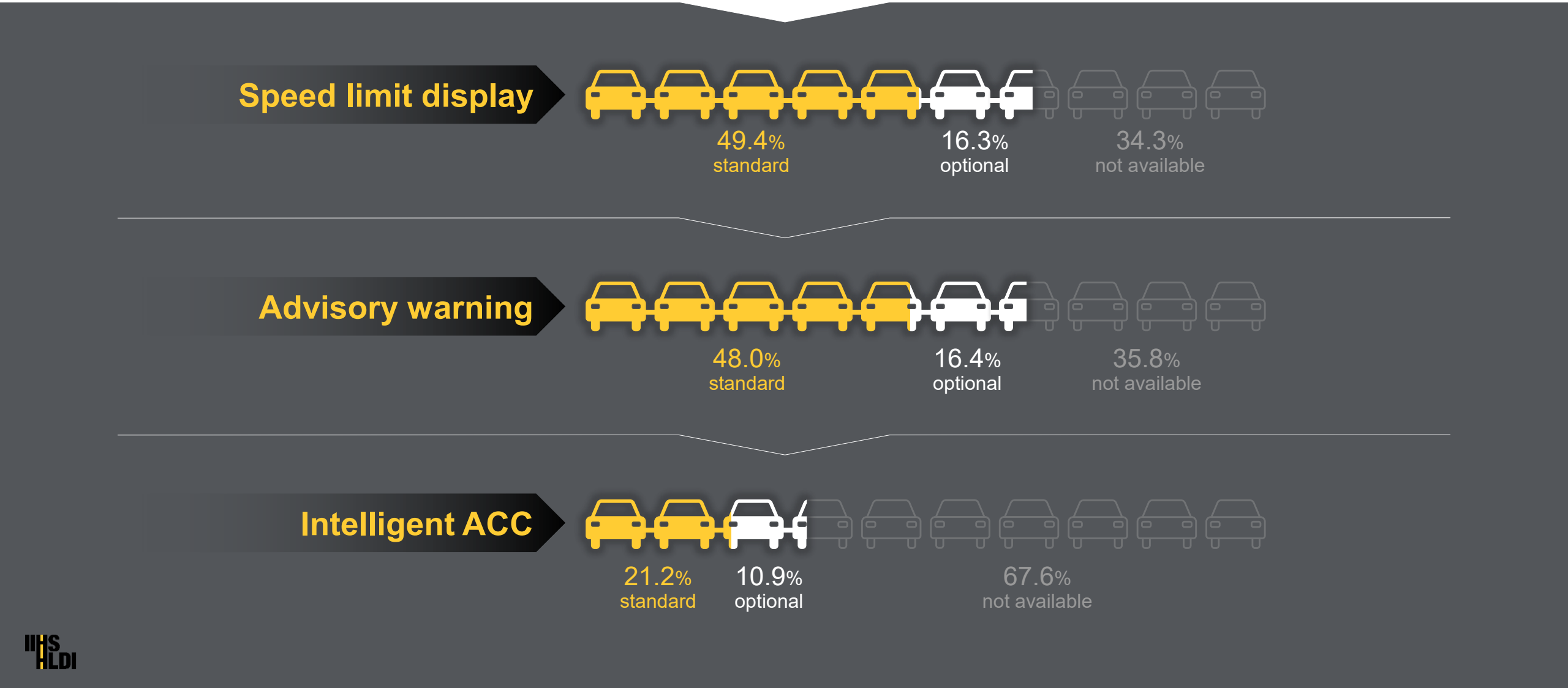
Fatalities in **distraction-related** crashes

Fatally injured passenger vehicle drivers who were **unbelted**

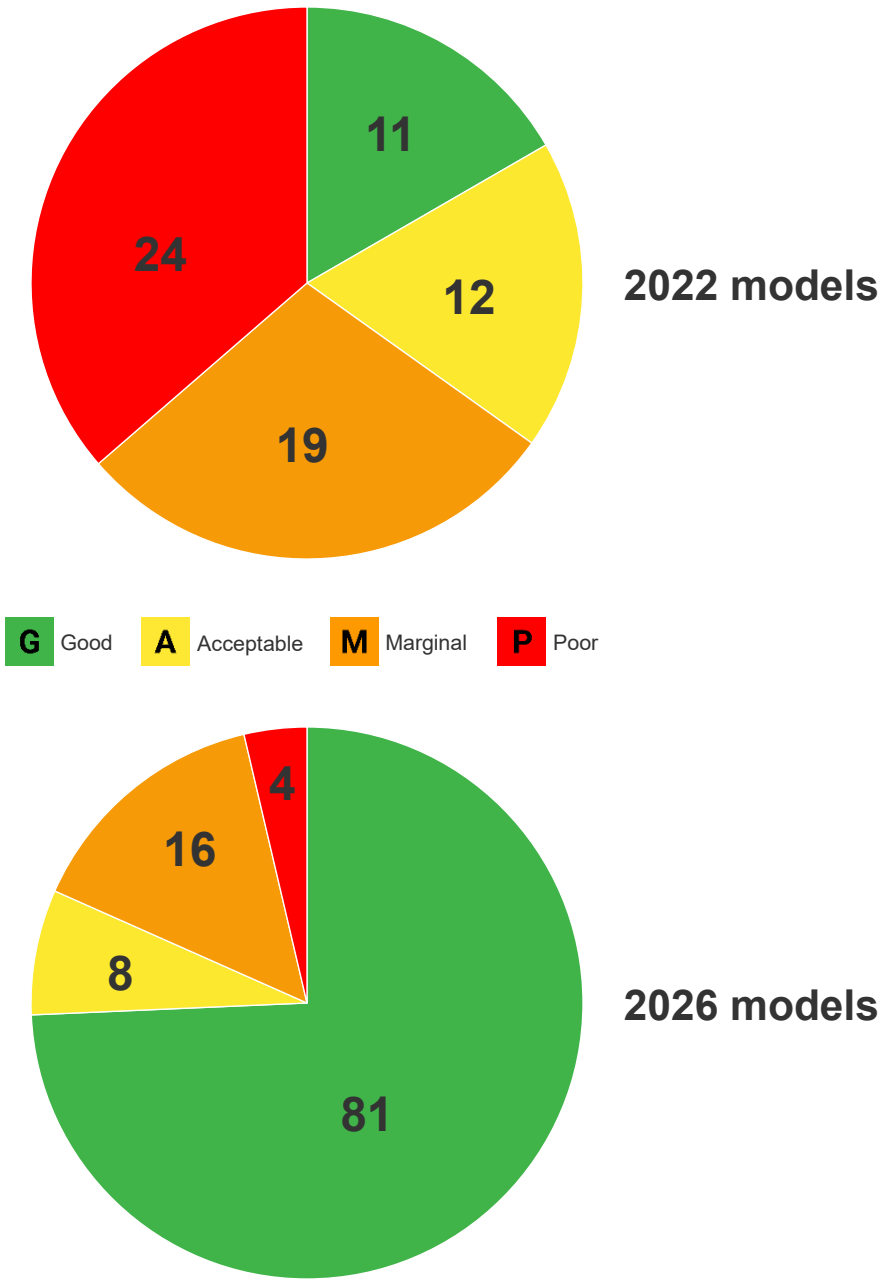

Occupant compartment intact
40 mph
IIHS Moderate Overlap
40 mph
Test No. CAL 3823
IIHS
HUMANETICS
Occupant movement controlled
40 mph

Intelligent Speed Assistance is already here

Availability on 2025 models




Belt reminders have improved rapidly since IIHS began rating them
PRESS


11
12
19
24
2022 models
G Good
A Acceptable
M Marginal
P Poor
4
16
8
81
2026 models

New paradigm for *Top Safety Pick*

Focus on interventions
aimed at the biggest safety problems

IIHS TOP SAFETY *PICK*

Expected base level safety in every vehicle

- Crashworthiness
- Crash avoidance

IIHS TOP SAFETY *PICK+*

Technologies to promote safe driving

- Intelligent speed assistance
- Distraction mitigation
- Impairment detection

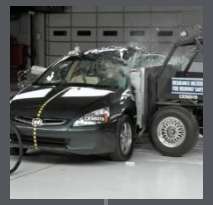
IIHS HLDI

Extending safety to everyone

IIHS testing over 30 years

1995
Moderate overlap front

2003
Side impact

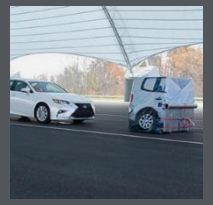


2004
Head restraints

2009
Roof strength

2012
Small overlap front: driver-side

2013
Front crash prevention



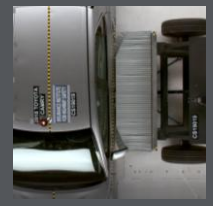
2015
LATCH ease of use

2016
Headlights

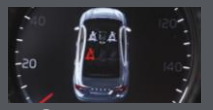
2017
Small overlap front: passenger-side

2019
Pedestrian AEB (daytime)

2021
Updated side impact



2022
Seat belt reminder systems

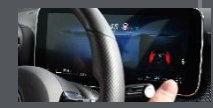


Updated moderate overlap front

Pedestrian AEB (nighttime)

2024
Updated front crash prevention

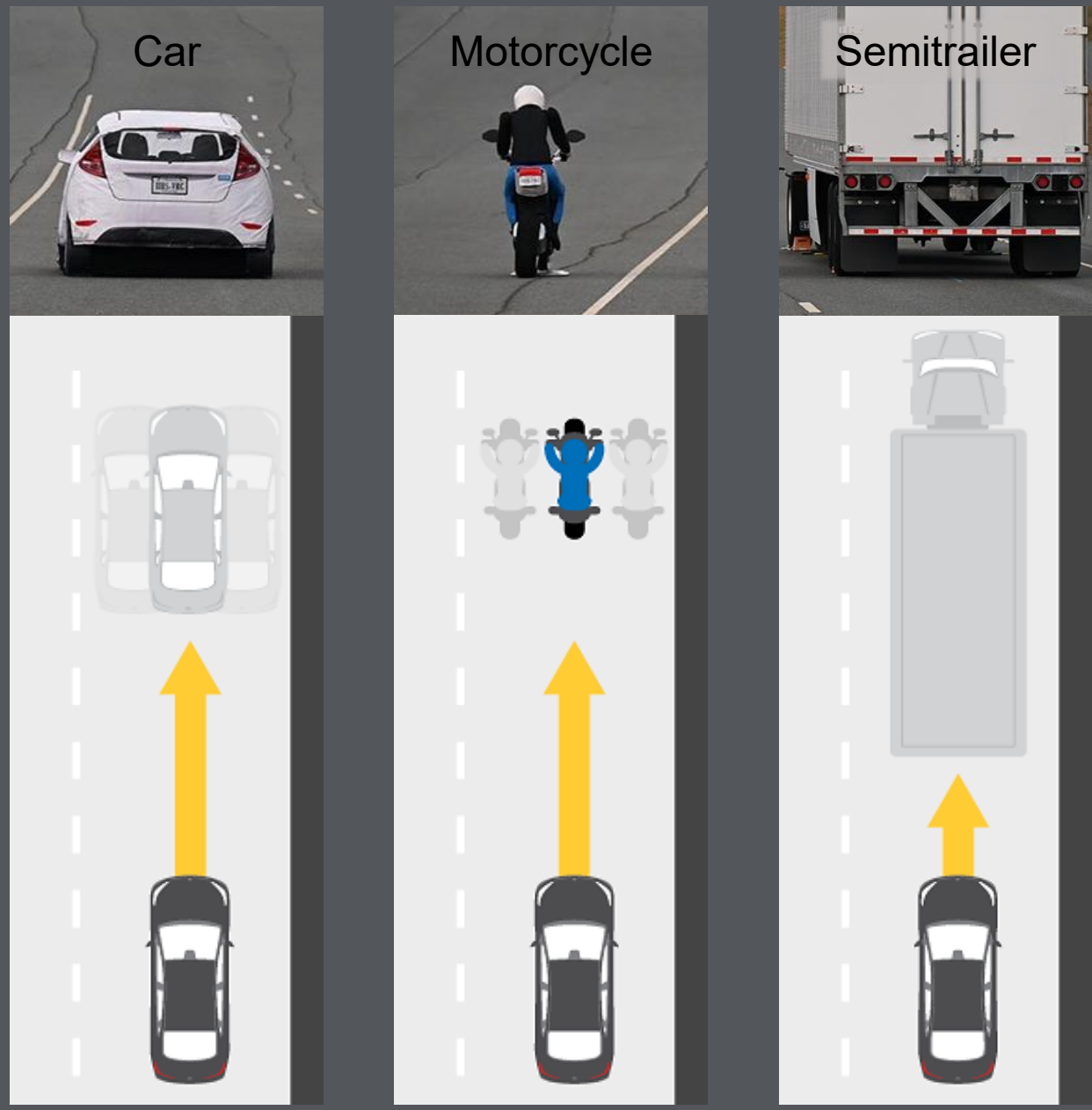
Partial automation



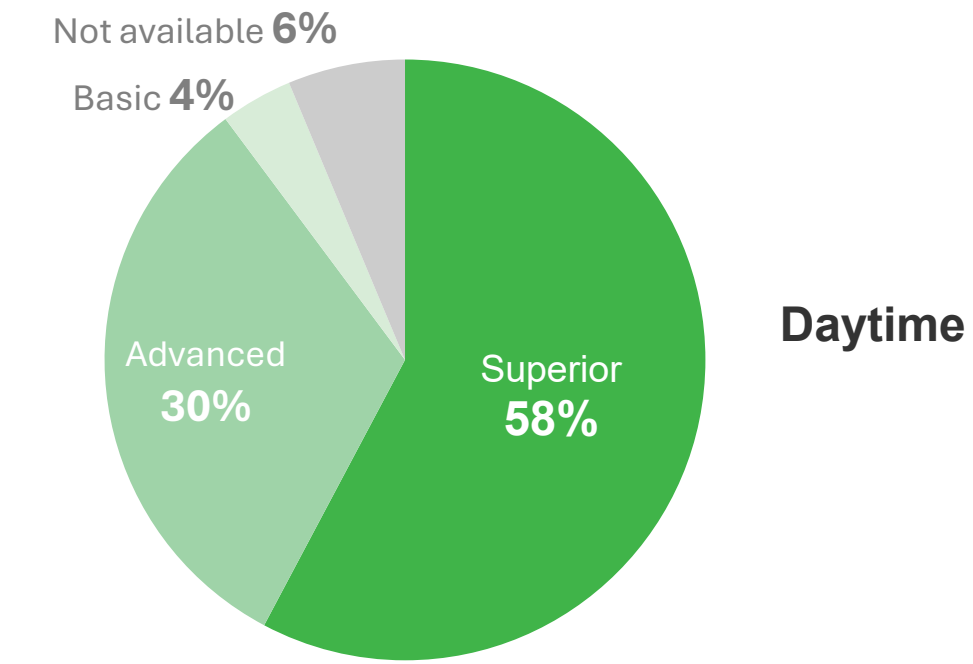
AEB can prevent more crashes

Expanded IIHS testing and evaluation

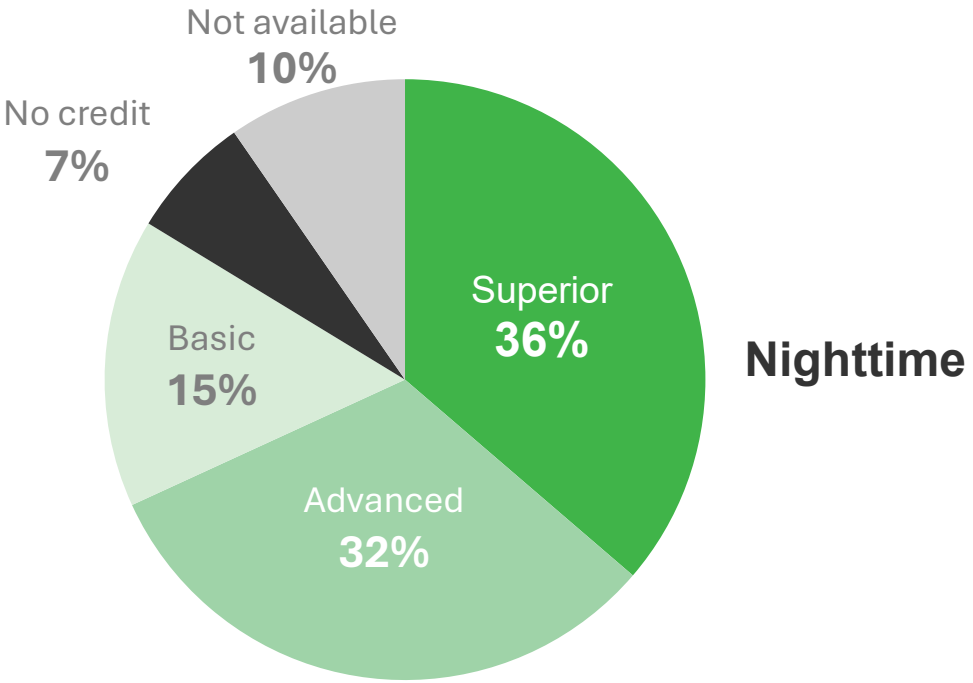
- Higher speeds – up to 43 mph
- Additional targets – motorcycle and semitrailer
- Part of *TOP SAFETY PICK* award criteria in 2026



Pedestrian AEB ratings for 2023 models

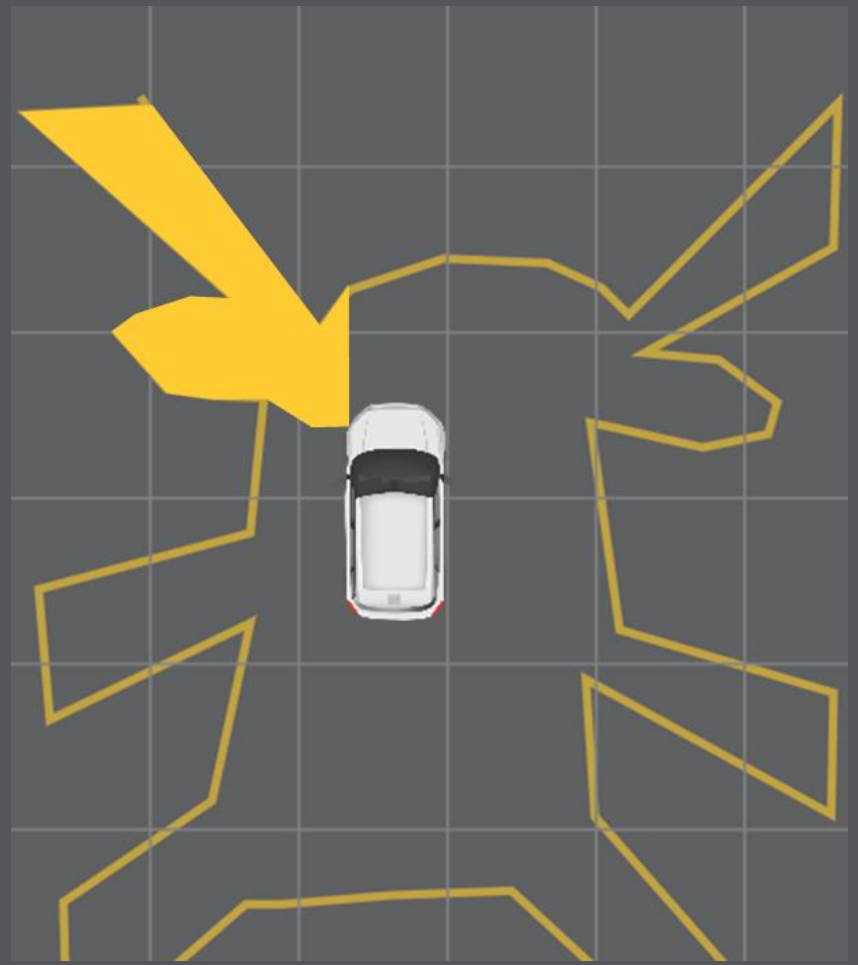


Daytime

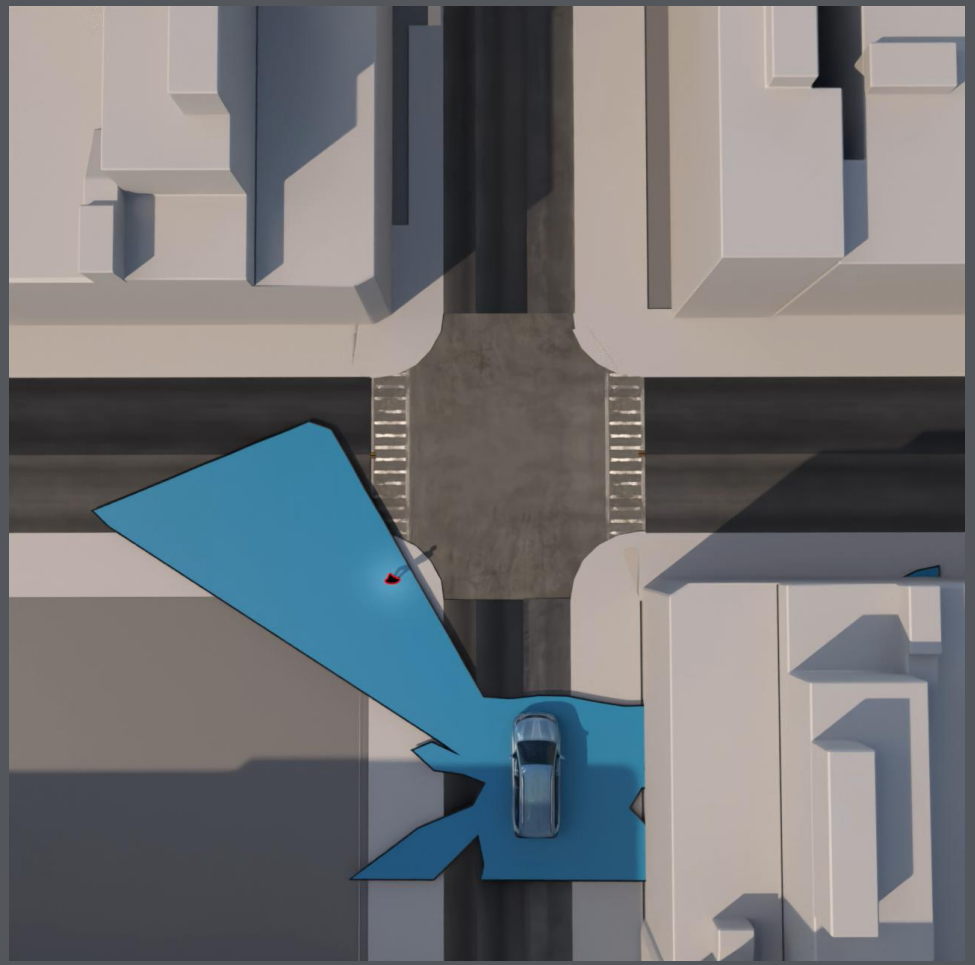


Nighttime

Left-turning blind zone research

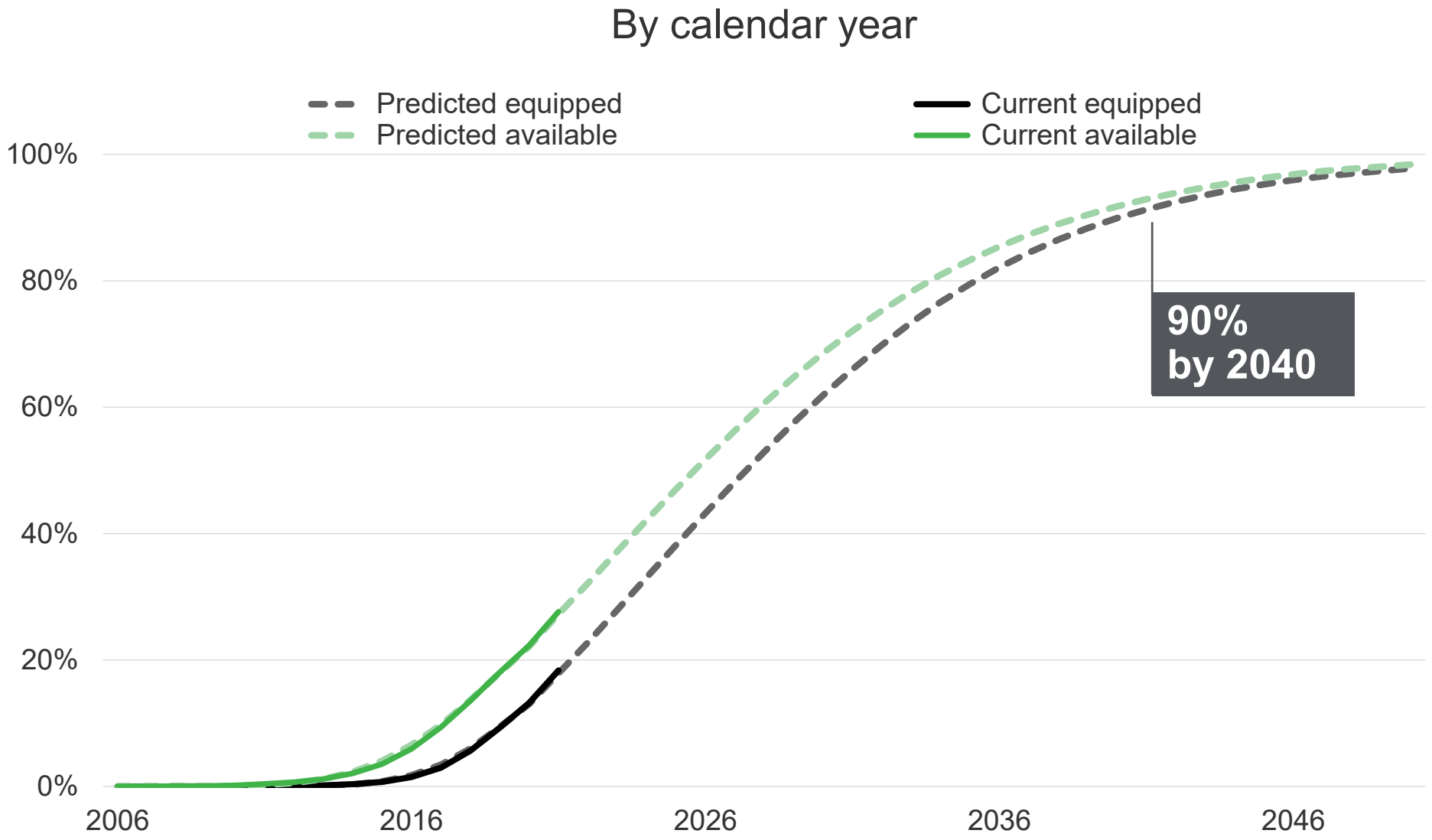


Blind zone map of a vehicle



Dynamic interaction simulation with a crossing pedestrian

Predicted percentage of registered vehicles with automatic emergency braking



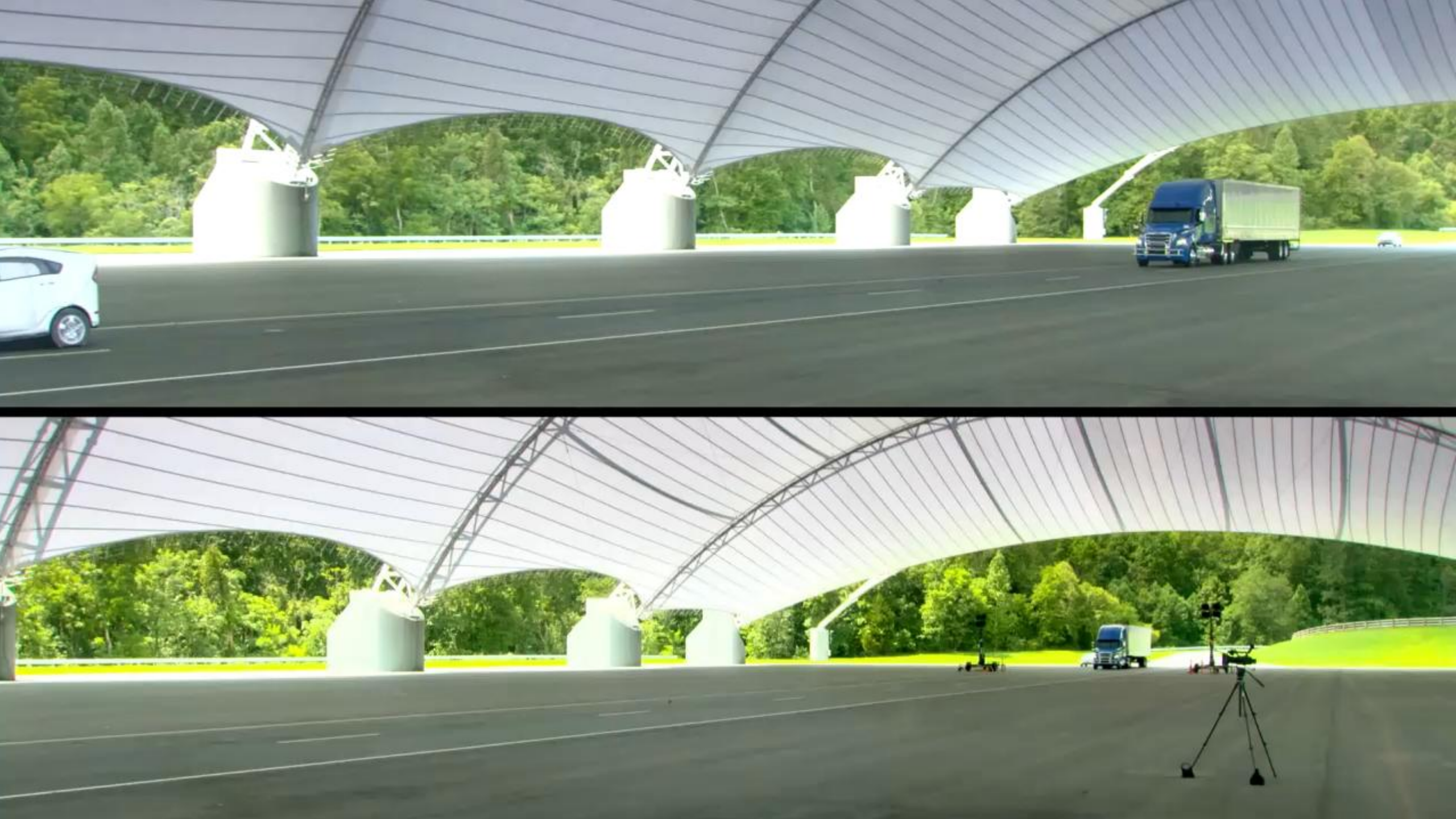
Accelerating commercial vehicle safety

16%

OF ALL FATAL CRASHES

involve cargo vans, medium- or heavy-duty vehicles

IIHS HLDI



IIHS is evaluating ADAS and other safety features in cargo vans

Results expected spring 2026

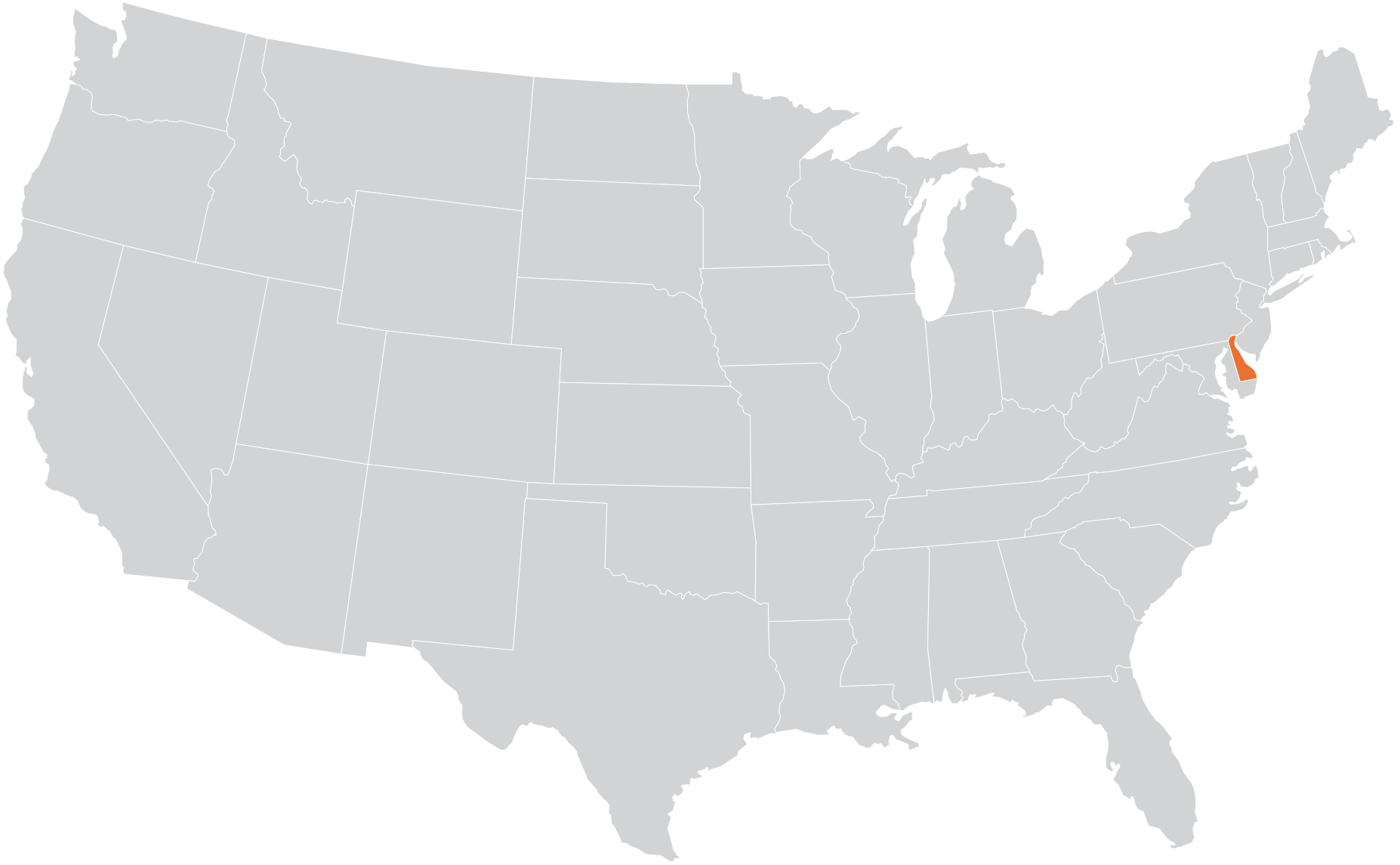

Safer People
Safer Vehicles
SAFE SYSTEM APPROACH
Post-Crash Care
Safer Speeds
Safer Roads

SAFER INFRASTRUCTURE

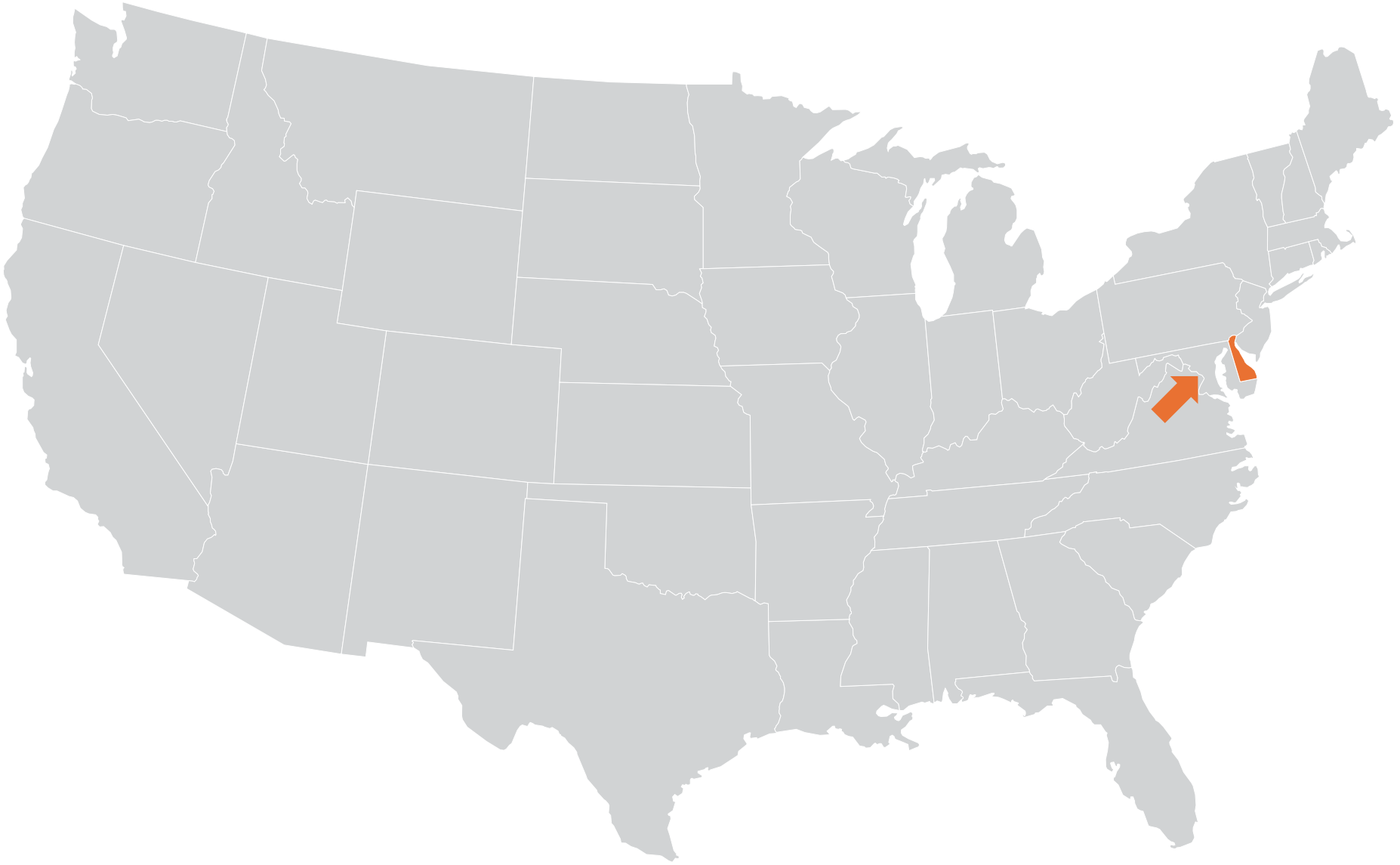
The Transportation-Land Use Connection

Jeff Riegner • Kittelson & Associates • April 17, 2026

Case studies



Case studies



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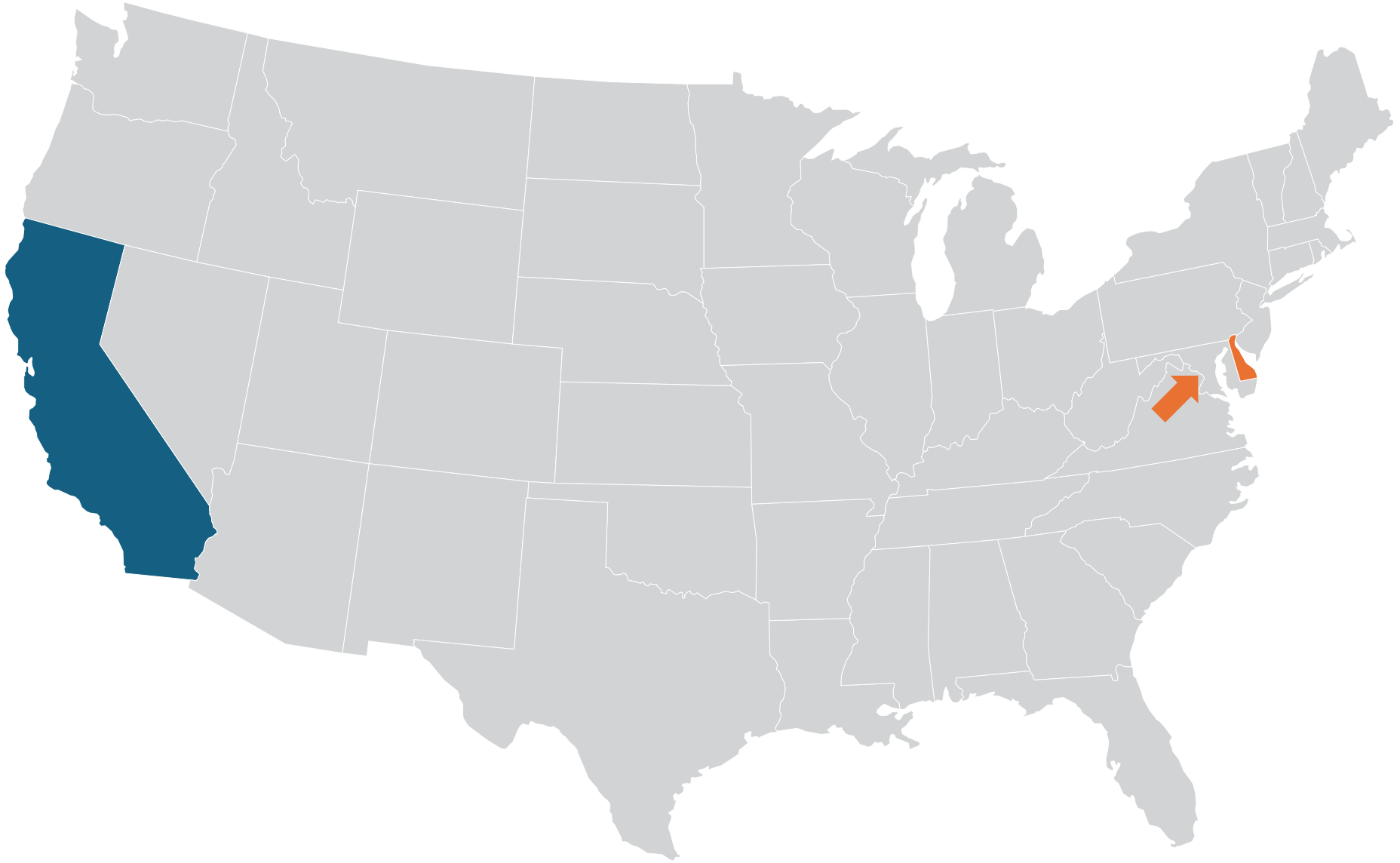

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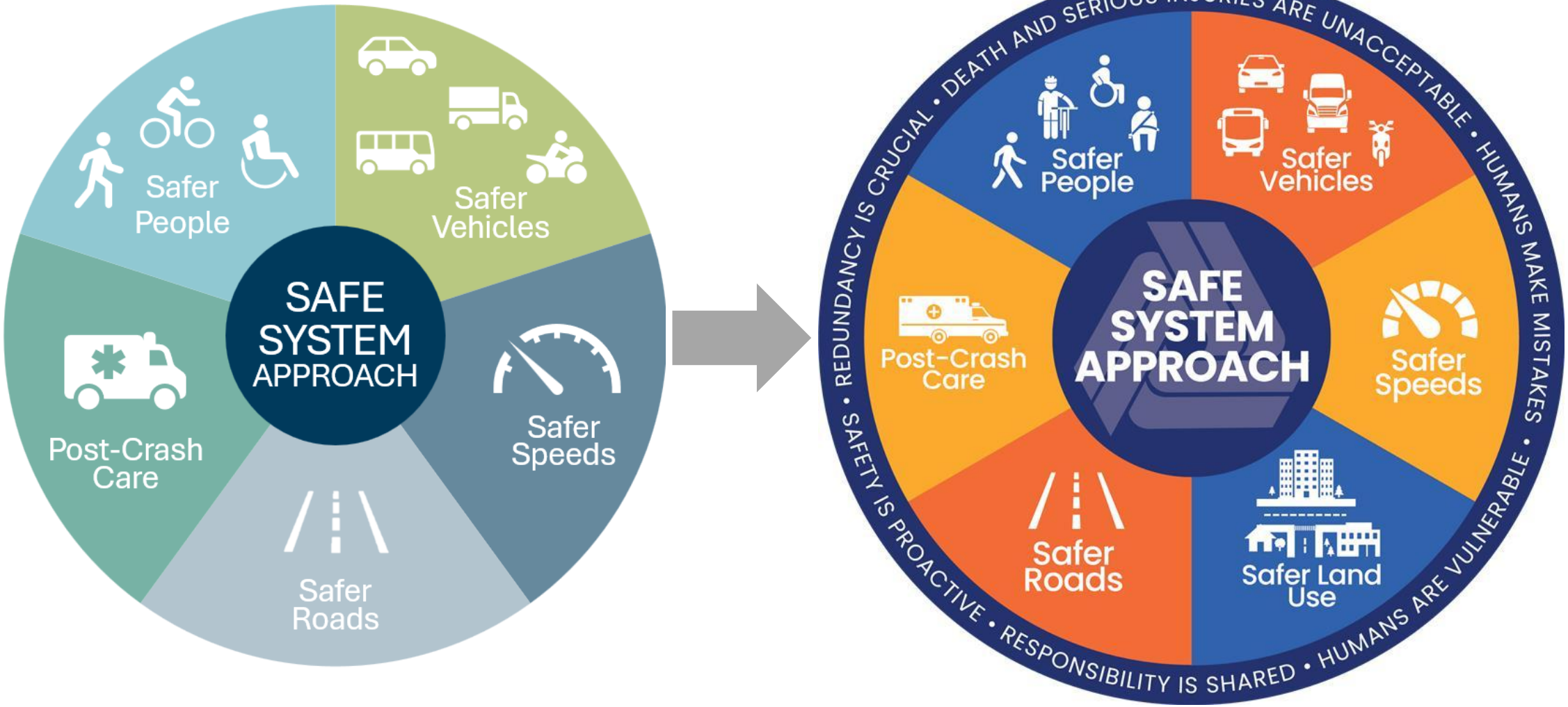


Source: Delaware Department of Transportation

Integration of Safer Land Use into SHSPs

DELAWARE

- Reduced distances between destinations
- Managing access to the transportation system
- Close consultation between transportation officials and local land use authorities
- Consideration of the Safe System Approach in comprehensive plans
- Land use design principles for active transportation

Integration of Safer Land Use into SHSPs

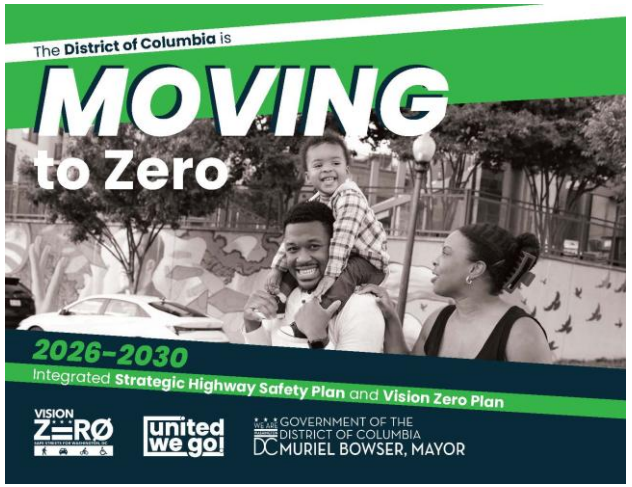
DELAWARE

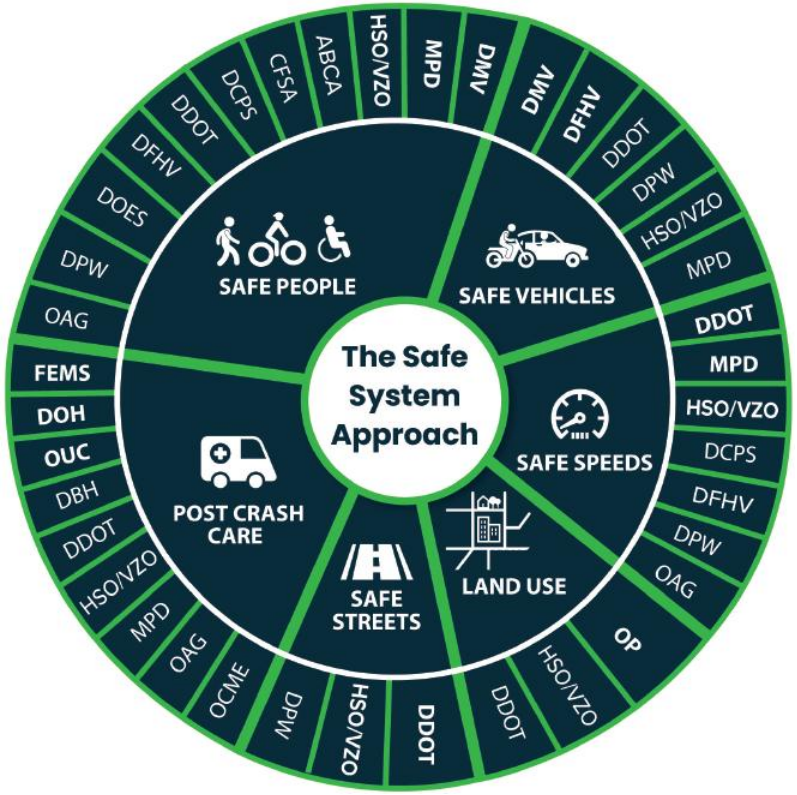
Safer Roads	Update or establish design policies and guidance to foster design principles that accommodate human error and reduce crash forces.
	Implement projects to improve the transportation system that provide safety benefits for all road users, based on the functional classification of the roadway, surrounding land use, and future development.
	Implement proven safety countermeasures that are intended to reduce fatalities and serious injuries at locations identified through a data-driven analysis.
	Prioritize high-crash locations for diagnosis and investment.
Safer Land Use	Coordinate with local land use agencies to develop policies and guidelines to improve linkages between land use and transportation to improve safety for all road users.
	Coordinate with county and local governments to incorporate the Safe System Approach into future comprehensive planning documents.

Integration of Safer Land Use into SHSPs

DISTRICT OF COLUMBIA

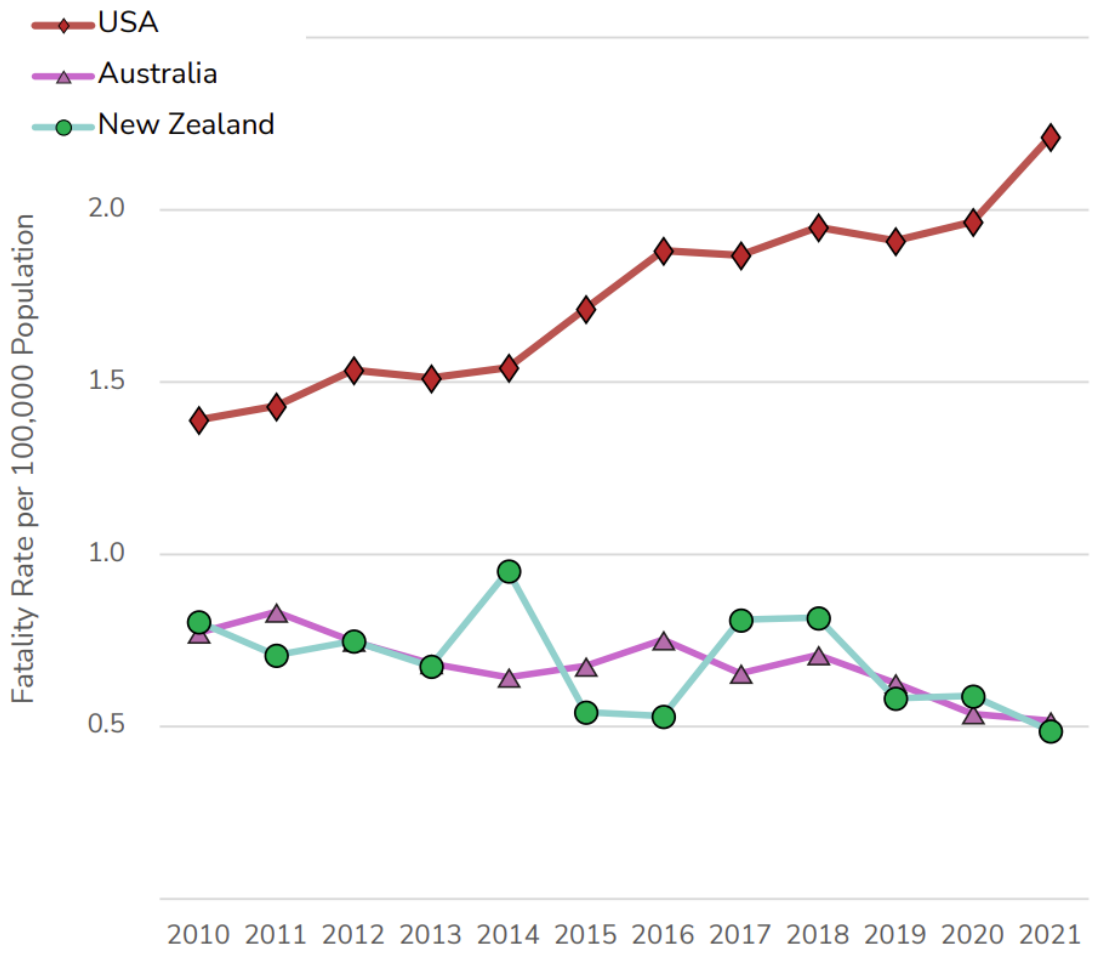
- Nation's first integrated SHSP and Vision Zero Plan
- Partnership with DC's Office of Planning
- Incorporated into the District's 25-year comprehensive plan, **DC 2050**





The Caltrans Approach

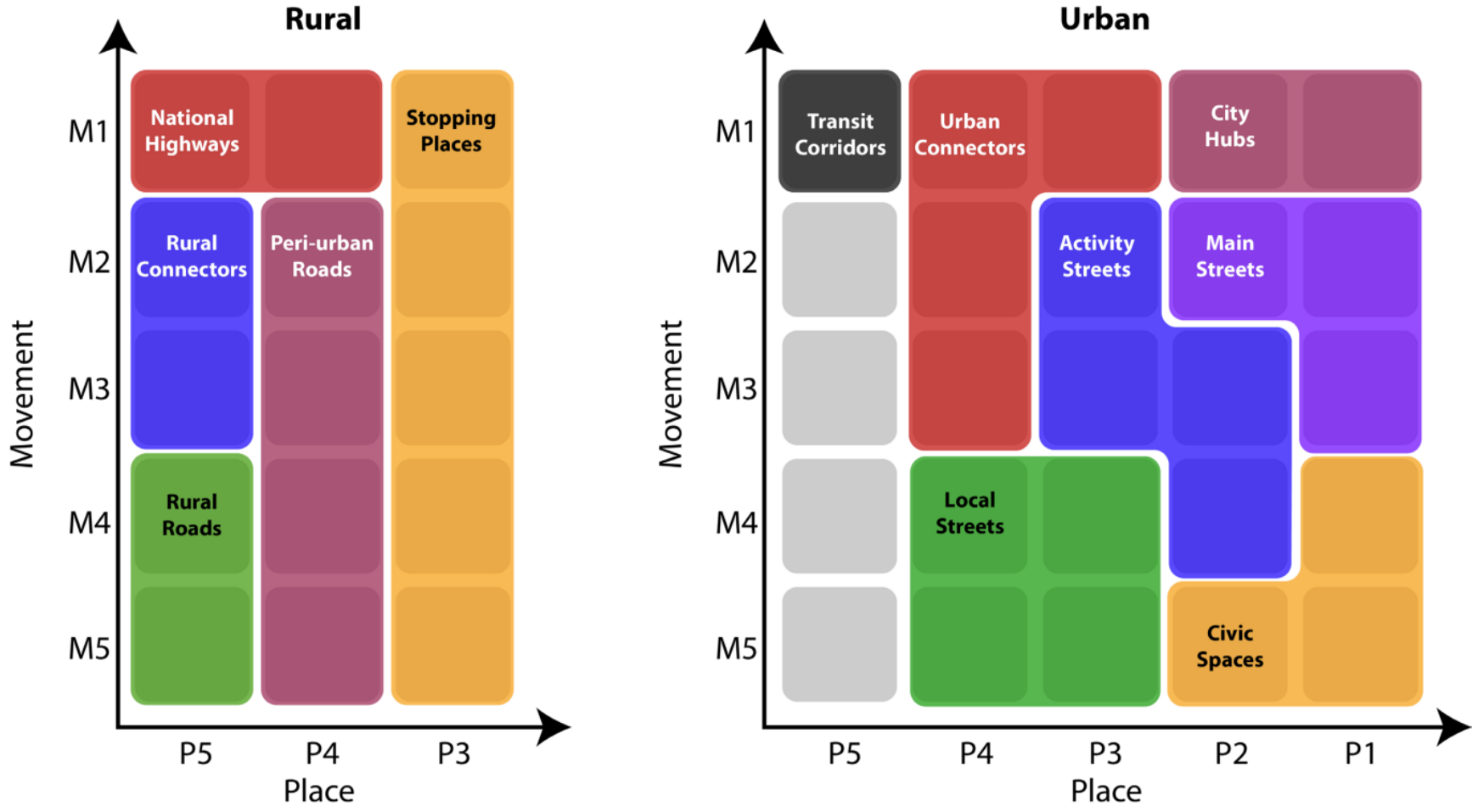
MOVEMENT AND PLACE FRAMEWORK



Source: Federal Highway Administration

The Caltrans Approach

MOVEMENT AND PLACE FRAMEWORK



Source: New Zealand Transport Agency Waka Kotahi

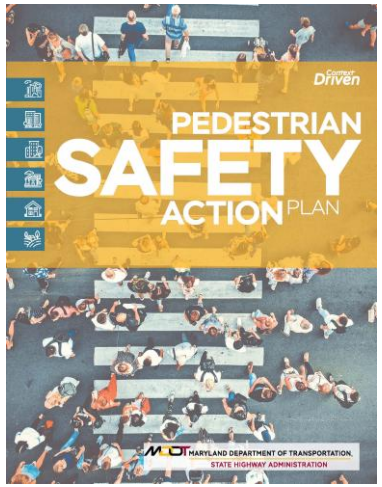
The Florida DOT Approach

CONTEXT CLASSIFICATION GUIDE

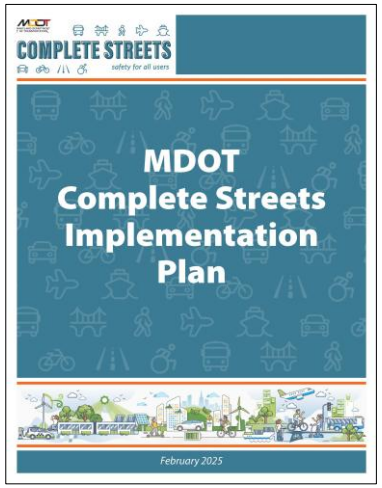
The Maryland DOT Approach

SERIOUS ABOUT SAFETY
MDOT MARYLAND DEPARTMENT OF TRANSPORTATION

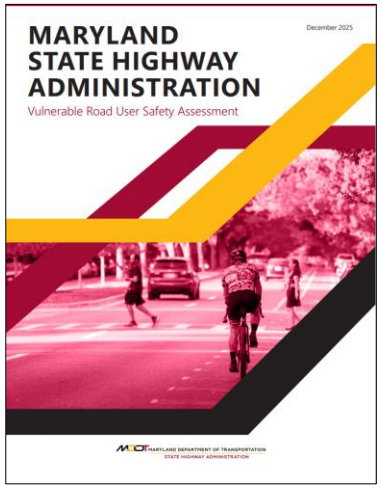
Context Driven: Access and Mobility for All Users (2020)



Pedestrian Safety Action Plan (2023)



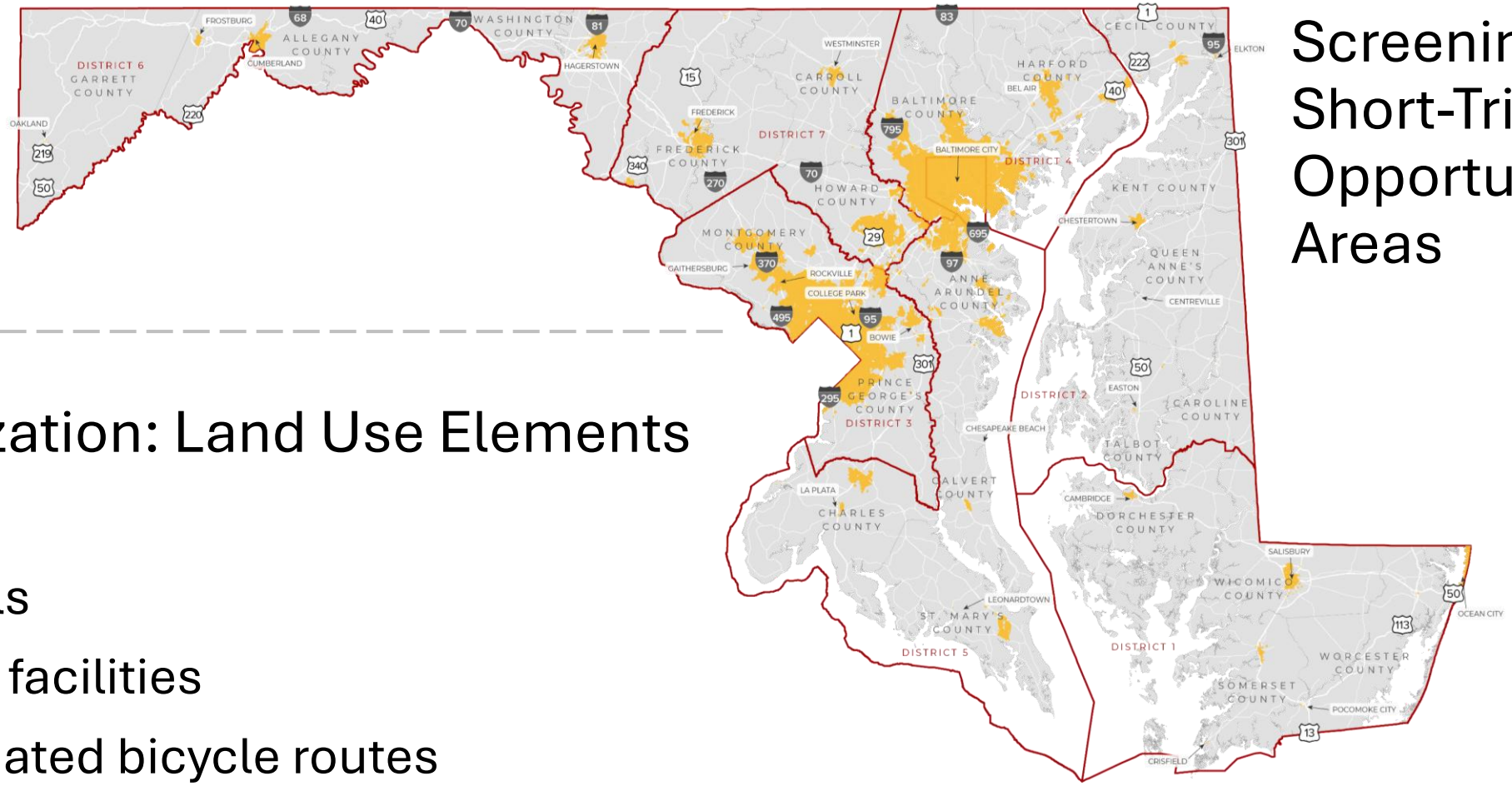
Model Complete Streets Initiative (2023-2025)



Vulnerable Road User Safety Assessments (2023, 2025)

The Maryland DOT Approach

SERIOUS ABOUT SAFETY
MDOT MARYLAND DEPARTMENT OF TRANSPORTATION



Screening: Short-Trip Opportunity Areas

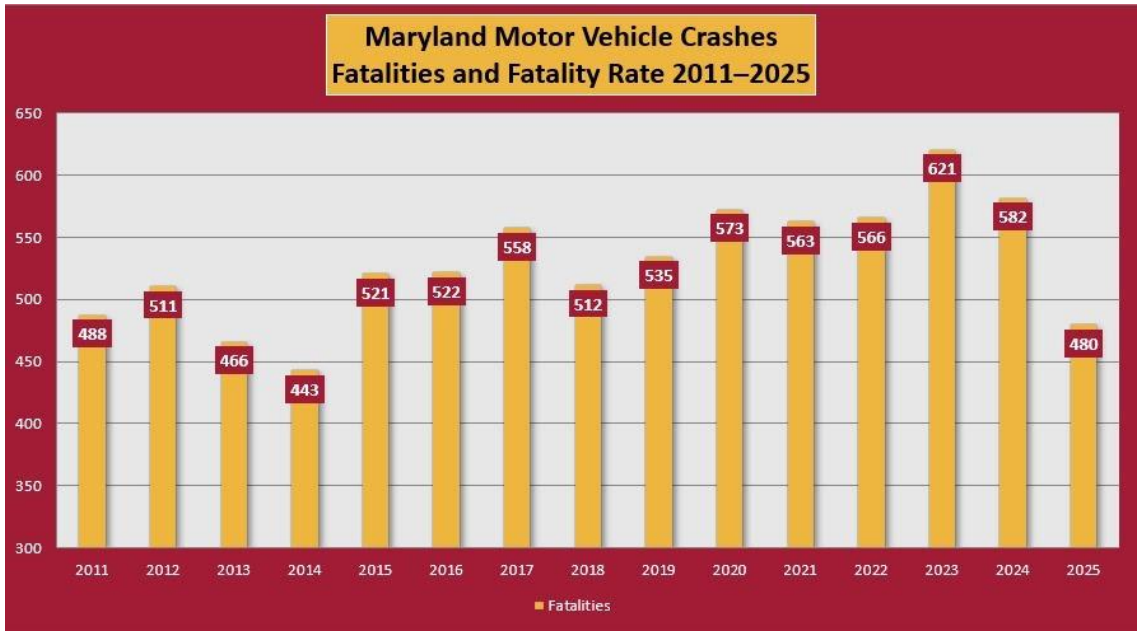
Prioritization: Land Use Elements

- STOAs
- Schools
- Transit facilities
- Designated bicycle routes

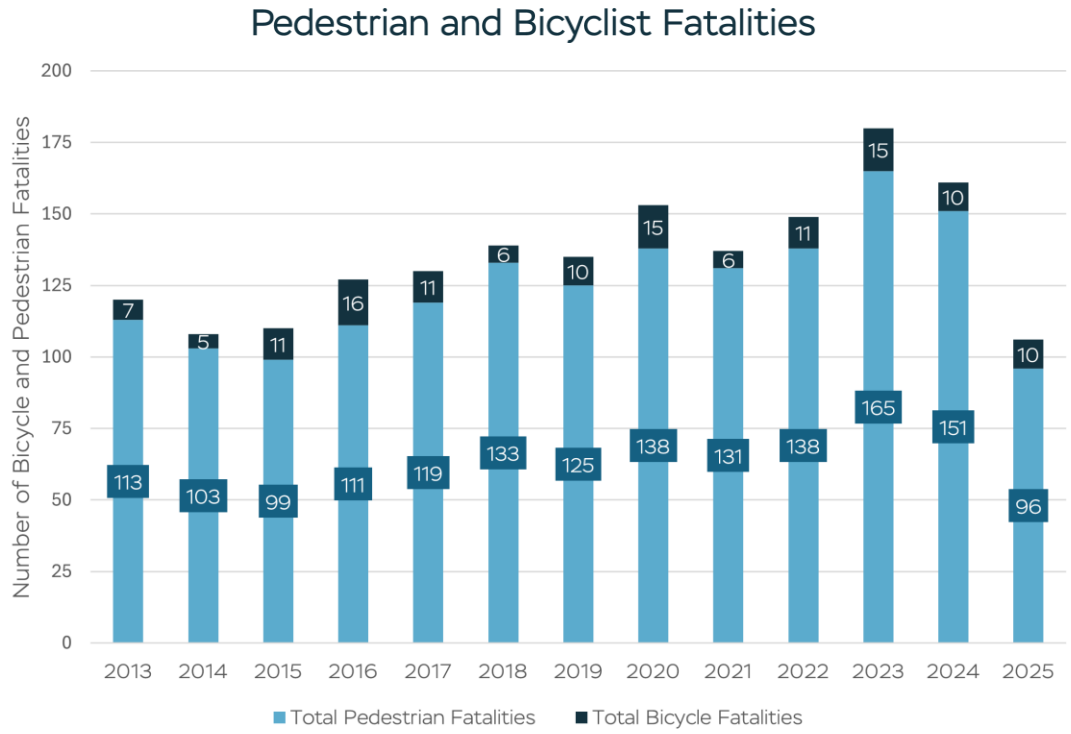
The Maryland DOT Approach

THE RESULTS SPEAK FOR THEMSELVES

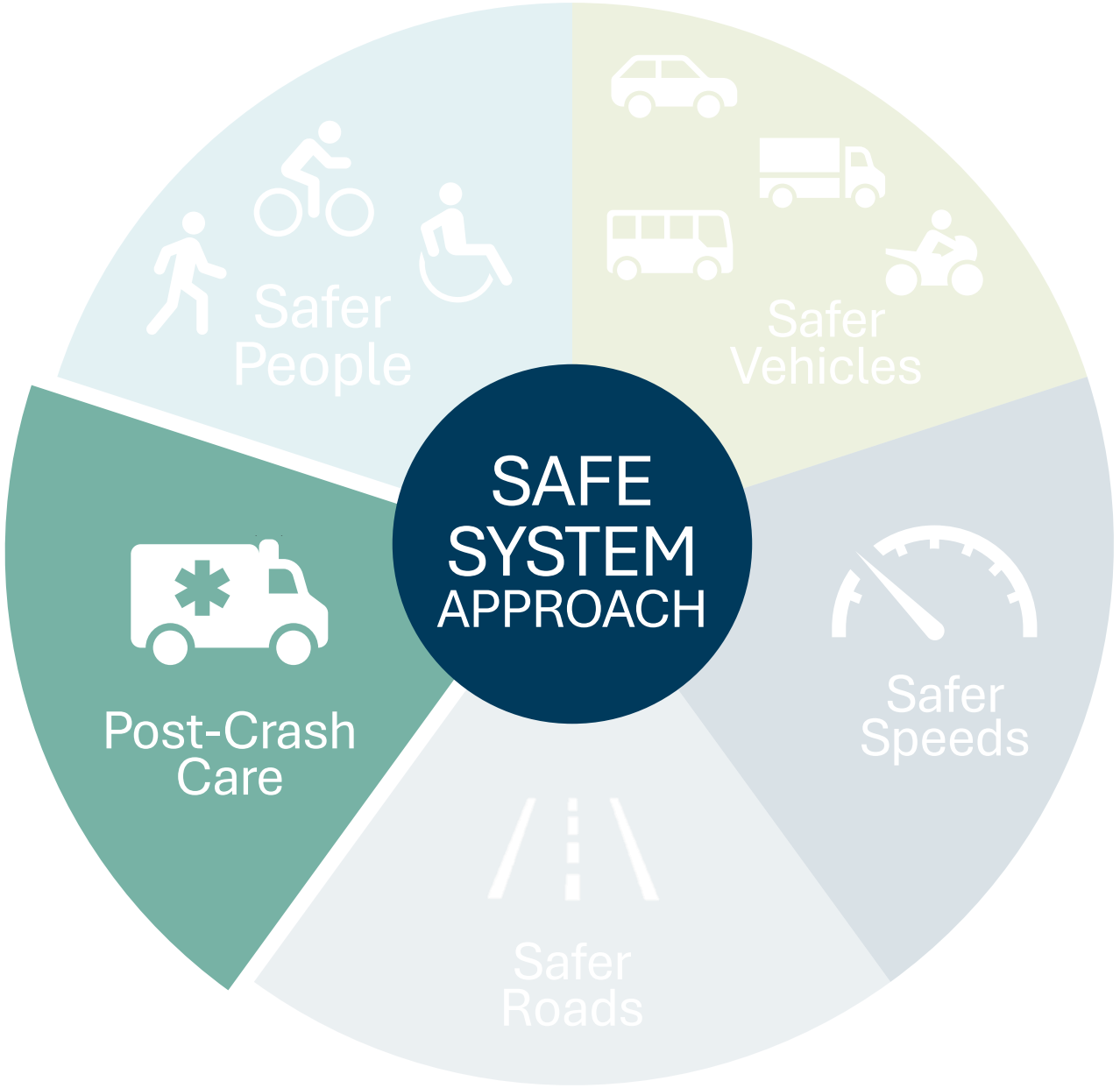
SERIOUS ABOUT SAFETY
MDOT MARYLAND DEPARTMENT OF TRANSPORTATION



23% in two years



41% in two years


Safer People
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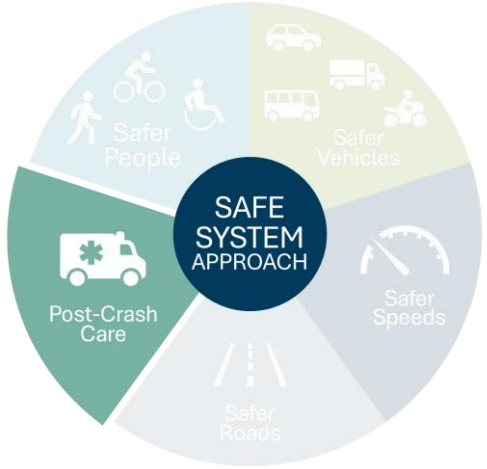
Safer Roads

Post-Crash Care Insights

Eric Tang, PE, RSP2IB



MCDITE Annual Meeting, Lancaster, PA

April 17, 2026

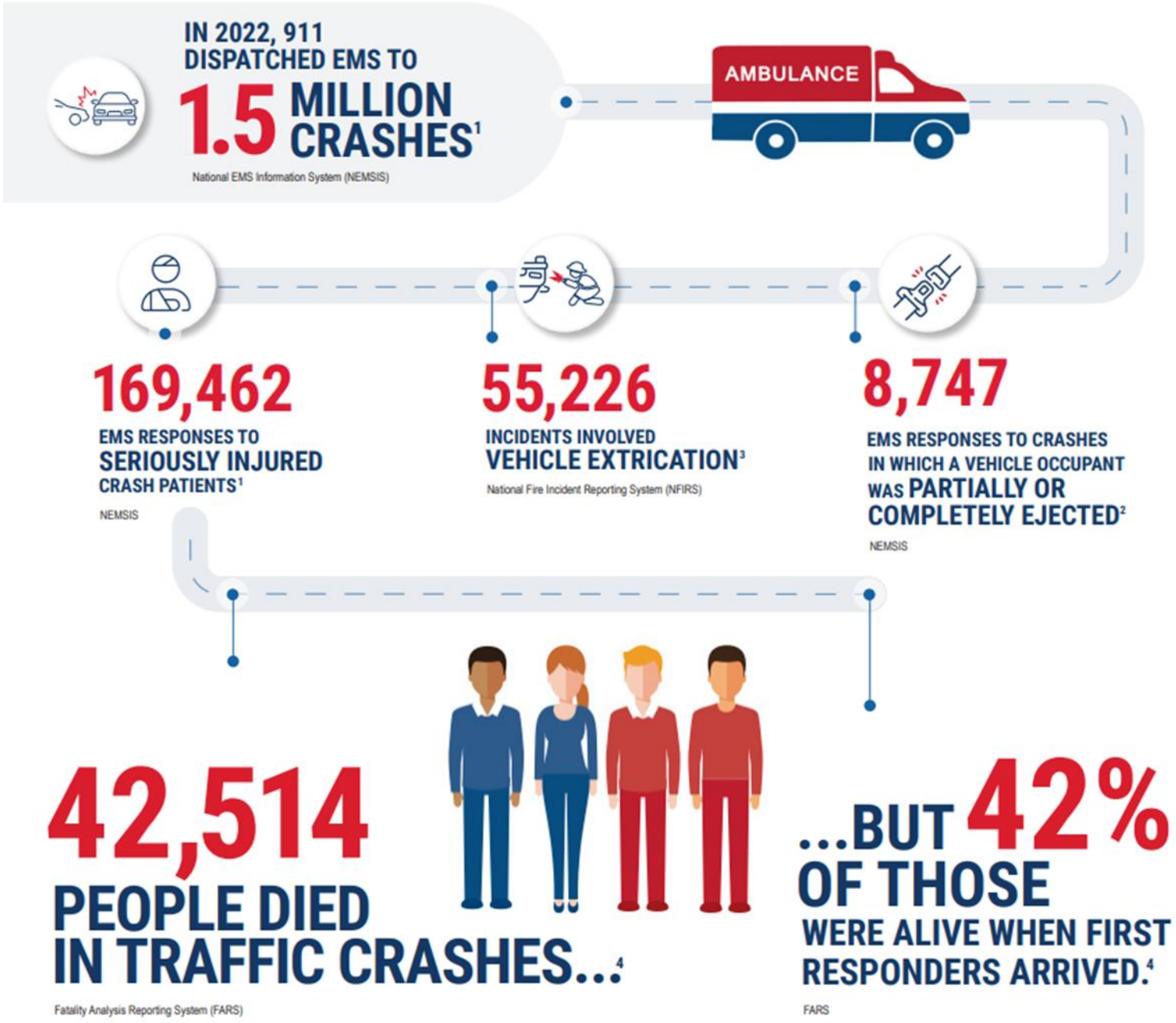
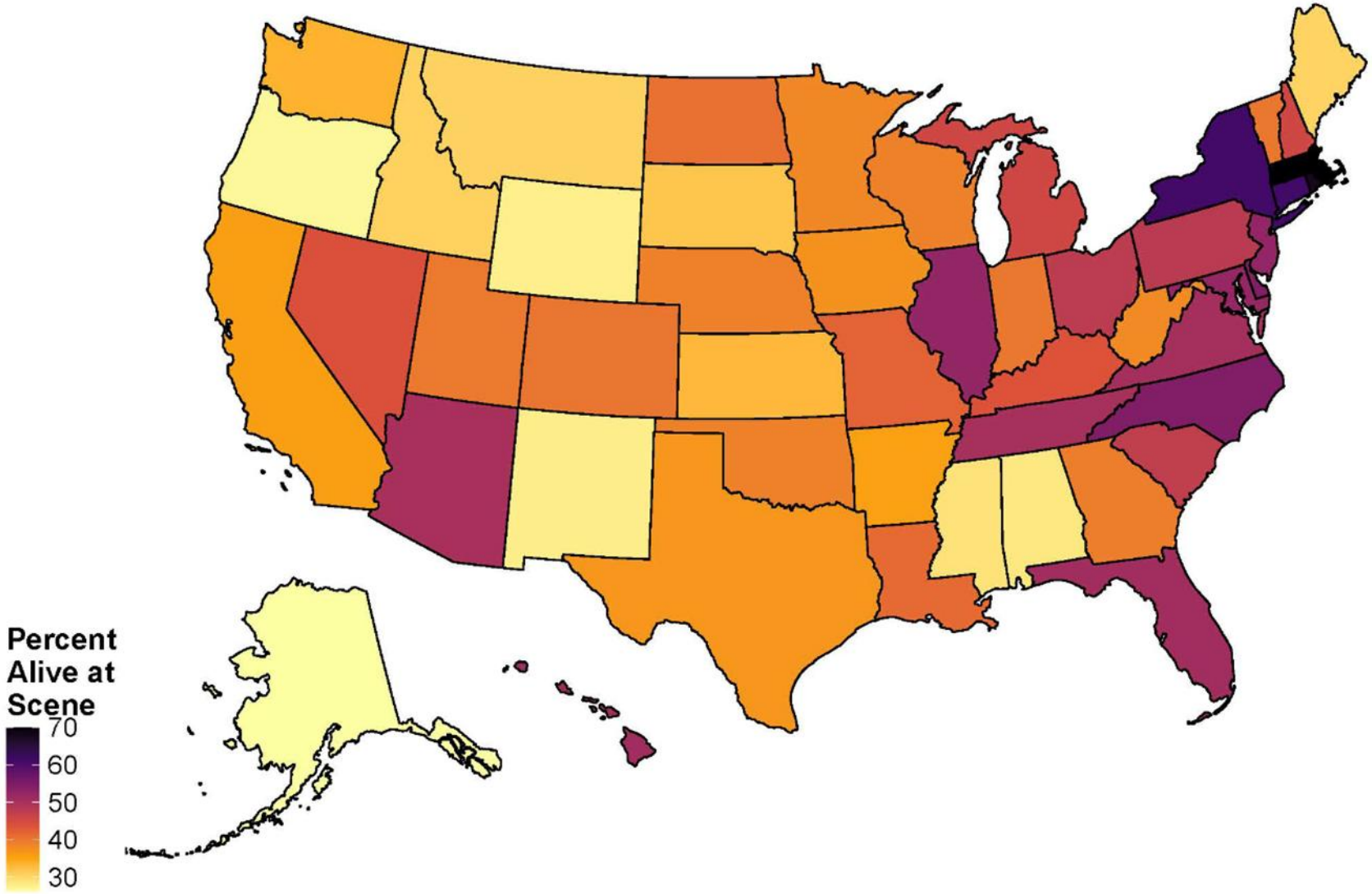


Image Credit: NHTSA

Percent of Motor Vehicle Crash Fatalities Who Were Alive At Scene Post-Crash by State, 2019-2023



Nationally, 43% of motor vehicle crash fatalities between 2019 and 2023 were alive at the scene when emergency services arrived but later died (within 30 days of the crash). Of these, about one-third occurred in rural areas and two-thirds in urban areas.

Selden Jr., R. Z. (2025, August). Percent of motor vehicle crash fatalities who were alive at scene post-crash by state, 2019-2023 (PowerPoint Slide. Report No. DOT HS 813 752). National Highway Traffic Safety Administration.

Source: NHTSA FARS 2019-2023

Why People Die in a Crash

The **number-one preventable cause of death** in trauma-related injuries is blood loss.[2]

People die when they don't have enough oxygenated blood in their body.[3]

When someone bleeds internally or externally, they can die in as **little as five minutes**.[4]

Image Credit: NHTSA

Emergency Medical Response Strategies

Image Credit: NHTSA

Dispatch Strategies

ADVANCED AUTOMATIC CRASH NOTIFICATION TO CENTERS

911 centers with optimal technology will receive crash location and severity information, which has the potential to **save 360 to 721 lives annually**.[5]

GEOGRAPHIC INFORMATION SYSTEM (GIS) DATA AVAILABLE TO 911

911-standard compliant addressing **data provides telecommunicators exact crash and caller location** to inform the most efficient dispatch of first responders.

Image Credit: NHTSA

911 Advances

911 OPERATIONS

- Structured protocols guide the dispatch of the appropriate emergency response and can include instructing bystanders to provide immediate care before help arrives.[5]
- Adequately staffed 911 centers with telecommunicators trained in Traffic Incident Management, help reduce the duration and impacts of traffic incidents, like secondary crashes.[6]

DATA COLLECTION

- Standardized data collection can help to better understand and prevent crashes.[7]

INTEROPERABILITY

- Enhancement of Computer Aided Dispatch interconnections (CAD-to-CAD) support 911 dispatch of the most appropriate unit.[8]
- Advanced Automatic Crash Notification technology allows 911 centers to receive critical information, including severity, having the potential to save 360 to 721 lives annually.[9]

GEOGRAPHIC INFORMATION SYSTEMS (GIS)

- Next Generation 911-compliant addressing data provides telecommunicators with exact incident location.[10]

Image Credit: NHTSA

On-Scene Strategies

CALL-TAKING PROTOCOLS

Just **43% of 911 centers** follow Emergency Medical Dispatch protocols, which guide telecommunicators to both dispatch the appropriate emergency responders and help callers provide immediate care before help arrives.[6]

PREHOSPITAL BLOOD TRANSFUSION

Severe blood loss is the **leading cause of preventable death** in trauma cases, and nearly half of patients die before they reach the hospital. Prehospital blood transfusion is proven to **reduce mortality by 37%** among trauma patients.[2]

BYSTANDER CARE

Witnesses to a crash can **quickly provide lifesaving care**, such as applying a tourniquet,[2] using an AED or delivering CPR.

RAPID EXTRICATION

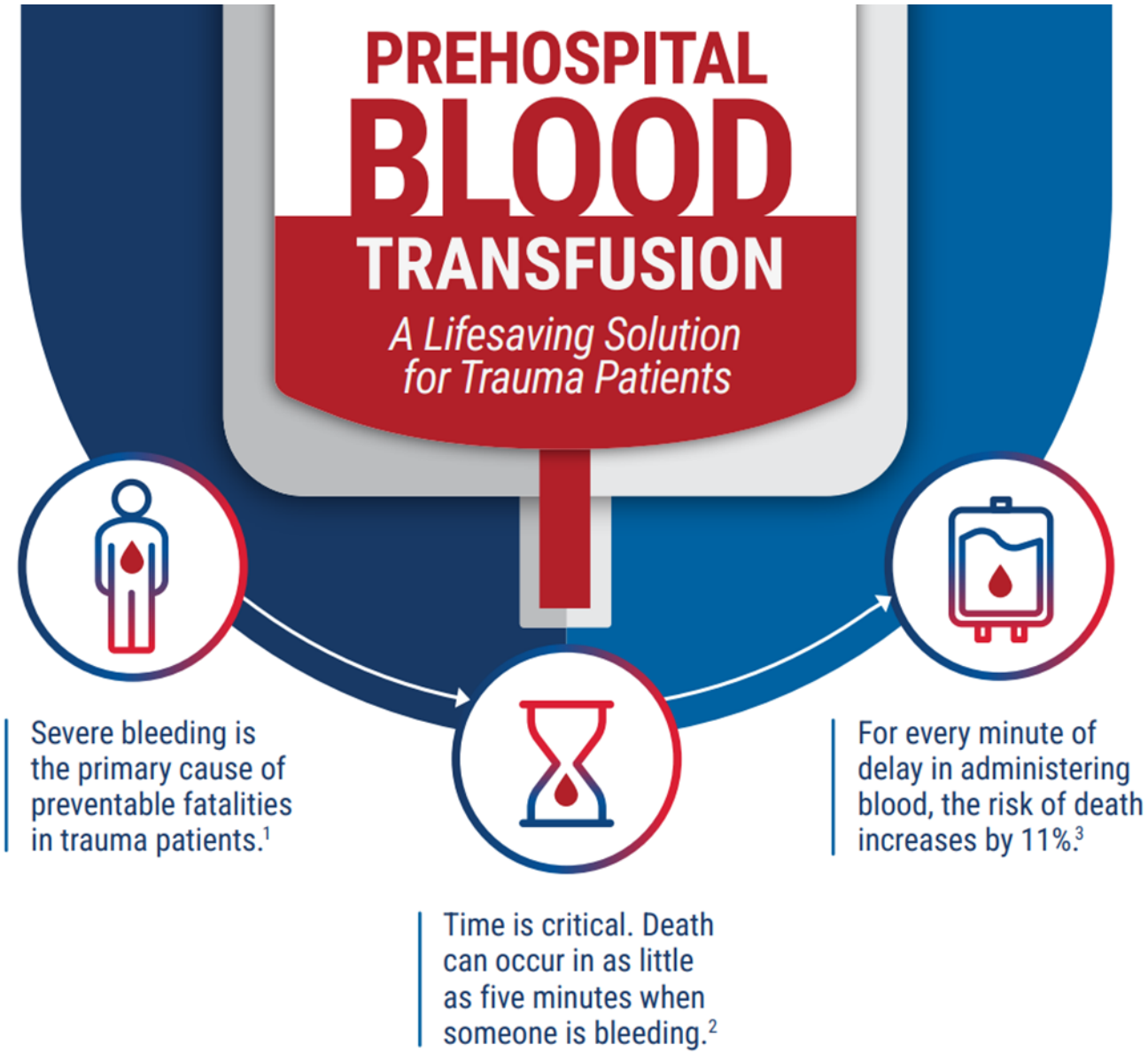
Crash victims who are trapped in a vehicle are **more likely to die** and have time-critical injuries requiring intervention.[7]

Image Credit: NHTSA

Prehospital Blood Transfusion Program

EMS clinicians deliver whole blood or components (packed red blood cells, plasma, platelets) to severely bleeding patient

- Stakeholder Committee
- Equipment
- Education and Training
- Blood-Sharing Network
- Data
- Guidelines



Check with regulatory agency about licensures and requirements to allow paramedics and other EMS personnel to administer blood in the field

Image Credit: NHTSA

Prehospital Blood Transfusion Location Map

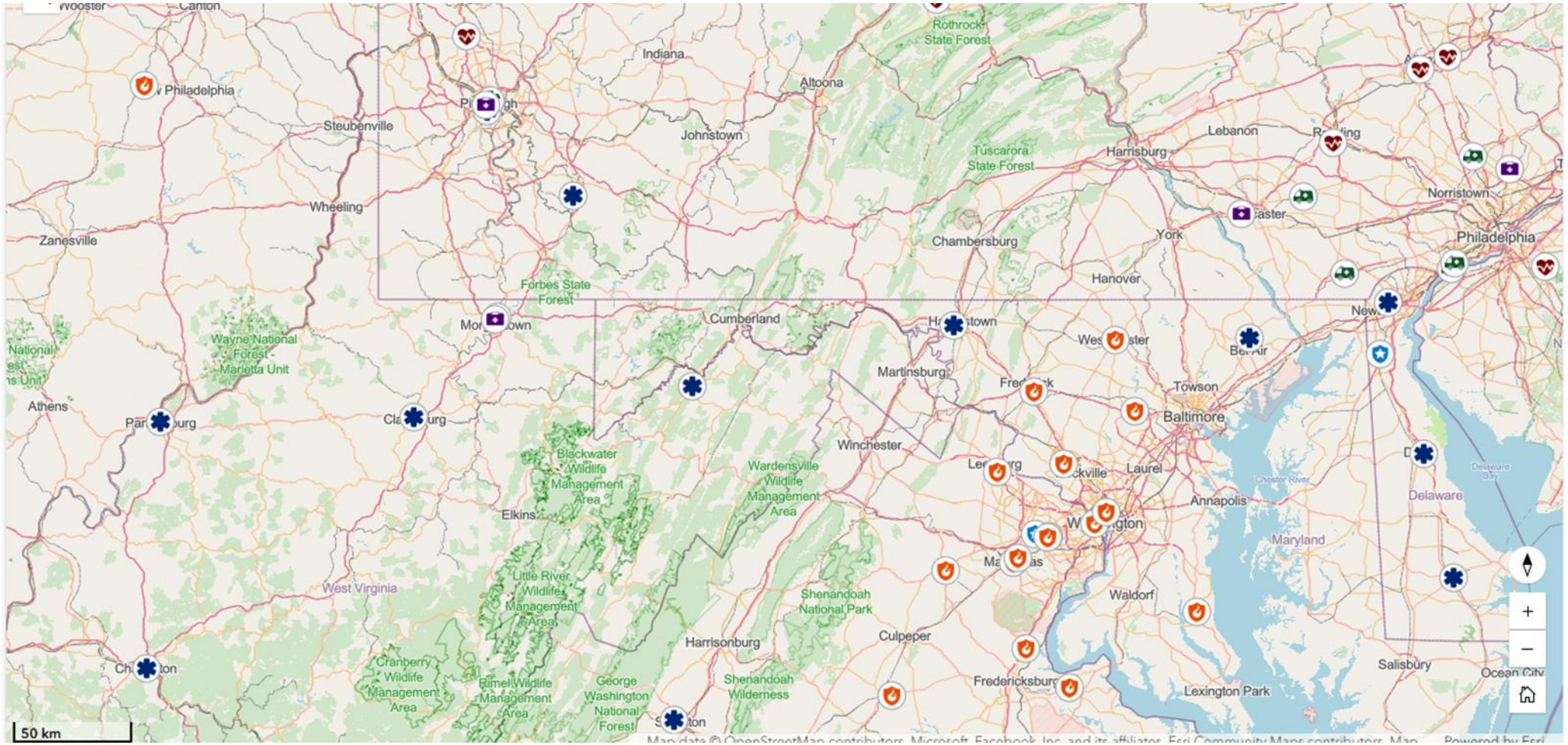


Image Credit: PHBTC

Success Stories

CoP EMS Celebrates the Formal Launch of Whole Blood in the Field

Published on September 26, 2025

The collaborative program—a partnership between the City, UPMC, and Vitalant—provides a major life-saving benefit to our city

Pittsburgh, PA – The City of Pittsburgh Bureau of Emergency Medical Services (EMS) is proud to announce the launch of whole blood in the field being deployed by paramedics across the city of Pittsburgh. This cooperative program is a joint effort between Pittsburgh EMS, UPMC prehospital services, and Vitalant and sees whole blood being administered directly to patients in the field.

Pittsburgh EMS led the way in Pennsylvania by launching a pilot program in 2022 that paired paramedics with prehospital physicians to transfuse blood to patients in the field and save lives right at the scene.

Delaware State Police

Superintendent Colonel William D. Crotty

Listen

Delaware State Police Partners with Blood Bank of Delmarva to Announce Pre-Hospital Whole Blood Program During Trauma Care

Date Posted: *Monday, February 17th, 2025*

Through New Jersey Department of Health waivers, NJ paramedics now provide emergency blood transfusions

Life-saving improvisation sparks new prehospital blood program in rural West Virginia

A traumatic crash and weather-grounded helicopter pushed Mineral County EMS to rethink how blood reaches patients

GW Hospital Celebrates One Year of Providing Whole Blood to DC EMS

July 21, 2025 | News

Prince William County Fire and Rescue Launches Advanced Care Field Operations Program to Save Lives

Friday, 07 Nov 2025 | Department of Fire and Rescue

Washington County Division of Emergency Services Launches Whole Blood Program

Transport Strategy

TRANSPORT VICTIMS TO APPROPRIATE CARE ACCORDING TO NATIONAL FIELD TRIAGE GUIDELINES.

Organized trauma care systems **reduce mortality from motor vehicle crashes by 8%.**[8]

Image Credit: NHTSA

Programmatic Strategies

HIGHWAY SAFETY PLANNING THAT INCLUDES POST-CRASH CARE

By working together on strategies that improve prehospital care, EMS agencies and State Highway Safety Offices can **reduce the number of motor-vehicle crash fatalities.**[9]

TRAFFIC INCIDENT MANAGEMENT (TIM) TRAINING FOR 911 & EMS

Approximately 30% of EMS professionals were TIM-trained by 2022.[10]

FULLY STAFFED AND RESOURCED 911 AND EMS SYSTEMS

More than half of 911 centers[11] and many EMS systems[12] are experiencing a staffing crisis.

APPLYING DATA FOR CONTINUOUS IMPROVEMENT

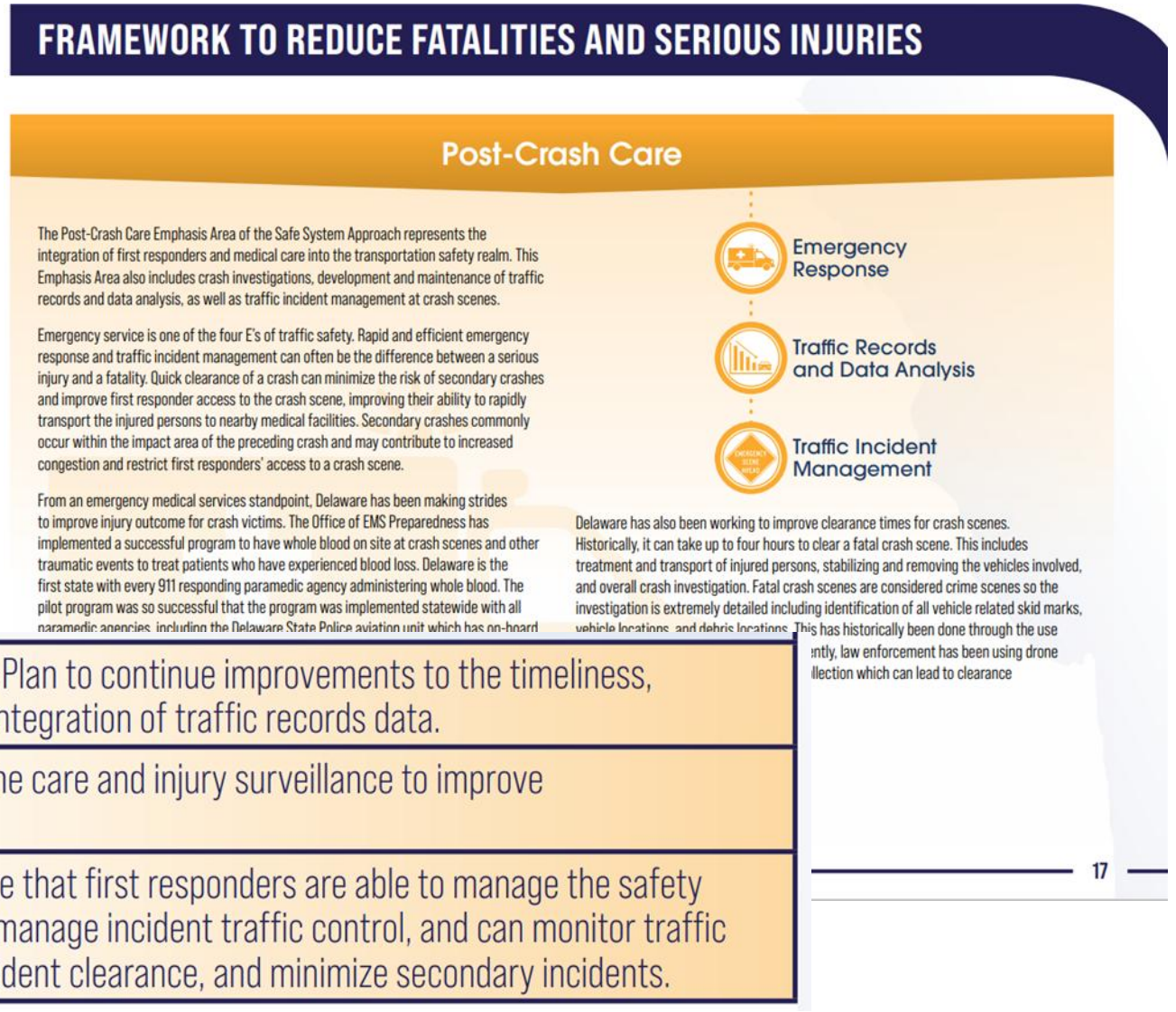
Access EMS crash data through the National EMS Information System (NEMSIS) database to identify problems and opportunities for improvement and prevention.

Image Credit: NHTSA

Post-Crash Care in Safety Planning

- Look at opportunities to improve your State or locality's EMS data
- Work with EMS officials and Highway Safety Offices to identify crash prevention and post-crash care challenges
- Integrate Post-Crash Care into your safety plan

Delaware SHSP Post-Crash Care



FRAMEWORK TO REDUCE FATALITIES AND SERIOUS INJURIES

Post-Crash Care

The Post-Crash Care Emphasis Area of the Safe System Approach represents the integration of first responders and medical care into the transportation safety realm. This Emphasis Area also includes crash investigations, development and maintenance of traffic records and data analysis, as well as traffic incident management at crash scenes.

Emergency service is one of the four E's of traffic safety. Rapid and efficient emergency response and traffic incident management can often be the difference between a serious injury and a fatality. Quick clearance of a crash can minimize the risk of secondary crashes and improve first responder access to the crash scene, improving their ability to rapidly transport the injured persons to nearby medical facilities. Secondary crashes commonly occur within the impact area of the preceding crash and may contribute to increased congestion and restrict first responders' access to a crash scene.

From an emergency medical services standpoint, Delaware has been making strides to improve injury outcome for crash victims. The Office of EMS Preparedness has implemented a successful program to have whole blood on site at crash scenes and other traumatic events to treat patients who have experienced blood loss. Delaware is the first state with every 911 responding paramedic agency administering whole blood. The pilot program was so successful that the program was implemented statewide with all

Emergency Response

Traffic Records and Data Analysis

Traffic Incident Management

Delaware has also been working to improve clearance times for crash scenes. Historically, it can take up to four hours to clear a fatal crash scene. This includes treatment and transport of injured persons, stabilizing and removing the vehicles involved, and overall crash investigation. Fatal crash scenes are considered crime scenes so the investigation is extremely detailed including identification of all vehicle related skid marks, vehicle locations, and debris locations. This has historically been done through the use

ntly, law enforcement has been using drone

llection which can lead to clearance

17

Post Crash Care	
	Implement the actions of the Traffic Records Strategic Plan to continue improvements to the timeliness, accuracy, completeness, uniformity, accessibility and integration of traffic records data.
	Continue the development of improvements to on-scene care and injury surveillance to improve injury outcomes for victims of crashes.
	Review programs and consider improvements to ensure that first responders are able to manage the safety of on-scene personnel, have appropriate resources to manage incident traffic control, and can monitor traffic impacts to improve first responder safety, improve incident clearance, and minimize secondary incidents.

Image Credit: DelDOT

SS4A Funding for Post-Crash Care

- 2025 USDOT Safe Streets and Roads for All
  - 48 projects involving EMS and/or whole blood projects
  - Centre Region COG connected vehicle digital safety alert tech pilot
  - Westmoreland County TIM system

- Prehospital Blood Transfusion Response Models
- Emergency Response Coordination and Communications Improvements
- Post Crash Care and Trauma Response System Enhancements

Resources

- USDOT Post-Crash Care website
  - https://www.transportation.gov/safe-system-approach/post-crash-care
- EMS
  - https://www.ems.gov/issues/ems-highway-safety-and-post-crash-care/
- 911
  - https://www.911.gov/
- Prehospital Blood Transfusion Coalition Map
  - https://prehospitaltransfusion.org/blood-program-interactive-map/

Roundtable / Questions

Thank You!

SAFER PEOPLE / SAFER SPEEDS
Ginny O'Connor, PE, PTOE, RSP2I
virginia.oconnor@toxcel.com

SAFER VEHICLES
Sushant Jagtap
sjagtap@iihs.org

SAFER ROADS / SAFER LAND USE
Jeff Riegner, PE, AICP, PTOE, RSP1
jriegner@kittelson.com

POST-CRASH CARE
Eric Tang, PE, RSP1, RSP2B
etang@vhb.com

MODERATOR
Emily Hufnal
emily.hufnal@delaware.gov