



Safety Priority Statement Vulnerable Road Users

Proposed Position: Transportation policy supports safe accommodation of all road users.

Potential Lives Saved: about 11,000 vulnerable road users (VRU) fatalities per year among people walking, bicycling, and using motorcycles.

Current Situation: Vulnerable road user fatalities have been increasing in the U.S. at an alarming rate outpacing those of vehicle occupants. Since 2009 pedestrian and bicyclist fatalities have risen 40%. In 2017, there were 5,977 pedestrian fatalities, a 1.7% decrease from 2016, accounting for 16% of all traffic fatalities.¹ Motorcyclist fatalities exhibit a similar trend, with 5,172 motorcyclist fatalities in 2017, a 3% decrease from 2016.² Bicyclist fatalities, while they make up a smaller proportion of all traffic fatalities, exhibit these trends as well with 783 bicyclist fatalities in 2017, an 8% decrease from 2016.³ Most fatal pedestrian and bicyclist crashes occur on major urban/suburban streets (arterials and collectors), a relatively small part of the US traffic system as a whole. While these trends are found across urban, suburban, and rural conditions, the relative safety of the *most* urban conditions and the relatively higher risk presented by late-20th-century road development indicates that the key to reversing this trend will be to make urban and suburban roads more like traditional streets, with quality sidewalks, very frequent opportunities to cross streets, and dedicated bike infrastructure. Several major cities have made significant progress in reducing pedestrian risk in particular: cities that stand out include Seattle, New York, and San Francisco, all of which were already among the safest cities in the U.S.

Opportunity: If the U.S. is able to eliminate crashes between vehicles and VRUs, over 11,000 lives could be saved each year. The VRU safety problem is multifaceted, but focusing on a safe systems approach as outlined in the Road to Zero coalition report provides the opportunity to reduce conflicts and the risk of a crash *and* reduce the energy transferred in a crash. Eliminating VRU fatalities and serious injuries will require a variety of strategies moving forward. Strategies that can be deployed in urban and suburban areas, and especially on and near major urban/suburban streets, are likely to be most effective since these are areas of high conflict between drivers and people outside vehicles. Reducing motor vehicle speed in urban and suburban areas has been proven effective at both reducing the number and severity of vehicle-VRU crashes; if a car traveling at 40 mph strikes a pedestrian, the fatality rate for the pedestrian is 50%, but if that same collision occurs at 25 mph, the pedestrian fatality rate decreases drastically to 10%.⁴ More universally, the use of helmets for motorcyclists and cyclists of all ages has the potential to reduce injury severity in the event of a collision. For motorcyclists and cyclists, the risk of head

¹ NHTSA: [Pedestrians 2017](#)

² NHTSA: [Motorcycles 2017](#)

³ NHTSA: [Bicyclists and Other Cyclists 2017](#)

⁴ Tefft, B. C. (2012, August 27). Impact speed and a pedestrian's risk of severe injury or death.

injury in the event of a crash decreases by 69% and 60%, respectively, with helmet use.^{5,6} Expansion of dedicated walking and bicycling infrastructure, as well as comprehensive design and management of roadways to align speeds with survivability, are priorities in order to reduce VRU fatalities and serious injuries.

Background: VRU is a term applied to those most at risk in traffic; mainly those unprotected by an outside shield, or vehicle body, and associated safety systems, such as airbags and seatbelts. In the U.S. and abroad, VRUs are predominantly pedestrians, motorcyclists, and pedalcyclists (bicyclists). Although exposure data for VRUs in the U.S. is lacking, the rapid observed increase in overall proportion of traffic fatalities they make up reflects potentially increased risk per user as well as increased risk per resident. Implementation of aggressive and innovative policies and solutions to protect VRUs are needed on the road to zero traffic fatalities.

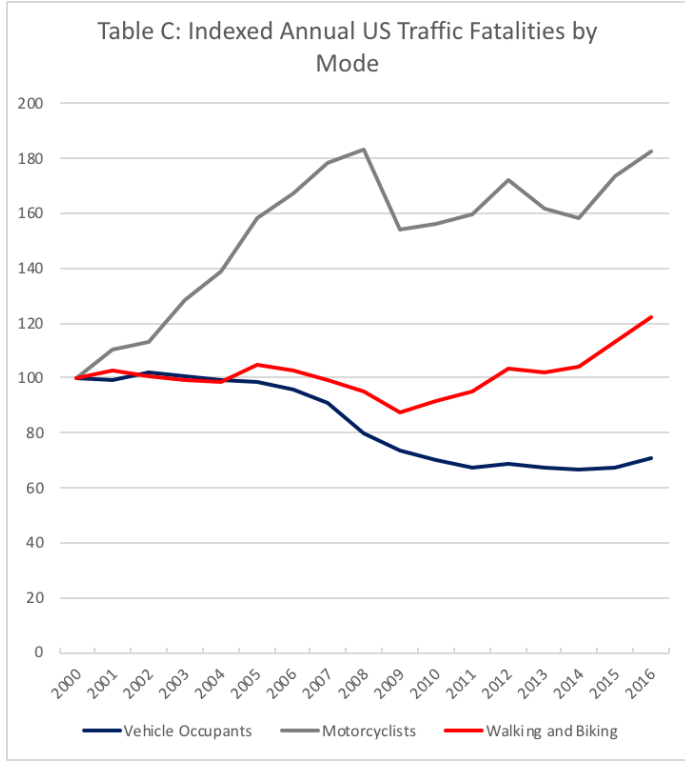
Supporters of Road to Zero Coalition Priority Statement on Vulnerable Road Users

Organization	Organization URL

Safety Priority Statement Vulnerable Road Users

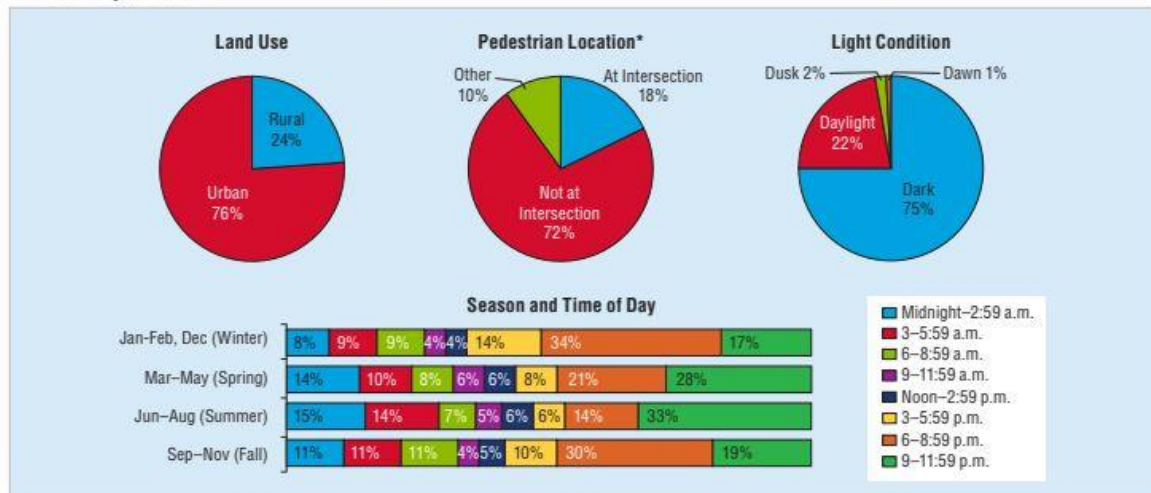
Federal Sources of Data with Links

- [NHTSA FARS + Traffic Safety Facts 2016](#)



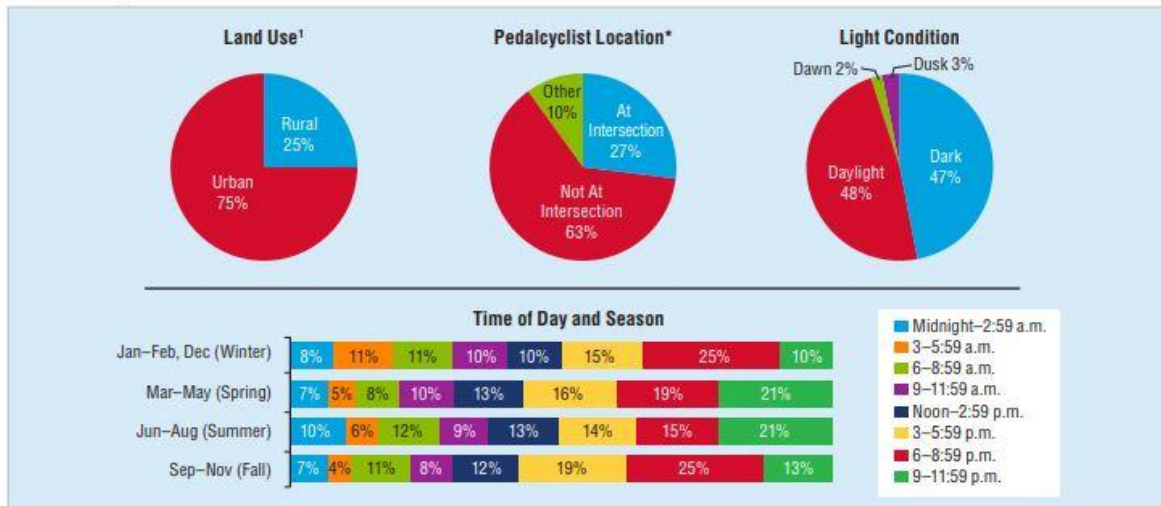
- [NHTSA: Pedestrians](#)

Percentage of Pedestrian Fatalities in Relation to Land Use, Pedestrian Location, and Light Condition, and Season and Time of Day, 2016



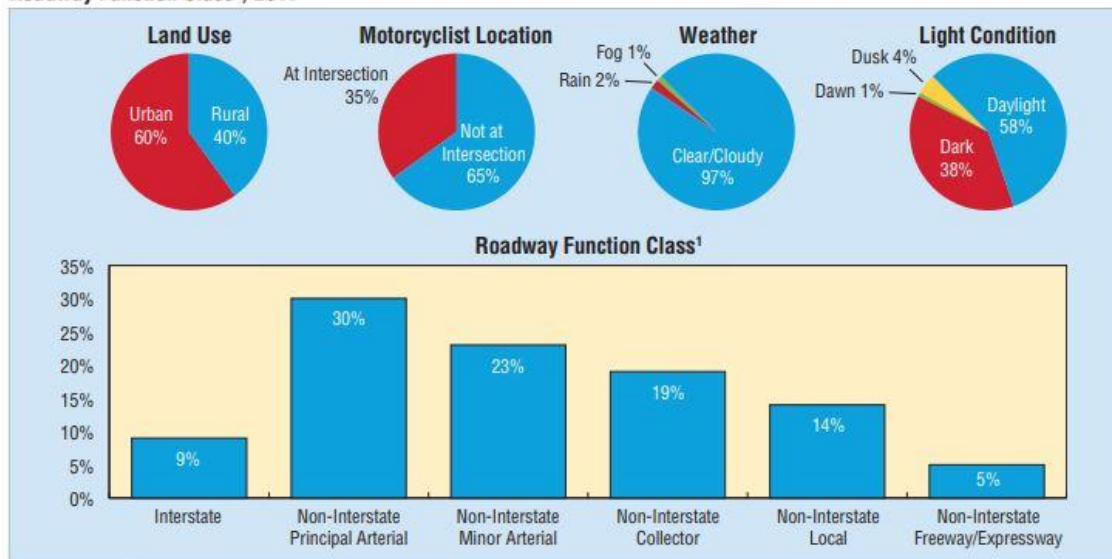
- [NHTSA: Pedalcyclists](#)

Percentage of Pedalcyclist Fatalities in Relation to Land Use¹, Pedalcyclist Location, Light Condition, and Time of Day and Season, 2017



- NHTSA: Motorcyclists

Motorcycle Traffic Fatalities, by Land Use, Motorcyclist Location, Weather, Light Condition, and Roadway Function Class¹, 2017



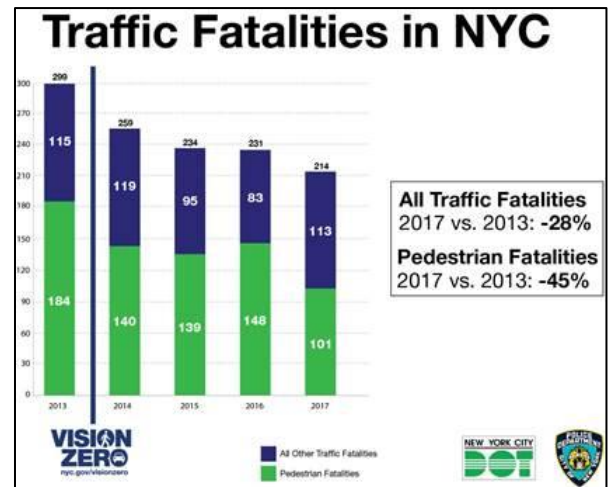
The following strategies are being pursued by selected members of the Coalition:

Strategy #1: Advance VRU Protection Legislation at the State Level

Goal #1: Enact and/or Strengthen Speed Mitigation Policies, esp. in Urban and Suburban Areas

Current Situation: Speed increases both crash risk and severity, therefore playing a crucial role in roadway safety. If a car traveling at 25 mph strikes a pedestrian, the fatality rate for the pedestrian is approximately 10%. If that same collision were to occur at 40 mph, the fatality risk increases to 50%.⁷

Opportunity: Speed mitigation policies benefit all VRUs. These efforts may include setting speed limits using a safe systems approach,⁸ stronger speed limit enforcement, and infrastructure measures such as roundabouts speed humps and other measures.⁹ Urban and suburban areas, in which pedestrian and cycling traffic is usually higher, especially benefit from lowering the speed limit, which does not require new infrastructure. Even modest speed reductions could prevent many collisions and reduce the severity of injuries to VRUs.^{10,11,12} New York City, Seattle, and San Francisco have all been successful in reducing pedestrian fatalities in distinctly different urban environments. In New York, pedestrian fatalities fell to the lowest level in a century after the city adopted 25 mph default speeds and implemented automated speed enforcement in 2013 and 2014 as part of its Pedestrian Safety Plan and subsequent Vision Zero plan;¹³ pedestrian fatalities have fallen 45% since 2013.



Member Actions: The Road to Zero Coalition members should encourage states to evaluate current speed policies and make changes where appropriate to increase VRU protection, especially on urban and suburban roads.

Resources:

[Impact Speed and a Pedestrian's Risk of Severe Injury or Death](#)

[NYC Vision Zero Report](#)

[The Impact of Speed and Other Variables on Pedestrian Safety in Maine](#)

[Review of Traffic Engineering Measures Designed to Reduce Pedestrian-Motor Vehicle Crashes](#)

[Literature Review on Vehicle Travel Speeds and Pedestrian Injuries](#)

⁷ Tefft, B. C. (2012, August 27). Impact speed and a pedestrian's risk of severe injury or death.

⁸ Towards Zero Foundation: [What is the safe system?](#)

⁹ Retting, R. A., Ferguson, S. A., & McCartt, A. T. (2003, September). A review of evidence-based traffic engineering measures designed to reduce pedestrian-motor vehicle crashes.

¹⁰ W.A. Leaf and D.F. Preusser (1998), Literature Review on Vehicle Travel Speeds and Pedestrian Injuries, National Highway Traffic Safety Administration, USDOT

¹¹ Jack Stuster and Coffman, Zail (1998), Synthesis of Safety Research Related to Speed and Speed Limits, FHWA-RD-98-154 Federal Highway Administration

¹² Per E. Gårder (2004), "The Impact of Speed and Other Variables on Pedestrian Safety in Maine," *Accident Analysis & Prevention*, Volume 36, Issue 4, July, pp. 533-542

¹³ Fitzsimmons, E. (2015). New York City's Pedestrian Fatalities Lowest on Record in 2014. The New York Times.

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Strategy #1: Advance VRU Protection Legislation at the State Level

Goal #2: Enact Universal Helmet Laws for All Motorcyclists and Pedalcyclists

Current Situation: Helmets play a critical safety role for motorcyclists and pedalcyclists. Motorcycle and cyclist helmet laws vary widely among the states. Universal motorcycle helmet laws, which require all persons to wear a helmet, are currently in place in 19 states and D.C.¹⁴ Laws requiring only some motorcyclists to wear a helmet – usually determined by a combination of operator age, permit/license type, and insurance coverage – are in place in 28 states. The remaining three states, Illinois, Iowa, and New Hampshire, have no motorcycle helmet laws. No state law requires adults to wear bicycle helmets.¹⁵ In 21 states and D.C., young bicycle riders (anywhere from 11-17 and younger) are required to wear a helmet.

Opportunity: Multiple studies have proven that the most effective personal protection for motorcyclists and pedalcyclists is the helmet. Evidence from systematic reviews shows that wearing a helmet reduces the risk of a motorcyclist sustaining a fatal injury by 42% and the risk of sustaining any head injury by 69%.¹⁶ Helmet benefits to cyclists are similar, with the risk of head injury decreasing by 60% given helmet use.¹⁷ Numerous studies have looked at motorcycle crashes and associated injury outcomes before and after helmet law establishment or reenactment. While findings are somewhat mixed, a majority of results support the case for motorcycle helmet laws from a safety perspective, showing significant reductions in the relative risk of fatality after helmet laws are put in place.^{18,19,20,21,22} Research on the efficacy of cycling helmet laws in the U.S. is lacking, but there is some evidence to date that there have been fewer fatalities among youth in states with cycling helmet laws for young riders.²³

Member Actions: The Road to Zero Coalition members should

- Encourage states to issue universal helmet laws for all motorcyclists
- Encourage states to issue no-penalty youth helmet requirements for bicyclists under 14 and pedalcyclists.

Resources:

IIHS: [Motorcycle and Bicycle Helmet Use Laws](#)

Helmets for Preventing Injury in [Motorcycle Riders](#) and [Cyclists](#)

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Strategy #2: Advance VRU Protection Legislation at All Levels

Goal #3: Promote Infrastructure and Roadway Improvements to Increase VRU Protection

Current Situation: Historically, roadway system design has given minimal consideration to VRUs. As a result, sharing the road safely with VRUs has become difficult. This is especially true in urban areas where the increased density of motorists and VRUs creates a greater incidence of interaction between the two groups. Although infrastructure and roadway improvements may be expensive, they can be strategically chosen and placed in high vehicle-VRU conflict areas, increasing cost effectiveness.²⁴ Further, infrastructure improvements may be particularly attractive to municipalities over other methods of VRU protection because benefits do not require repeated enforcement or any initiative or active participation by the VRU.

Opportunity: Efforts towards a more forgiving roadway and surrounding infrastructure are an integral part of a safe systems approach to traffic safety and have the ability to decrease risk to VRUs. Access, safety, and convenience are related issues for people walking and bicycling: a pedestrian network characterized by long distances between safe crosswalks, long waits at signals, or broken sidewalks will result in unsafe movements – because the safety-mobility tradeoff is too extreme.

Across environments – downtowns and central-city neighborhoods, the general-urban environment, and the car-oriented or conventional suburban environment – pedestrians need quality sidewalks and a coherent walking network.

For pedestrians, sidewalks and refuge islands can protect from collisions with motor vehicles.²⁵ On-road bikeways, such as separated/protected bike lanes, buffered bike lanes, and marked bike lanes, as well as off-road bike paths provide the lowest risk for cyclists.²⁶ While motorcyclists must share the roadway with motorists, roadside infrastructure changes, such as the modification of guardrail to be more motorcycle-friendly, can significantly reduce risk in the event of a crash.²⁷

Member Actions: The Road to Zero Coalition members should encourage both federal and state governments to incentivize and prioritize infrastructure projects that will result in a safer environment for VRUs.

Resources:

[Review of Traffic Engineering Measures Designed to Reduce Pedestrian-Motor Vehicle Crashes](#)

[Impact of Transportation Infrastructure on Bicycling Injuries and Crashes](#)

[Less-sharp Guardrails Can Save Motorcyclists](#)

²⁴ Smart Growth America, [Complete Streets: Guide to Answering the Costs Question](#)

²⁵ Retting RA, Ferguson SA, McCartt AT. A review of evidence-based traffic engineering measures designed to reduce pedestrian-motor vehicle crashes. *Am J Public Health.* 2003;93:1456–1463

²⁶ Reynolds CC, Harris MA, Teschke K, Crompton PA, Winters M. The impact of transportation infrastructure on bicycling injuries and crashes: a review of the literature. *Environ Health.* 2009;8:47

²⁷ [Less-sharp Guardrails Can Save Motorcyclists.](#) (2015, September 14)

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Strategy #2: Advance VRU Protection Legislation at All Levels

Goal #4: Promote Revision of Design Process & Adoption of Updated Design Guidance for Streets

Current Situation: While FHWA/USDOT and leading states have taken important steps to update rules on American streets and roads to allow the implementation of quality walking and bicycling infrastructure, many states still use a variety of procedures and design manuals that were developed primarily for highway environments, and that stymie the creation of safe streets.

The design process in most states uses a design standard/design exception process for streets and non-freeway roads, even though these processes are only required by FHWA on Interstate freeways and other high-speed (50 mph+) roads. This process, combined with older design standards, can easily be used to prevent sidewalk or bikeway construction, and usually requires additional work for VRU-protective infrastructure than for non-protective infrastructure. This higher burden of proof, usually through design exceptions and related requirements, reduces the pace at which VRU infrastructure can be improved, costing lives. While there are many ways for states to enable safer designs for VRUs, either standard or processes and practices will need to be updated in most states if VRUs are to have a level playing field in the design process.

Opportunity: An FHWA rule change in 2016 removed the requirement that NHS routes follow a set of design criteria, such as 12' lanes, that now apply *only* to freeways and other 50+ mph roads. States can revise their design manuals to start at 10' for lower-speed (under 50 mph) roads and streets, support urban street furnishing zones, and protected bike lanes along streets and roads regardless of state or municipal ownership and regardless of NHS arterial/collector/local classification.

Member Actions: Members should:

- Call upon states, counties, and municipalities to revise their design manuals and processes to place complete streets on a default footing in the design process, rather than as exceptions. Washington State DOT (WSDOT) has adopted a model design manual that can be applied at the state level.²⁸
- Call upon states, municipalities, and counties to adopt street-specific design guidance. Examples include the National Association of City Transportation Officials' *Urban Street Design Guide* and the ITE Recommend Practice on *Designing Walkable Urban Thoroughfares: A Context-Sensitive Approach*.^{29, 30}
- Update design guidance under their own purview to promote current best practices in street design, including VRU-safe lane width design, VRU-friendly low-speed turn and corner radii, and prioritization of reducing KSI (people killed or severely injured) in the design process.

Resources:

Washington State DOT – Design Manual

NACTO – Urban Street Design Guide

ITE – Designing Walkable Urban Thoroughfares: A Context Sensitive Approach

²⁸ Washington State DOT – Design Manual

²⁹ NACTO – Urban Street Design Guide

³⁰ ITE – Designing Walkable Urban Thoroughfares: A Context Sensitive Approach