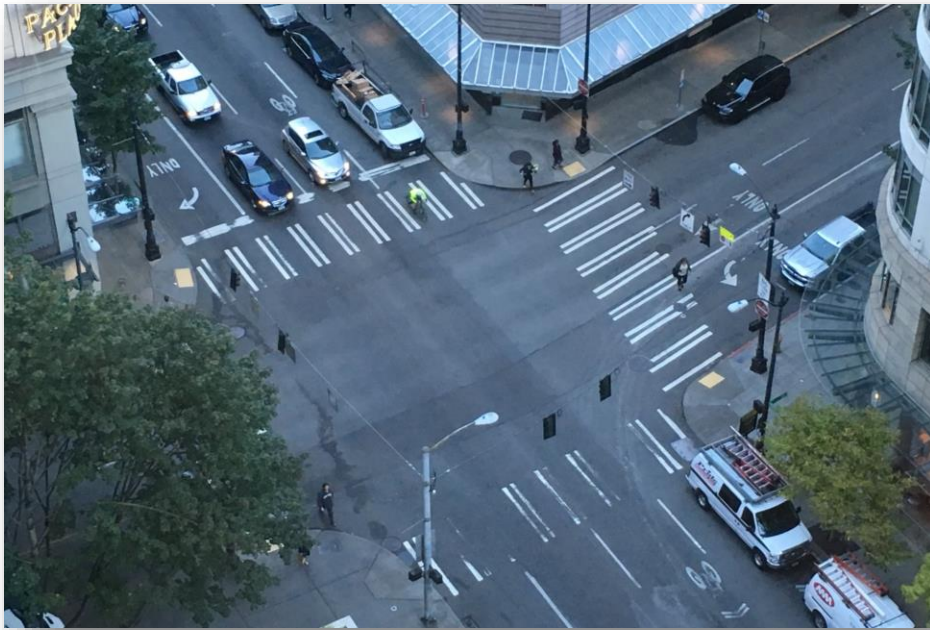


Safety Performance Measures for Pedestrians and Bicyclists



Amy Schick

National Highway Traffic Safety
Administration

Dave Kopacz

Federal Highway Administration

December 14, 2017



Housekeeping

⇒ **Problems with audio?**

Dial into the phone line instead of using “mic & speakers”

⇒ **Webinar issues?**

Re-Load the webpage and log back into the webinar. Or send note of an issue through the Question box.

⇒ **Questions?**

Submit your questions at any time in the Questions box.



Archive and Certificates

Archive posted at www.pedbikeinfo.org/webinars

- ⇒ Copy of presentations
- ⇒ Recording (within 1-2 days)
- ⇒ Links to resources

Follow-up email will include...

- ⇒ Link to certificate of attendance
- ⇒ Information about webinar archive



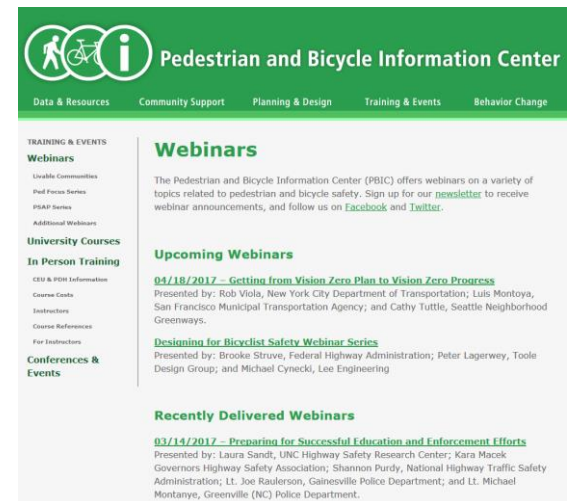
Webinars and News

⇒ Find upcoming webinars and webinar archives at pedbikeinfo.org/webinars

⇒ Follow us for the latest PBIC News
facebook.com/pedbikeinfo
twitter.com/pedbikeinfo

⇒ Join the conversation using **#PBICWebinar**

⇒ Sign up for our mailing list
pedbikeinfo.org/signup



The screenshot shows the website for the Pedestrian and Bicycle Information Center (PBIC). The header includes the PBIC logo and navigation links: Data & Resources, Community Support, Planning & Design, Training & Events, and Behavior Change. The main content area is titled "Webinars" and contains the following text:

Webinars

The Pedestrian and Bicycle Information Center (PBIC) offers webinars on a variety of topics related to pedestrian and bicycle safety. Sign up for our [newsletter](#) to receive webinar announcements, and follow us on [Facebook](#) and [Twitter](#).

Upcoming Webinars

[04/18/2017 – Getting from Vision Zero Plan to Vision Zero Progress](#)
Presented by: Rob Viola, New York City Department of Transportation; Luis Montoya, San Francisco Municipal Transportation Agency; and Cathy Tuttle, Seattle Neighborhood Greenways.

[Designing for Bicyclist Safety Webinar Series](#)
Presented by: Brooke Struve, Federal Highway Administration; Peter Lagerwey, Toole Design Group; and Michael Cynecki, Lee Engineering

Recently Delivered Webinars

[03/14/2017 – Preparing for Successful Education and Enforcement Efforts](#)
Presented by: Laura Sandt, UNC Highway Safety Research Center; Kara Macek, Governors Highway Safety Association; Shannon Purdy, National Highway Traffic Safety Administration; LT. Joe Raulerson, Gainesville Police Department; and LT. Michael Montanye, Greenville (NC) Police Department.



The screenshot shows the Facebook page for the Pedestrian and Bicycle Information Center. The page features the PBIC logo, the name "Pedestrian and Bicycle Information Center", and the website URL www.pedbikeinfo.org. The page is categorized as a "Government Organization" and has 3,509 likes and 3,446 followers. The main content area displays a post titled "VISION ZERO STRATEGIES SERIES" with a photo of a person in a high-visibility vest interacting with a cyclist. The post is labeled "Webinar" and "Twitter #VZChat". The page also includes a navigation menu on the left with options like Home, About, Photos, Likes, Videos, Posts, and Events, and a "Send Message" button.



Safety Performance Measures for Pedestrians and Bicyclists

December 14, 2017





Agenda

- Data Overview
- NHTSA Target Setting Requirements
- Model Minimum Uniform Crash Criteria (MMUCC) and Serious Injury Reporting Requirements
- References and Resources



2016 Data Overview



- **37,461** people died on our highways.
 - An increase of 1,976 fatalities from 2015
- **Fatalities increased by 5.6%**
 - Following a 8.4% increase in 2015
 - 9.4-percent increase from 1963 to 1964
- **VMT increased by 2.2%**
 - Following a 2.3% increase in 2015
- **Fatality rate increased by 2.6%**
 - Following a 6.5% increase in 2015



Pedestrian and Pedalcyclists Defined (FARS)

- NHTSA's Fatality Analysis Reporting System (FARS) defines a pedestrian as any person on foot, walking, running, jogging, hiking, sitting, or lying down.
- Pedalcyclists defined are bicyclists and other cyclists including riders of two-wheel, nonmotorized vehicles, tricycles, and unicycles powered solely by pedals.
- The FARS dataset does not include pedestrian and bicycle crashes that do not involve motor vehicles.
- Motor vehicle crashes that occurred on private property, including parking lots and driveways, are excluded.



- **5,987** pedestrian fatalities in 2016
 - Pedestrian fatalities increased by 492 (a 9.0% increase), and are at their highest number since 1990.
- **840** pedalcyclists fatalities in 2016
 - Pedalcyclist fatalities increased by 11 (a 1.3% increase), and are at their highest number since 1991.



Fatalities by Person Type, 2007-2016

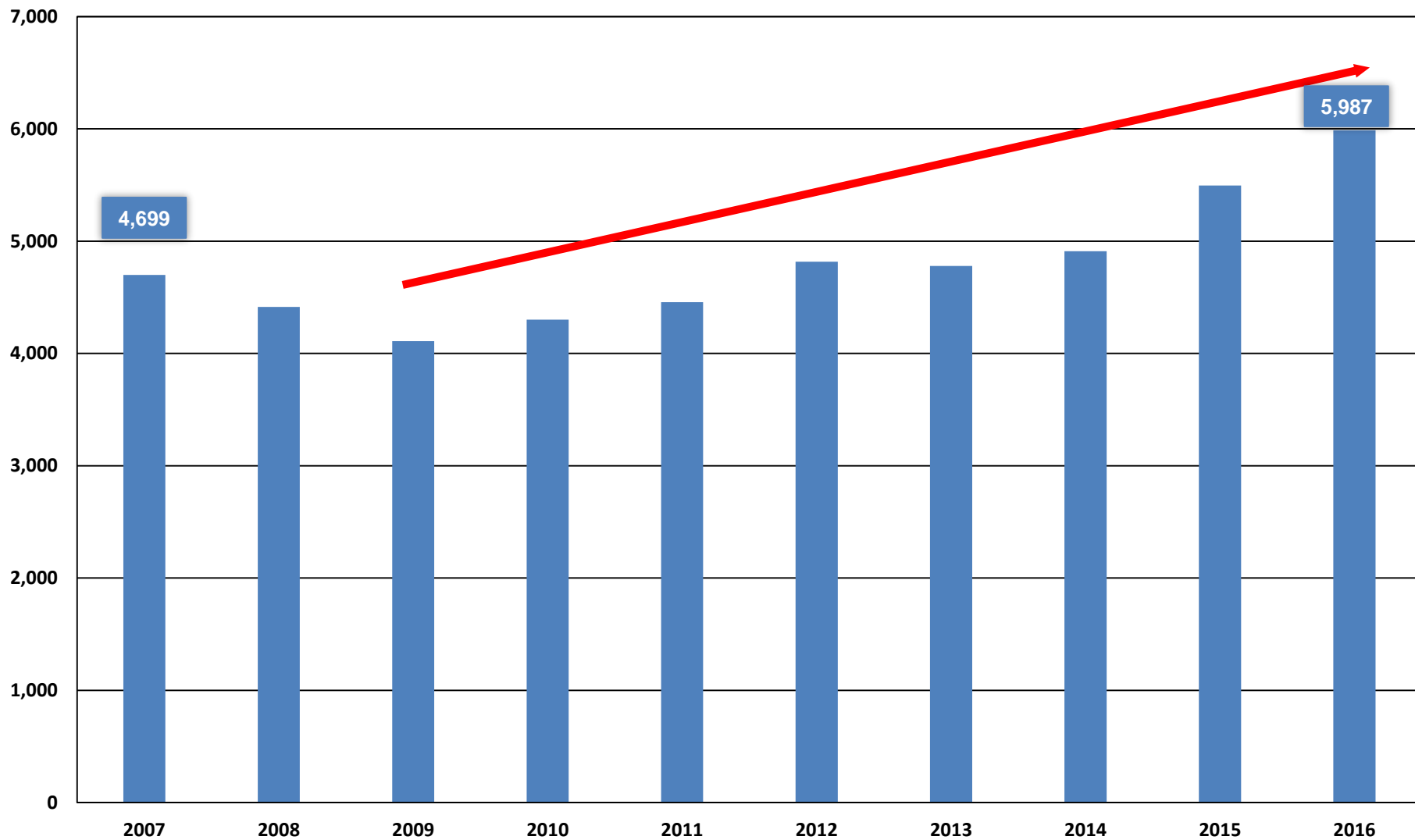
Year	Occupants					Nonoccupants			Total*
	Passenger Vehicles			Large Trucks	Motorcycles	Pedestrians	Pedalcyclists	Other/ Unknown Nonoccupants	
	Passenger Cars	Light Trucks	Total						
2007	16,614	12,458	29,072	805	5,174	4,699	701	158	41,259
2008	14,646	10,816	25,462	682	5,312	4,414	718	188	37,423
2009	13,135	10,312	23,447	499	4,469	4,109	628	151	33,883
2010	12,491	9,782	22,273	530	4,518	4,302	623	185	32,999
2011	12,014	9,302	21,316	640	4,630	4,457	682	200	32,479
2012	12,361	9,418	21,779	697	4,986	4,818	734	227	33,782
2013	12,037	9,186	21,223	695	4,692	4,779	749	190	32,893
2014	11,947	9,103	21,050	656	4,594	4,910	729	204	32,744
2015	12,761	9,878	22,639	665	5,029	5,495	829	235	35,485
2016	13,412	10,302	23,714	722	5,286	5,987	840	252	37,461

Source: FARS 2007-2015 Final, 2016 ARF

* Includes occupants of buses and other/unknown vehicles.



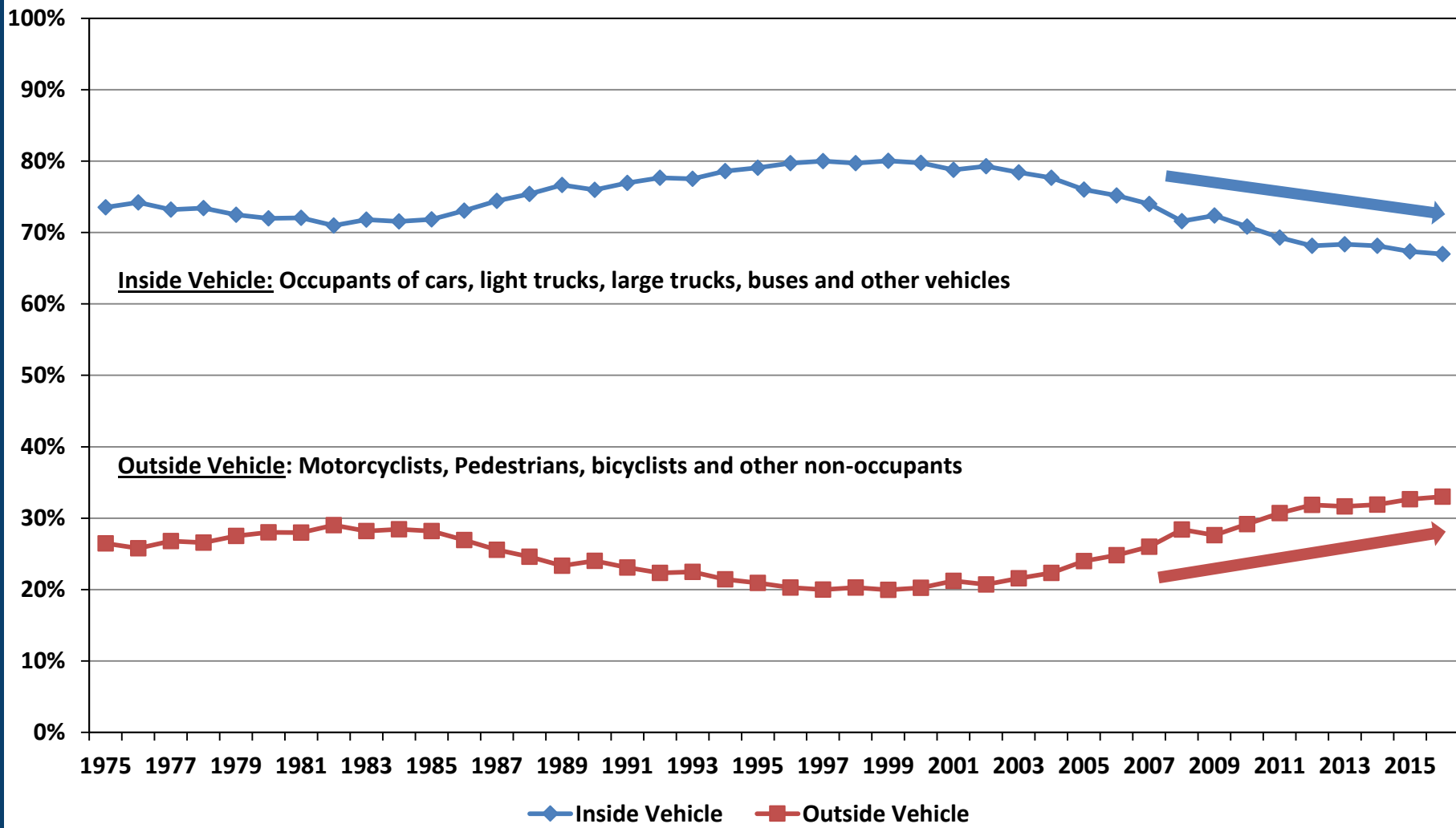
Pedestrian Fatalities



Source: FARS



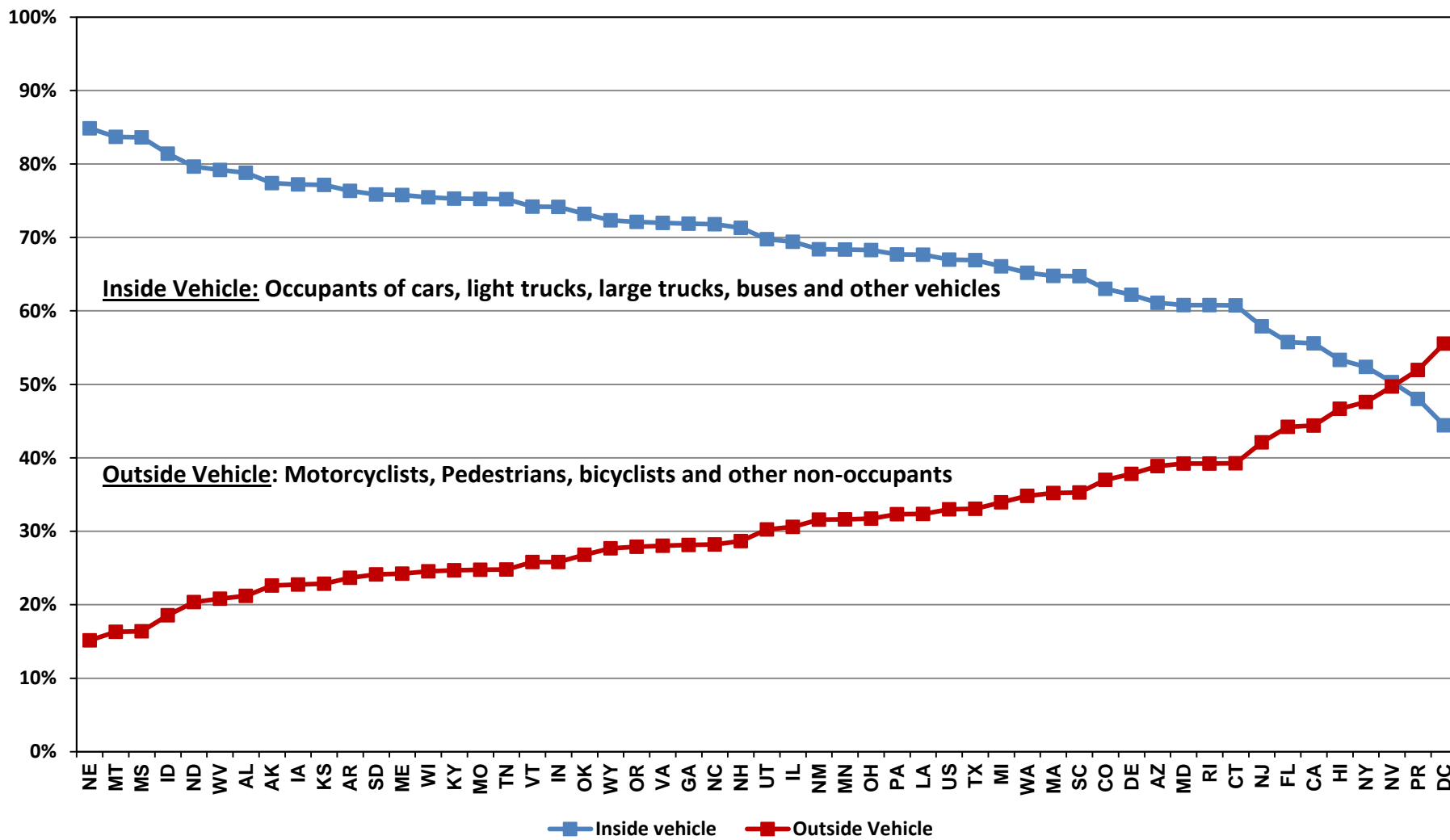
Proportion of Fatalities by Road User, 1975-2016



Source: FARS



Proportion of Fatalities by Road User, by State, 2016



Source: FARS



National Injury Estimates

- The Crash Report Sampling System (CRSS) builds on the retiring, long running National Automotive Sampling System General Estimates System (NASS GES).
- CRSS is a sample of police-reported crashes involving all types of motor vehicles, pedestrians, and cyclists, ranging from property-damage-only crashes to those that result in fatalities.
- CRSS is used to estimate the overall crash picture, identify highway safety problem areas, measure trends, drive consumer information initiatives, and form the basis for cost and benefit analyses of highway safety initiatives and regulations.



How the Crash Report Sampling System (CRSS) works?

- CRSS obtains its data from a nationally representative probability sample selected from the estimated 5 to 6 million police-reported crashes that occur annually.
- These crash reports are chosen from 60 selected areas across the United States that reflect the geography, population, miles driven, and crashes in the United States.
- CRSS data collectors review crash reports from hundreds of law enforcement agencies within the sites, randomly sampling tens of thousands of crash reports each year.



NHTSA Target Setting Requirements



Background

- In 2008, States voluntarily agreed to include annual performance measures, beginning with their fiscal year (FY) 2010 Highway Safety Plans (HSPs).
 - The HSP, submitted by State Highway Safety Offices, includes a description of all funds to be used to improve *behavioral* traffic safety.
- Beginning in FY 2014, States were required to include performance measures, and data driven (evidence-based) targets for each measure
- States are required to have an approved HSP, containing 15 core outcome measures, to receive Section 402 State and Community Highway Safety Grants.



NHTSA Required Core “Outcome” Measures

- Number of Fatalities
- Rate of Fatalities per 100 million VMT
- Number of Serious Injuries
- Number of:
 - Unrestrained passenger vehicle occupant fatalities, all seat positions
 - Fatalities in crashes involving a driver or motorcycle operator with a BAC of .08 and above
 - Speeding-related fatalities
 - Motorcyclist fatalities
 - Unhelmeted motorcyclist fatalities
 - Drivers age 20 or younger involved in fatal crashes
 - **Pedestrian fatalities**
 - **Bicyclist fatalities**



Other Required Measures

Behavior Measure

- Observed seat belt use for passenger vehicles, front seat outboard occupants (survey)

Grant Activity Measures *(targets not required)*

- Number of seat belt citations issued during grant-funded enforcement activities
- Number of impaired driving arrests made during grant-funded enforcement activities
- Number of speeding citations issued during grant-funded enforcement activities



Supplemental Performance Measures

- The minimum set of performance measures addresses most but not all of the possible highway safety problem areas.
- For program areas where performance measures have not been jointly developed, for which States are using HSP funds, the State must develop its own performance measures (and targets) that are data-driven.



NHTSA Performance Measure Requirements

- Performance measures must include...
 - Documentation of current safety levels;
 - Quantifiable performance targets; and
 - Justification for each target that explains how the target is data-driven, including a discussion of the factors that influenced the performance target selection
- The process for selecting countermeasure strategies and projects should allow the State to meet its targets.
- Targets, whenever reasonable, should represent an improvement from the current status rather than a simple maintenance of the current rate.

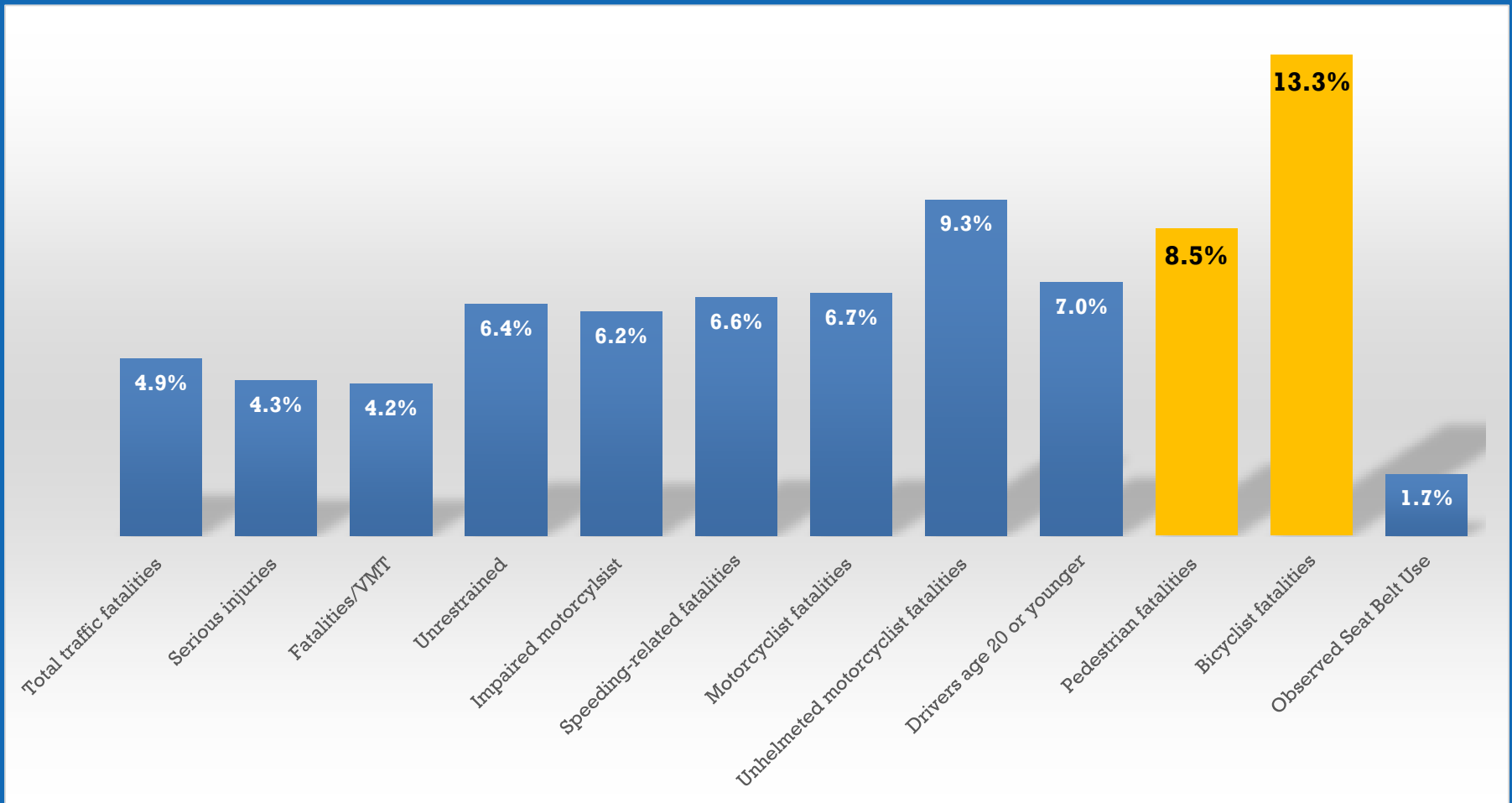


Basic Target Setting Processes

- ✓ Use trend analysis
- ✓ Consider external factors (e.g., economic activity, population, demographic distribution)
- ✓ Identify data on expected countermeasure strategy impact.
- ✓ Forecast fatality reductions based on planned implementation of countermeasure strategies



Average Projected Improvements for 2014 and 2015



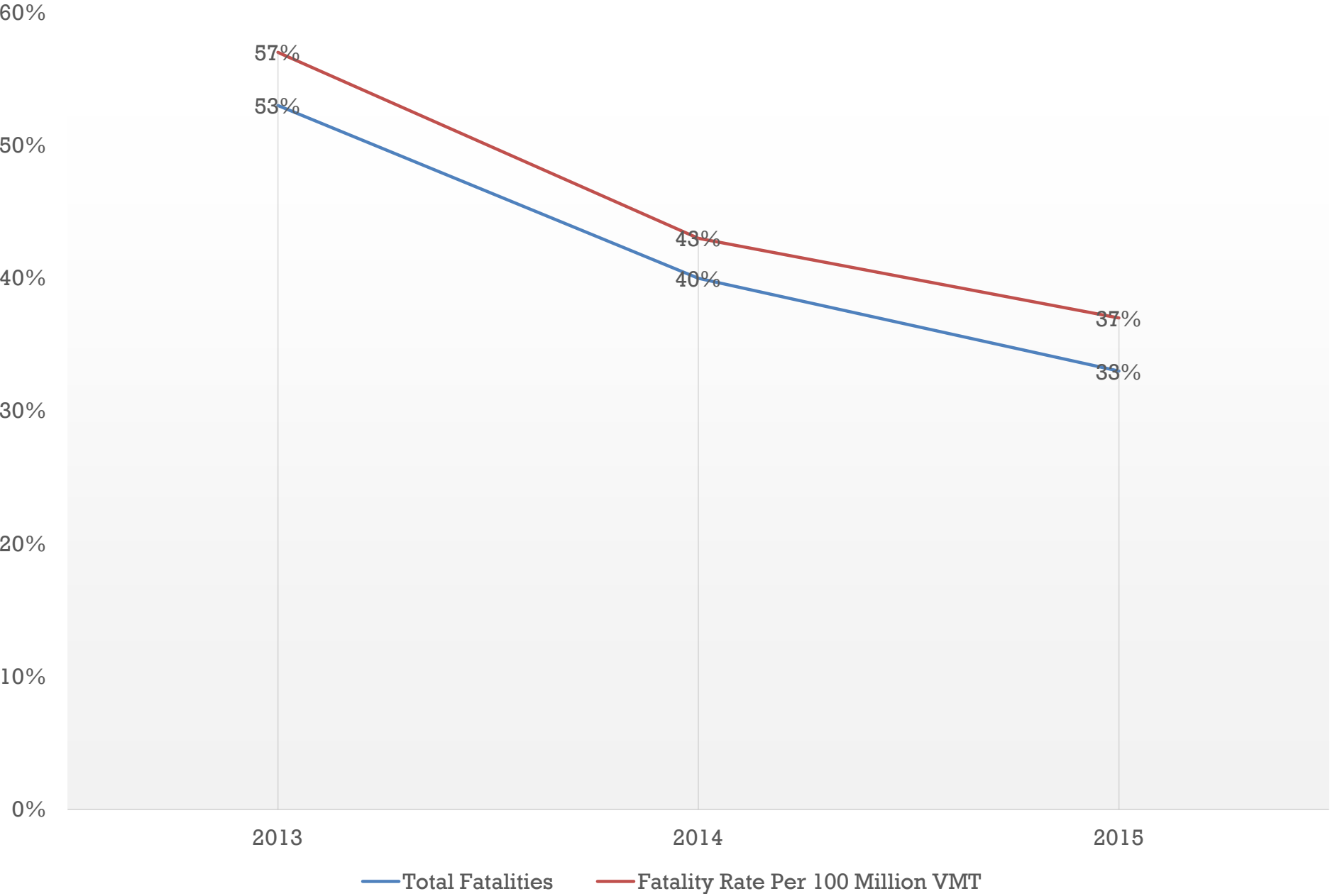
Average projected improvements for 2014 and 2015 when compared to 3-Year Average Baselines, 2010-2012 for 2014 targets and 2011-2013 for 2015 targets



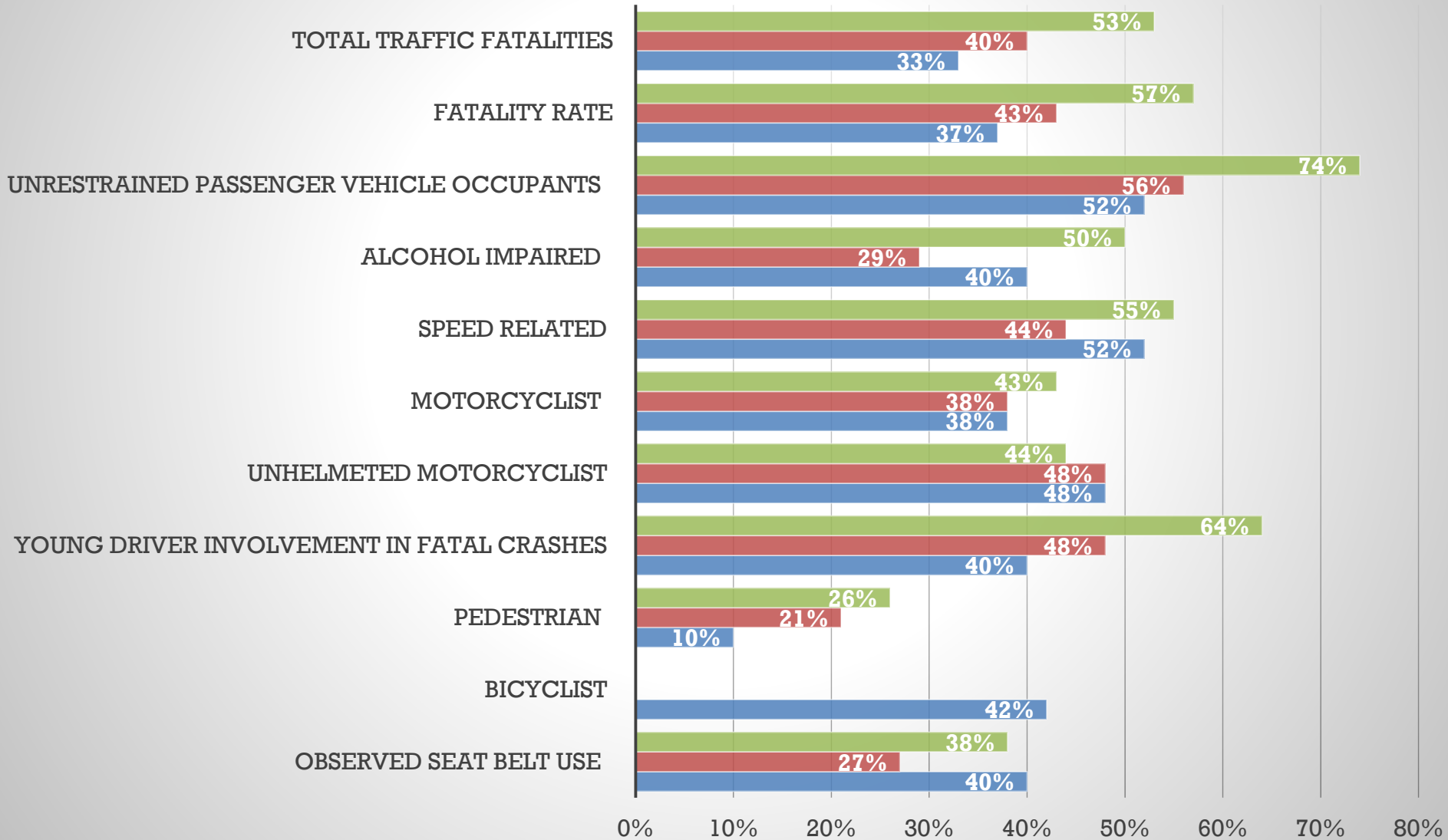
Reporting Progress

- States must provide a program-area-level report on their success in meeting performance targets in their HSPs and Annual Reports.
 - If a State has not met its performance targets, NHTSA's implementing regulation requires the State to describe how it will make adjustments meet future year performance targets.

Percentage Of States Achieving Total Fatality And Fatality Rate Targets, By Year



- Percentage of States Achieving 2013 Targets
- Percentage of States Achieving 2014 Targets
- Percentage of States Achieving 2015 Targets





State Highway Safety Office & State DOTs Identical Targets

NHTSA and FHWA collaborated to harmonize common performance measures (fatalities, fatality rate, and serious injuries) to ensure the highway safety community is provided uniform measures of progress.

- ✓ Performance targets for the three common performance measures be *identical* to the State DOT targets reported in the Highway Safety Improvement Program (HSIP) annual report, as coordinated through the SHSP.
 - State DOTs and SHSOs must coordinate on targets for common measures.
 - Coordination and collaboration increases likelihood of making progress to achieve common goals.



**MMUCC Model Minimum Uniform Crash
Criteria (MMUCC)
&
Serious Injury Reporting Requirements
(at the State level)**



MMUCC Model Minimum Uniform Crash Criteria (MMUCC):

<https://www.nhtsa.gov/about-mmucc>

- The Model Minimum Uniform Crash Criteria (MMUCC) Guideline, 5th Edition (2017), is a voluntary guideline designed to help States determine what crash data to collect on their police accident reports (PARs) and what data to code and carry in their crash databases.



Serious Injury Reporting:

<https://www.transportation.gov/government/traffic-records/serious-injury-reporting>

- The US DOT established a single, national definition for States to report serious injuries per the Model Minimum Uniform Crash Criteria (MMUCC) 4th Edition “*Suspected Serious Injury (A)*” attribute found in the “Injury Status” element.
 - States are required to comply with the new definition by April 15, 2019.
 - It is recommended that States begin using the MMUCC 4th Edition definition and attribute beginning January 2019 or earlier in order to have a complete and consistent crash data file for the entire 2019 calendar year.



Vision Zero

- NHTSA's implementing regulation requires that States demonstrate a linkage between their problem identification, targets, countermeasure strategies and funding allocation.
- Reaching zero deaths will be difficult, will take time and will require significant effort but it is the only acceptable goal.



References & Resources



CrashStats:

<https://crashstats.nhtsa.dot.gov/#/>

The screenshot shows the NHTSA CrashStats website. At the top, there is a navigation bar with the NHTSA logo, "CrashStats Home", and links for "FARS Data Tables", "Query FARS Data", "State Traffic Safety Info (STSI)", and "Help". A large grey box in the center contains a welcome message: "Welcome to NHTSA's National Center for Statistics and Analysis (NCSA) Motor Vehicle Traffic Crash Data Resource Page". Below this is a search bar with the placeholder text "Search publications by title, topic, document type or published year" and a "Search" button. There are also two buttons: "View By Topics" and "View By Document Types".

Below the search area, the section "Recent NCSA Publications" is displayed. A "Hide Associated Topics" button is located to the right. The publications are listed in a table with columns for DOT HS #, Year Published, Title, and Topics.

DOT HS #	Year Published	Title	Topics
812446	2017	Drowsy Driving 2015 Download	Drowsy Driving
812354	2017	Cost & Weight Added by the Federal Motor Vehicle Safety Standards for MY 1968-2012 Passenger Cars & LTVs Download	Regulatory Evaluations
812376	2017	2015 Summary of Motor Vehicle Crashes (Final Edition) Traffic Safety Fact Sheet Download	Fatal Crash Information Traffic Safety Facts Publications
812450	2017	2016 Alcohol-Impaired Driving Traffic Safety Fact Sheet Download	Alcohol/Alcohol-Impaired Driving
812456	2017	2016 Fatal Motor Vehicle Crashes: Overview Download	NEW Data Release Fatal Crash Information
812449	2017	2016 FARS/CRSS Coding and Validation Manual Download	Manuals and Documentation FARS/CRSS Combination Manuals



State Traffic Safety Information:

<https://cdan.nhtsa.gov/STSI.htm>

United States Department of Transportation



[Ratings](#) [Recalls](#) [Risky Driving](#) [Road Safety](#) [Equipment](#) [Technology & Innovation](#) [Search](#)

[Report a Problem](#)
[Research & Data](#)
[Laws & Regulations](#)
[Information For](#) ▼

[CrashStats](#) [FARS Data Tables](#) [Query FARS Data](#) [State Traffic Safety Info \(STSI\)](#) [Help](#)

Select on the map below to see a **State report** or [View USA Crash Location Map](#)



[View Native American Traffic Safety Facts](#)

STSI Reports Contain Additional Information From The Following Sources

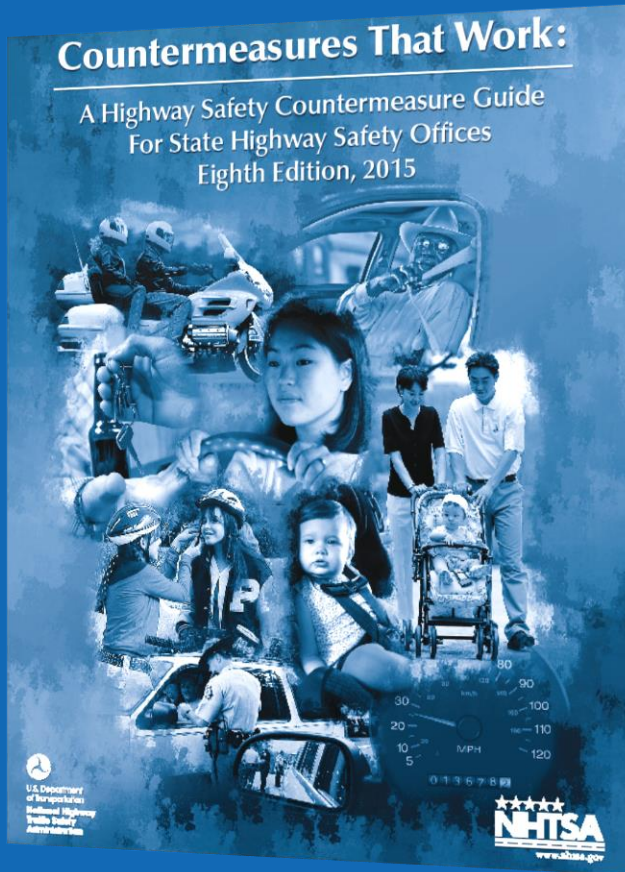
[Federal Highway Administration: Highway Statistics Series](#)

[United States Census Bureau: Population Data](#)



Countermeasures That Work

nhtsa.gov/staticfiles/nti/pdf/812202-CountermeasuresThatWork8th.pdf



Countermeasures That Work

Countermeasures to improve pedestrian safety are listed below and discussed individually in the remainder of this chapter. The table is intended to give a rough estimate of each countermeasure's effectiveness, use, cost, and time required for implementation. The symbols and terms used are described below. Effectiveness, cost, and time to implement can vary substantially from State to State and community to community. Costs for many countermeasures are difficult to measure, so the summary terms are very approximate. See each countermeasure discussion for more information on each item.

1. Preschool-age Children

Countermeasure	Effectiveness	Cost	Use	Time
1.1 Children's safety clubs	★ ★	Varies	Unknown	Unknown
1.2 Child supervision	★	\$	Unknown	Short

2. School-age Children

Countermeasure	Effectiveness	Cost	Use	Time
2.1 Elementary-age child pedestrian training	★ ★ ★	\$	Unknown	Short
2.2 Safe Routes to School (SRTS)	★ ★	\$	High	Short
2.3 Child school bus training	★ ★	\$	High	Short

3. Impaired Pedestrians

Countermeasure	Effectiveness	Cost	Use	Time
3.1 Communications and outreach	★ ★	Varies	Low	Medium
3.2 "Sweeper" patrols of impaired pedestrians	★	\$\$	Low	Medium

4. All Pedestrians

Countermeasure	Effectiveness	Cost	Use	Time
4.1 Pedestrian safety zones	★ ★ ★ ★	\$\$\$	Low	Medium
4.2 Reduce and enforce speed limits	★ ★ ★	\$	High	Varies
4.3 Conspicuity enhancement	★ ★ ★	\$	Low	Medium
4.4 Targeted enforcement	★ ★ ★	\$\$	Low	Short
4.5 Driver training	★	\$	Low	Medium
4.6 Pedestrian gap acceptance training	★	\$\$	Unknown	Medium
4.7 University educational campaign	★	\$	High	Medium

4.7 University educational campaign	★	\$	High	Medium
4.6 Pedestrian gap acceptance training	★	\$\$	Unknown	Medium
4.5 Driver training	★	\$	Low	Medium
4.4 Targeted enforcement	★ ★ ★	\$\$	Low	Short
4.3 Conspicuity enhancement	★ ★ ★	\$	Low	Medium



Traffic Records Resources & Technical Assistance

<https://www.nhtsa.gov/research-data/traffic-records>

- **Crash Data Improvement Program (CDIP)**
 - Examines the quality of a State's crash data and provides the State with specific recommendations to improve the quality, management and use of that data to support safety decisions.
- **GO Teams**
 - Provide resources and assistance to State traffic records professionals as they work to better their traffic records data collection, management, and analysis capabilities.
 - GO Teams are small groups of one to three subject matter experts designed to help States address traffic records issues.
- **MMUCC Mapping**

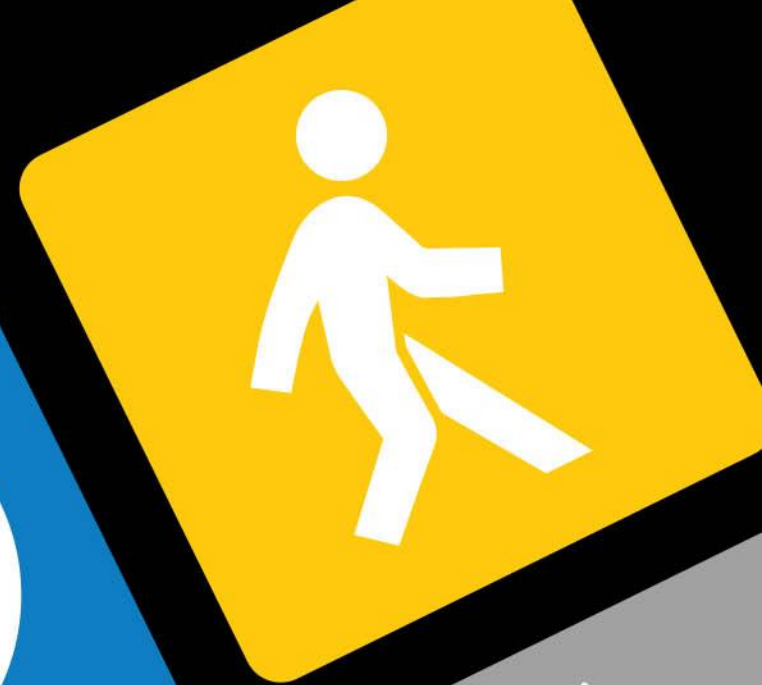
*These programs are free to States and made available on a first-come, first-served basis given available funds.



Why are Performance Measures Important?

- Augment State highway safety planning
- Direct resources to where most needed
- Connect targets to action
- Cultivate increased accountability and transparency
- Evaluate safety program progress
- Communicate priorities, results and the importance of traffic safety

NHTSA



THANK YOU.

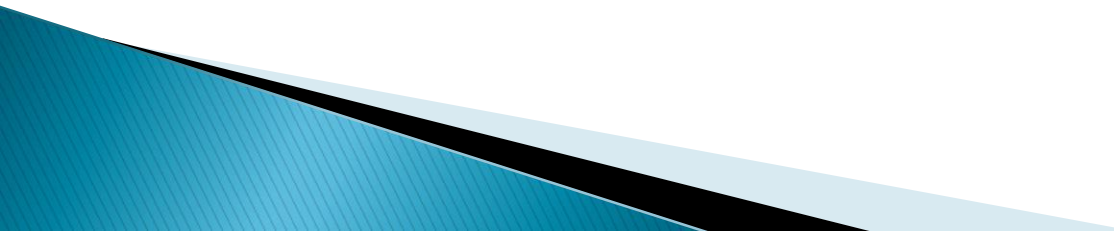


U.S. Department of Transportation
Federal Highway Administration

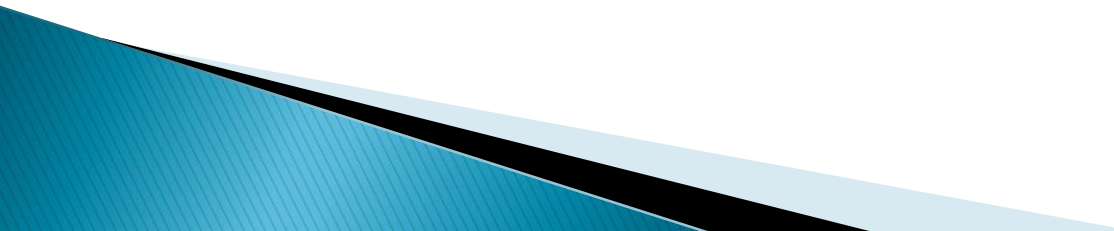
Safety Transportation Performance Management

Overview

Safety Performance Management

- Background
 - Safety Performance Measures
 - Non-motorized fatalities and serious injuries
- 

Transportation Performance Management (TPM)

- ▶ A key feature of MAP-21 is the establishment of a performance based Federal-aid highway program
 - ▶ Transportation performance management represents the opportunity to:
 - Prioritize needs
 - Align resources for optimizing system performance in a collaborative manner
- 

National Goals

- ▶ **Safety**
- ▶ Infrastructure condition
- ▶ Congestion reduction
- ▶ System reliability
- ▶ Freight movement and economic vitality
- ▶ Environmental sustainability
- ▶ Reduced project delivery delays



TPM Elements



Safety PM Measures

Requires DOTs to establish targets for:

1. Number of Fatalities
2. Rate of Fatalities (per 100M VMT)
3. Number of Serious Injuries
4. Rate of Serious Injuries (per 100M VMT)
5. Number of Non-Motorized Fatalities plus Serious Injuries



Non-motorized Performance Measure Will:

- ▶ Recognize that walking and biking are modes of transportation with unique crash countermeasures that differ from motor vehicles
- ▶ Address the increasing trend in the total number of pedestrian and bicyclist fatalities in the US



Non-motorized Performance Measure

The *Combined total number of Non-motorized Fatalities and Non-motorized Serious Injuries involving a motor vehicle during a calendar year*

- ▶ Data Sources Used by FHWA
 - Fatalities – FARS
 - Serious Injuries – State Motor Vehicle Crash Data Base




Serious Injuries – State Motor Vehicle Crash Databases

- ▶ 23 CFR §490.205 requires serious injuries to be coded by the KABCO injury scale as described in Model Minimum Uniform Crash Criteria (MMUCC) 4th Edition
- ▶ Serious injuries conversion table to be used to convert other scales to KABCO
- ▶ By April 15, 2019, serious injuries must be determined using the MMUCC 4th edition

KABCO Scale

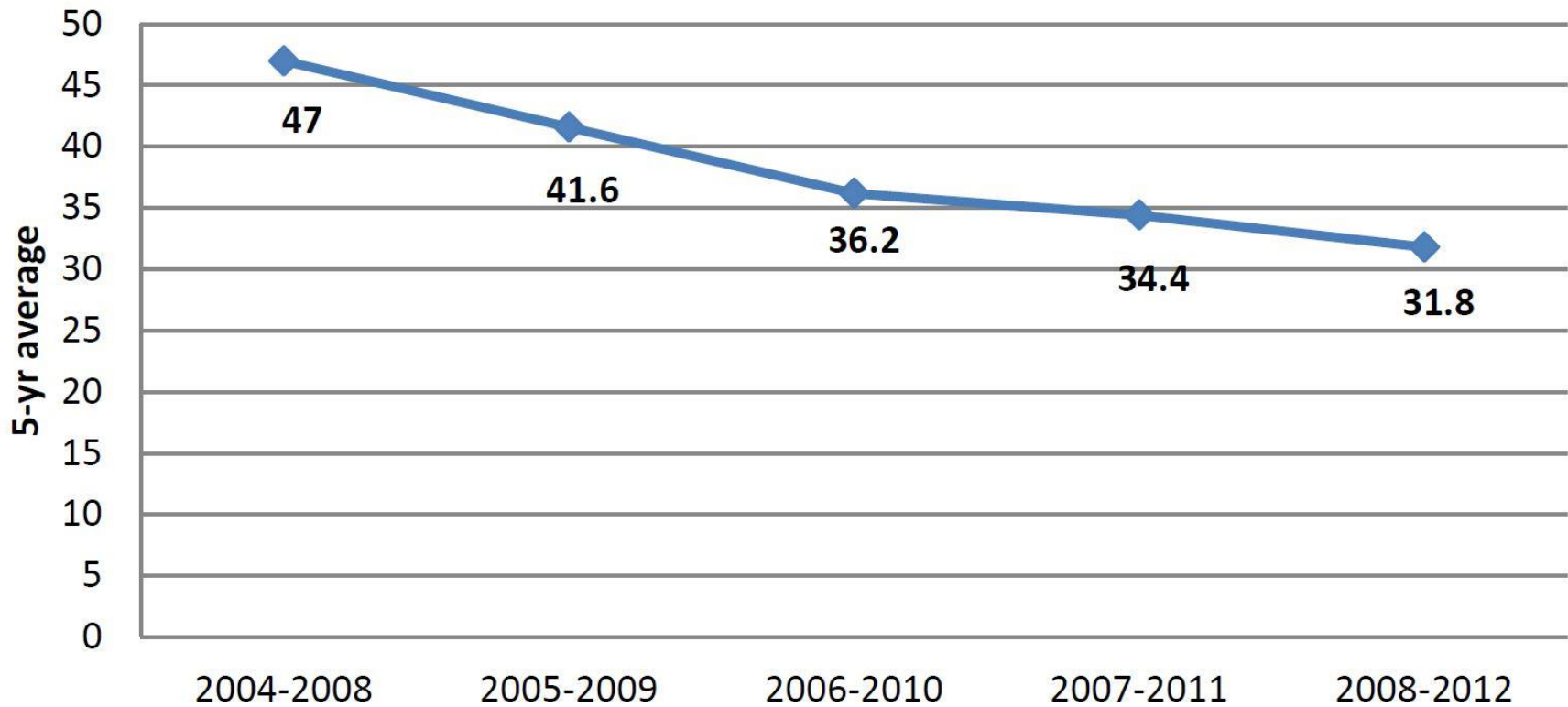
The coding convention system for injury classification established by the National Safety Council (23 CFR §490.205)



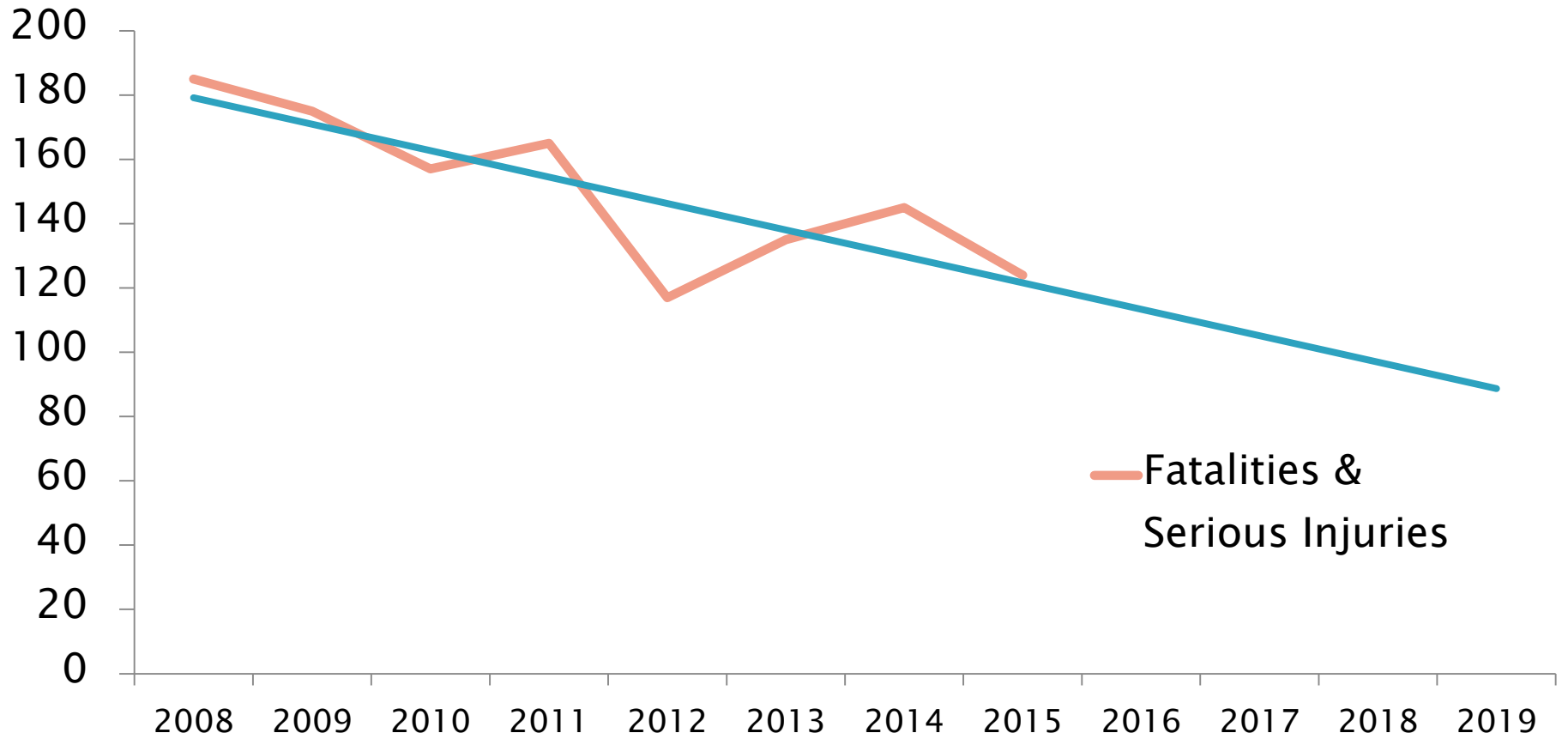
K	=	Fatal Injury
A	=	Suspected Serious Injury
B	=	Suspected Minor Injury
C	=	Possible Injury
O	=	No Apparent Injury

Trend Line Example

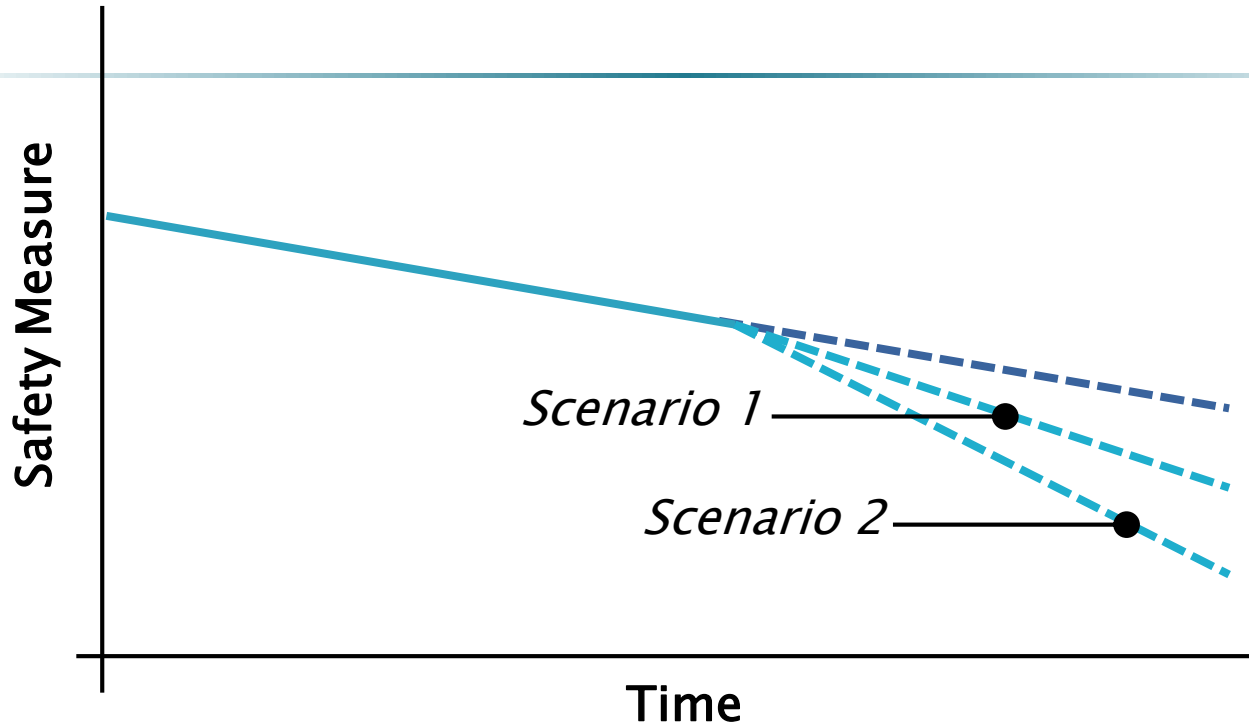
NM F+SI Five-Year Average



Trend Line Example



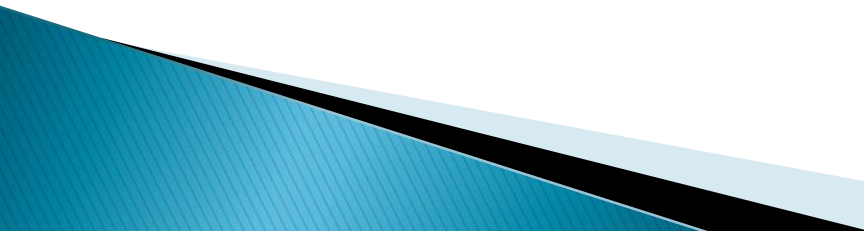
Goal: Performance based HSIP



What is the impact of improvements?

**Estimate target based on forecasted fatality
reduction from safety plans**

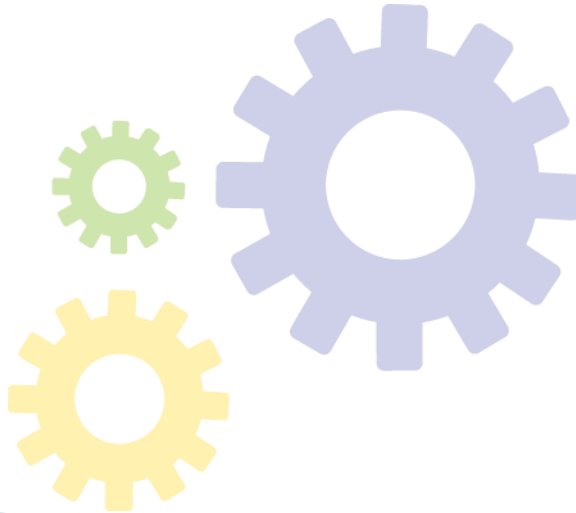
Adjust Target Using Countermeasure Impacts

- ▶ SafetyAnalyst
 - ▶ Interactive Highway Safety Design Model (IHSDM)
 - ▶ *HSIP Manual*
 - ▶ *Highway Safety Manual* (HSM)
 - ▶ Crash Modification Factors Clearinghouse (CMF Clearinghouse)
 - ▶ *Countermeasures That Work*
- 

MPO Safety PM Targets

MPOs may:

1. Adopt and apply the State DOT's targets to the MPO area, or
2. Develop their own targets for one or more performance measures.



MPO Safety Performance Measure Fact Sheet

https://safety.fhwa.dot.gov/hsip/spm/mpo_factsheet.cfm

If an MPO agrees to support a State HSIP target, the MPO would...	If an MPO establishes its own HSIP target, the MPO would...
<ul style="list-style-type: none">• Work with the State and safety stakeholders to address areas of concern for fatalities or serious injuries within the metropolitan planning area• Coordinate with the State and include the safety performance measures and the State's HSIP targets for those measures in the MTP (Metropolitan Transportation Plan)• Integrate into the metropolitan transportation planning process, the safety goals, objectives, performance measures and targets described in other State safety transportation plans and processes such as applicable portions of the HSIP, including the SHSP• Include a description in the TIP (Transportation Improvement Program) of the anticipated effect of the TIP toward achieving HSIP targets in the MTP, linking investment priorities in the TIP to those safety targets	<ul style="list-style-type: none">• Establish HSIP targets for all public roads in the metropolitan planning area in coordination with the State• Estimate vehicles miles traveled (VMT) for all public roads within the metropolitan planning area for rate targets• Coordinate with the State and include the safety performance measures and the MPO's safety targets for those measures in the MTP• Integrate into the metropolitan transportation planning process, the safety goals, objectives, performance measures and targets described in other State safety transportation plans and processes such as applicable portions of the HSIP, including the SHSP• Include a description in the TIP of the anticipated effect of the TIP toward achieving HSIP targets in the MTP, linking investment priorities in the TIP to those safety targets

Coordination Cycle for 2018 Targets

Target Setting Coordination

- By Spring, begin engaging DOT, SHSO, and MPO stakeholders
- Set targets for CY 2018

Target Approval

By June, secure CY 2018 target approval from DOT/SHSO leadership



2017

July 1

SHSO submits HSP to NHTSA including 3 identical safety targets

August 31

State DOT submits HSIP Annual Report to FHWA, including safety targets

2018

By February 27
MPOs establish safety targets

2019 - 2020

December 2019

Data available to evaluate targets

March 2020

States notified whether they met or made significant progress toward CY 2018 targets

FHWA Target Achievement Evaluation

A State DOT is determined to have met or made significant progress toward meeting its targets when at *least four* of the five established performance targets

a) are met

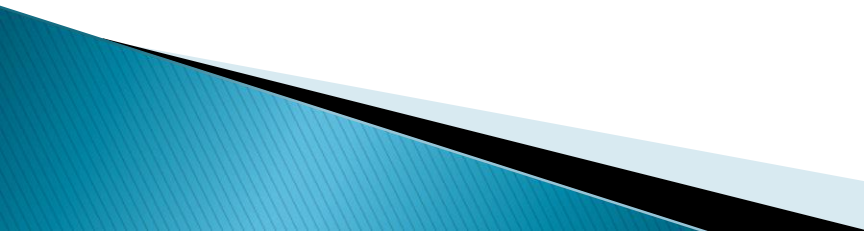
-- or --

b) Better than the baseline (five-year rolling average data for the performance measure up to the year prior to the establishment of the State's target)

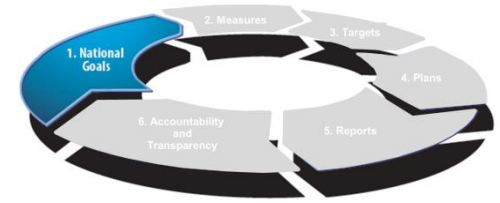
Target Achievement Evaluation

- ▶ If State did not meet or make significant progress toward meeting targets
 - Use obligation authority equal to the HSIP apportionment for the prior year only for highway safety improvement projects

and

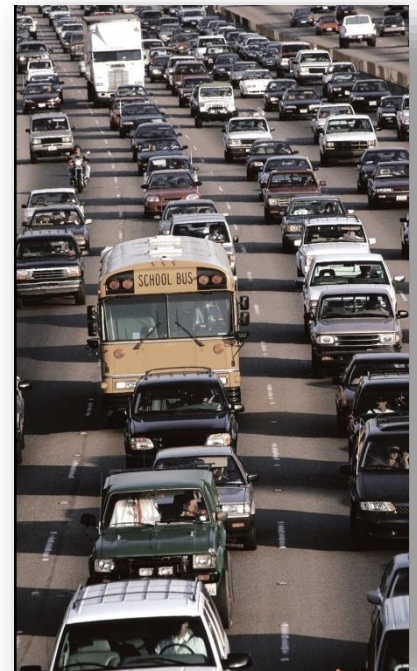
 - Submit a HSIP Implementation Plan
- 

Safety Performance Management



Performance Based Highway Safety Improvement Program (HSIP)

Goal: Achieve a significant reduction in fatalities and serious injuries on all public roads



For More Information

- ▶ Safety Performance Management

<http://safety.fhwa.dot.gov/hsip/spm/>

- ▶ Highway Safety Improvement Program

<http://safety.fhwa.dot.gov/hsip/>

Discussion

⇒ Send us your questions



⇒ Follow up with us:

⇒ Amy Schick amy.schick@dot.gov

⇒ Dave Kopacz david.kopacz@dot.gov

⇒ General Inquiries pbic@pedbikeinfo.org

⇒ Archive at www.pedbikeinfo.org/webinars

