CHAPTER 1

# Introduction

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# 1.1 TRANSPORTATION SAFETY: A CALL TO ACTION

Washington's streets and roads connect us to one another. They connect us to jobs, education, goods and services, and opportunity. Risking death and serious injury while simply trying to complete these daily tasks is unacceptable. We need to do more than imagine a world with zero fatalities and serious injuries involving motor vehicles. We need a plan, and we need to implement this plan. The public roadways we use need to be more than efficient and convenient. They also need to be safe and accessible to everyone, whether they travel on foot or on wheels.

All public roadways should offer ways for people to travel safely along or across them using a variety of modes. This requires extra care and attention to protect our most vulnerable road users.

We should all arrive at our destinations safe and unharmed, every time.

In Washington, 810 people died and 3,413 people were seriously injured in crashes involving motor vehicles in 2023. This represents an 85% increase since 2013 in fatalities and a 78% increase for serious injuries. On average, someone suffers a serious injury in Washington every 2.6 hours, and each day two people are killed in traffic crashes.

The individuals in these crashes are parents, children, teachers, students, coworkers, friends, and neighbors. The effects of roadway tragedies are widespread and far-reaching; the toll is both emotional and economic.

**WASHINGTON STATE FATALITIES, 1968–2023**

*SOURCE: WTSC HISTORICAL COUNTS, CFC FILES*

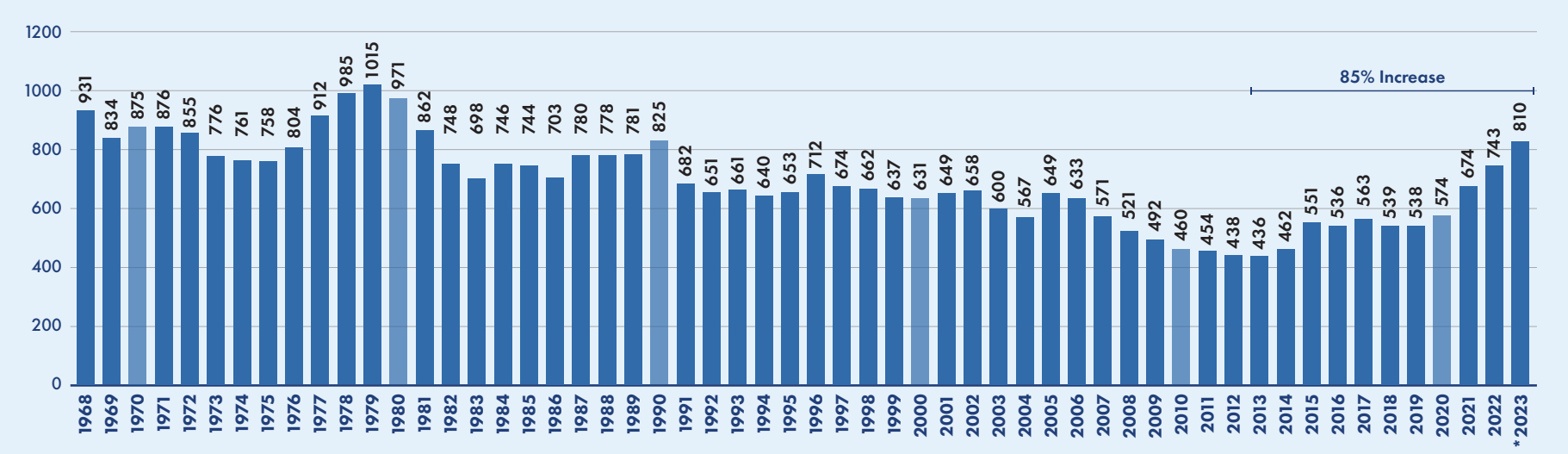



**FIGURE 1.** WASHINGTON STATE TRAFFIC FATALITIES, 1968-2023

**2023 data is an unofficial estimate, incomplete, subject to change.*

Beyond the savings in human lives, safety is an investment. Safer roads and safer communities can save billions of dollars. The societal financial cost of motor vehicle crashes in Washington for 2022 is estimated to be $20.48 billion,[1] which is 3.2% of the real gross domestic product (GDP) of the state[2] and represents $2,600 per person in Washington.[3]

These recent increases in fatalities and serious injuries are tragic. Creating a safer transportation system will require a serious commitment from all safety partners. Policy makers provide the rules, tools, and resources. Transportation professionals need to change how projects are selected, funded, and implemented. Educators help develop safe road users, and first responders prevent the worst outcomes when crashes occur. The public can assist by encouraging policy makers to commit the funding and resources to achieve our shared safety goals and by promoting a prosocial safety culture in our communities.

In 2022, Finland saw zero traffic deaths in two-thirds of its municipalities, and they saw their traffic deaths fall to an 80-year low in 2023. This rests on the foundation of a prosocial traffic safety culture and a national commitment to achieve zero deaths and serious injuries. Washington State has been an early leader and partner in the growing national movement for safer roads. Through efforts by government agencies, safety partners, businesses, and the public, a renewed interest and resolve to address roadway safety is growing. This momentum is also seen at the national level. In 2022 the U.S. Department of Transportation developed the first-ever National Roadway Safety Strategy, and in 2023 the American Association of State Highway and Transportation Officials (AASHTO) held a national Safety Summit. We can leverage the national strategy and summit actions, along with our Target Zero Plan, to save lives. This vision must become a reality for every person who lives, works, plays, and travels in Washington.

1 WSDOT analysis using FHWA method for estimating crash cost for highway safety analysis

2 Bureau of Economic Analysis, GDP by State.

3 WA Office of Financial Management, Total population and percent change website.

## What is Target Zero?

Target Zero represents Washington's goal of eliminating fatalities and serious injuries on all public roadways by all road users by 2030. However, it represents more than just a number to be reached. It is our collective commitment to the shared goal and to creating a transportation system built around safety for every mode and every user. To follow through on this commitment, we must seize the opportunity to reduce the potential for future crashes, so we never have roadway deaths and serious injuries again. To improvise from President Kennedy, our goal is zero, not because it is easy, but because it is hard. And it is the only morally acceptable goal.

In 2000, Washington developed the first Target Zero Plan in the U.S., establishing the goal of zero fatalities and serious injuries. At the time, 2030 was an aspirational timeline for this vision. While data has continued to show an increase in fatalities and serious injuries over the past decade, maintaining the original goal of zero by 2030 is important because zero is the only acceptable traffic safety outcome. While challenging, we know it is possible to improve for several reasons:

- We've made meaningful progress before. From 2005 to 2013, Washington's fatalities reduced by 32%.
- Countries outside the U.S. currently experience traffic fatality rates per population that are less than half our rates in Washington. Within these countries, some cities have experienced zero fatalities.
- Of the 327 incorporated cities and unincorporated county areas in Washington, 148 achieved zero fatal crashes over the five-year period of 2019-2023.[1]

This is the seventh version of the Target Zero Plan. As we near 2030, we must act boldly and urgently to continuously improve the way we design, operate, and maintain the transportation system and educate our road users. It has taken decades to build the system we have inherited, so we must act to achieve and maintain zero fatalities and serious injuries. This updated plan lays out new, challenging initiatives, and a new way of thinking about transportation safety as part of a larger system. Thank you for joining us on this journey.

**Local Safety Planning in Washington.** While the Target Zero Plan provides inspiration and guidance for statewide roadway safety improvement, much of the day-to-day work of safety occurs at the regional, Tribal, and local levels. While state routes account for 7,000 centerline miles (9% of all public roads), city and county facilities account for more than 56,000 miles (72%), making safety on all public roads vital to achieving statewide goals.

More than 100 entities in Washington—local agencies, regional agencies, and Tribal nations—have developed or are developing Local Road Safety Plans, Vision Zero Plans, and Comprehensive Safety Action Plans with the same vision to eliminate fatalities and serious injuries on Tribal roads, city streets, and county roads.

1 Washington Traffic Safety Commission, 2024

# 1.2 SYSTEMS THINKING

Our surface transportation system is comprised of many parts, such as road users, vehicles, transportation infrastructure (roads, sidewalks, paths, intersections, etc.), transportation agencies, funding structures, policies, and laws. These different parts interact and, in combination, can create the potential for fatal and serious injury crashes. Washington's traffic safety leaders recognize that safety requires systems thinking, which allows us to understand and continuously improve the system elements and how they interact with each other to reach desired goals.

Crashes (observable events) are relatively random and rare outcomes. Crashes can occur for numerous reasons. Looking only at individual crashes presents a limited understanding of the system's operation and the reasons that crashes occur, as **Figure 2** shows.[1] Systems thinking tries to understand the trends and patterns that lead to these events (e.g., run off road crashes in a curve), and also the influence of underlying structures on those patterns (e.g., driver speeds, sharp curve after a long, straight highway). Finally, we need to understand and change the mental models of the partners responsible for the parts of the system that are interacting to produce undesirable traffic safety outcomes. For example, one organization or agency might believe that free flow speed is the most important aspect of roadway travel. That organization's decisions might compromise safety.

Reaching the goal of eliminating fatalities and serious injuries from our roadways requires transportation professionals and partners to think deeply and broadly across disciplines and jurisdictional boundaries. In addition to understanding the interplay of transportation system elements, we also need to consider how other societal systems (e.g., land use and development, social services, health policy, etc.) influence transportation and contribute to the likelihood and severity of crashes.

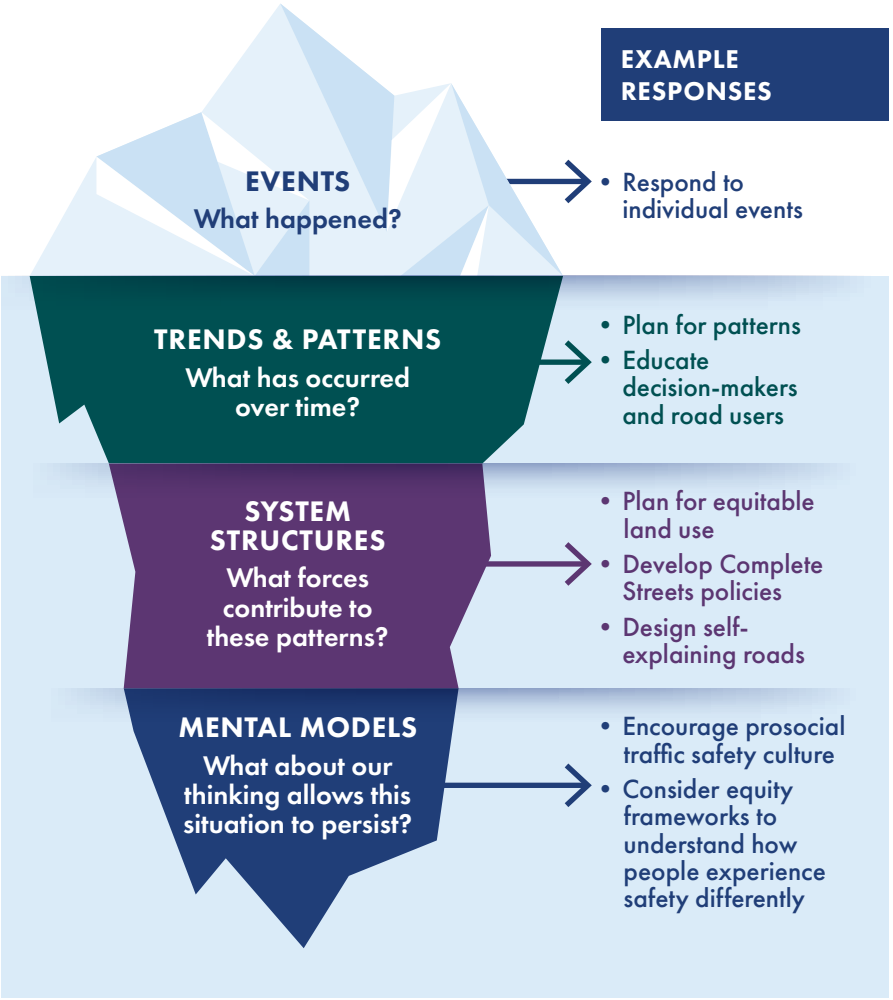



**FIGURE 2.** SYSTEMS THINKING LEVELS OF CURRENT CONDITIONS

1 Adapted from the iceberg model. https://mutomorro.com/iceberg-model/

## Road Safety Performance Metrics

Crashes occur for many different reasons. These contributing factors are often related to errors or failures within the system. In the past, we often discussed safety without defining it; this led to different people not talking about the same thing. To discuss safety consistently now, descriptions of three key road safety performance metrics—exposure, likelihood, and severity—must be understood.

- **Exposure.** The number of people interacting with the transportation system, in what mode, and for how long affects safety. Increases in motor vehicle miles traveled and miles traveled by walking, rolling, and cycling mean more people are on the system. In addition, crossing widths, time and distance for active transportation, length of road segment, intersection size, and conflict points increase the potential for crashes to occur.
- **Likelihood.** Many roadway system aspects (e.g., intersection design, roadway geometry, signal timing, lane striping) and vehicle design (e.g., vision-obstructing pillars, maneuverability, safety devices) can affect the likelihood of a crash occurring. Similarly, road users who are distracted, impaired, speeding, or engaging in other high risk behaviors also increase the likelihood of causing or being involved in a crash.
- **Severity.** Vehicle speeds, crash angles, differences in size and weight among the units involved, and lack of safety equipment use are the primary factors in crash severity. Other influences on severity include lack of protection from crash forces (e.g., occupants not wearing seat belts, pedestrians struck by a driver), physical health of road users involved in a crash, and the availability and responsiveness of post-crash care.

Applying these concepts can help us to recognize how our laws, policies, programs, projects, and strategies influence the system. To arrive at strategies that will prove effective for all people in Washington, we must include the assessment of safety performance in a multimodal and community-based context. Changes in one mode of travel may positively or negatively influence other modes. For example, multimodal assessment recognizes that changes for the safety of people in vehicles may result in negative effects to people walking or rolling, whereas improvements for pedestrians can result in safety improvements for people using all modes, including drivers.

# 1.3 PROSOCIAL TRAFFIC SAFETY CULTURE

"The roadway transportation system is a shared community that consists of various users including drivers, motorcyclists, passengers, cyclists, pedestrians, and others. This system is designed, maintained, and managed by various stakeholders including departments of transportation, transportation engineers, maintenance districts, city and county and Tribal road departments, elected officials, policy makers, law enforcement officers, traffic safety leaders... and others. Each of us is a member of the roadway transportation community because we depend on this shared system to connect us with people, places, goods, and services. For this system to meet everyone's needs and be sustained, we have an obligation to one another to act in ways that support the system."

*—Center for Health and Safety Culture, Montana State University, Proactive Traffic Safety*

Traffic safety culture refers to our shared belief system about our individual actions that affect safety.

Prosocial traffic safety culture goes further, referring to shared beliefs about our responsibility for collective actions that create a safe transportation system for everyone. Joint responsibility and collective actions involve two important parts:

- Road operators and partners who are responsible for planning, developing, operating, and maintaining a safe system.
- Road users who act to ensure the safety of themselves and the safety of the other members of the community using the transportation system.

Prosocial traffic safety behaviors are part of our positive daily choices. These actions are motivated by a shared identity and social bonds with a group. Sometimes culture is influenced by public policy.

To foster these prosocial traffic safety behaviors, we must create a traffic safety culture that encourages these behaviors and a social environment that rewards them. Recent data shown in **Figure 3** suggests that many people in Washington are already comfortable taking actions to help others be safer. This suggests that strategies to grow prosocial traffic safety behaviors may be effective in Washington.

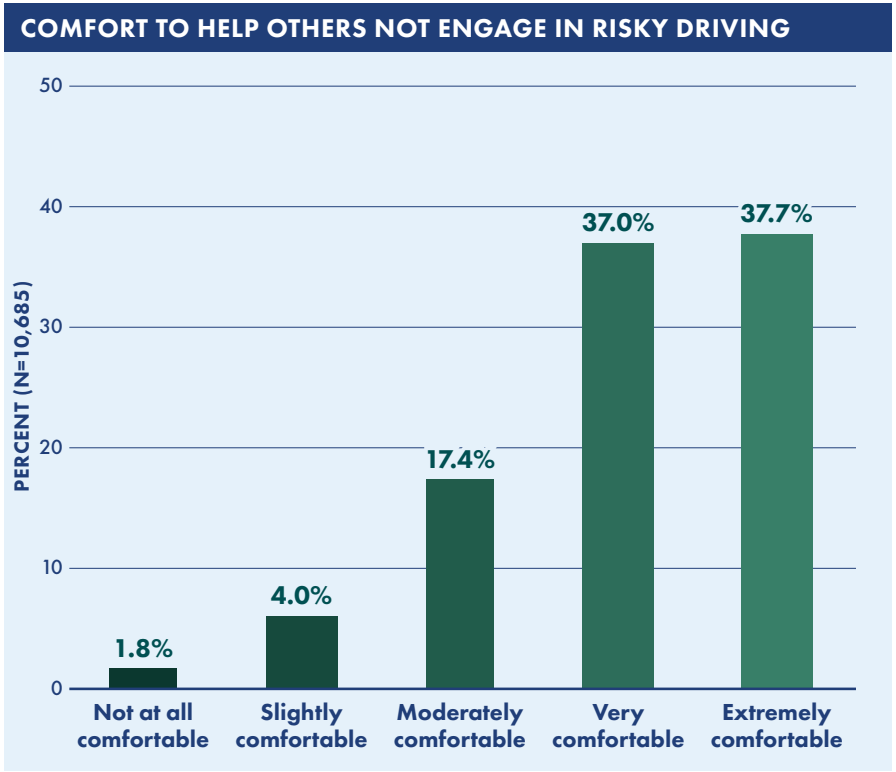



**FIGURE 3.** SELF-REPORTED COMFORT TO ACT IN WAYS THAT HELP OTHERS NOT ENGAGE IN RISKY DRIVING BEHAVIORS[1]

*Source: WA Traffic Safety Survey, 2023*

Prosocial traffic safety culture creates a social environment to encourage actions that increase the safety of others, which leads to support for shared traffic safety goals.

"Seeing the tears in my brother's eyes I knew something horrific had happened. Wrapping his arms tightly around me… his voice barely audible… he whispered, 'Trevor's been killed'. Gasping for breath, the gut-wrenching pain took me to my knees.

In an instant I went from being a banker to dedicating my lifework to preventing impaired driving in memory of my little son and in honor of my then six-year-old daughter who survived the crash. Public safety is up to each of us for all of us."

*—Linda Thompson, mother of Trevor Pierce age 3, killed on August 16, 1986, by an impaired driver (repeat offender)*

1 Question 31: How comfortable would it be for you to:
1. Ask someone to use a seat belt?
2. Take some action to prevent someone who is going to drive who is perhaps too impaired to drive safely (like getting them a ride, asking them to stay, etc.)?
3. Ask someone who is speeding or driving aggressively to slow down?
4. Ask a driver who is using their cell phone or who is distracted to focus on driving

# 1.4 EQUITY FRAMEWORK

The Centers for Disease Control and Prevention (CDC) describe transportation as an important social determinant of health that "affects the ability of people to move efficiently and safely through public and private spaces. Active transportation—specifically walking, cycling, and rolling—has direct and indirect impacts on health at both individual and community levels."[1] However, individuals using the transportation system experience significantly different outcomes related to death and serious injury. Some of these differences are attributable to lack of investment in segregated communities, defined by redlining policies that were put in place nearly a century ago in cities across the U.S.

Land use decisions are often skewed in favor of some interests over others. Underinvestment becomes institutionalized, and the negative effects have become worse over time. This produced neighborhoods with higher speed arterials and a lack of street lighting, sidewalks, protected/separated bike lanes, and pedestrian crossing locations.

CDC researchers concluded: "lower-income neighborhoods often lack sidewalks or have poorly maintained sidewalks with limited connectivity. Structural racism has governed the trajectories of communities across the United States, creating multidecade place-based effects. These effects are often not acknowledged as a fundamental cause of transportation inequities. Individually focused behavioral countermeasures and siloed infrastructure projects cannot sufficiently address present-day inequities. Transportation researchers must understand and address upstream factors—like redlining—that continue to undermine positive population-level transportation outcomes." Understanding the structural inequality underlying unsafe land use planning and road placement is important for selecting safety strategies and countermeasures that address the root causes contributing to serious injury and fatal crashes. A recent example is WSDOT's use of a social equity index to understand the correlation between equity characteristics and vulnerable road user crashes, as outlined in **Appendix D**.

The equity framework for achieving Target Zero is based on an understanding that interconnections among public policies for transportation, health, housing, and environment have resulted in inequities. Marginalized communities face disproportionate burdens and impacts that were created by policy makers and funders across these systems, including higher rates of roadway deaths for American Indian, Alaska Native, and Black road users.

Inequity in systems also occurred in part because transportation funders, policy makers, and design practices prioritized higher-speed, vehicle-oriented mobility through marginalized communities. As these systems were built decades ago, safety was defined as a reduction in total crashes (versus fatal and serious injury crashes). Congestion-related vehicle crashes were prioritized. These crash types usually resulted in property damage or minor injuries, versus less frequent but higher severity crashes.

1 Taylor, N.L., et. al. (2023). Structural racism and pedestrian safety: Measuring the association between historical redlining and contemporary pedestrian fatalities across the United States, 2010-2019.

Projects were often developed to reduce cost and complexity, leading decision makers to place roadways near or through marginalized neighborhoods, instead of other locations that were perceived as more valuable and/or more difficult to build in. These projects were built without places for the people in those same neighborhoods to walk, bike, and roll, resulting in negative effects on safety, culture, economic vibrancy, and personal security.

The current transportation system and network was built over decades, and it will take time to make changes to meet the needs and expectations of today. An equitable approach to transportation safety requires us to:

- Disaggregate data by population demographics such as race/ethnicity, income, housing, disability, English proficiency, other equity-related factors, and mode use to gauge existing and potential negative impacts within traditionally underserved populations.
- Understand how limited transportation options within different road design and operational context might affect transportation behaviors, and how to consider these factors in safety projects and programs.
- Address any differences in land use policy that led to underinvestment and disparate impacts for some demographic groups.
- Increase the effectiveness of traffic enforcement while eliminating disparities in its application. Focus efforts statewide on crash-causing driving behaviors and deemphasize low-risk infractions.
- Improve land use policy, infrastructure project selection, and transit access with a focus on historically underinvested communities.
- Include affected communities in transportation decision-making.

**Land Use.** Historical inequities in city planning led to inequitable zoning laws and practices, including housing segregation via redlining and exclusionary zoning. These policies led to the concentration of certain populations, particularly communities of color, in specific neighborhoods. The lack of transportation investment meant limited access to transportation, food, employment, health care, education, and recreation within a reasonable distance, further exacerbating existing inequities.

Marginalized people, who are most in need of affordable and reliable transportation options, may be the least likely to have these options in their neighborhoods due to lack of investment and roadways designed solely for the automobile. The lack of investment in transportation options increases their exposure to conditions that may result in roadway crashes. The outcome is a perpetuating cycle of poverty and inequity.

## Equity in Transportation Policy

Transportation investments that rectify past inequities would result in improved public health, access to jobs, workforce development, and environmental justice. Recent legislation in Washington, described below, provides an opportunity to invest in a more equitable approach.

**HEAL Act.** The passage of the Healthy Environment for All (HEAL) Act is the first statewide law in Washington to create a coordinated state agency approach to environmental justice. It prioritizes voices from disproportionately impacted communities to reduce disparities in health, safety, and quality of life.[1]

**Complete Streets.** The Move Ahead Washington transportation package passed in 2022 introduced a mandate for consideration of Complete Streets approaches in all significant transportation projects undertaken by WSDOT on state highways. Projects must consider and accommodate all road users and their modes of transportation, including walking, rolling, and using transit. While the directive applies to WSDOT projects, many other agencies around the state have adopted a local Complete Streets ordinance and are applying these principles to their transportation projects.[2]

**Growth Management Act.** In 2023 the legislature adopted several changes to the Growth Management Act that embed equity and transportation safety (HB 1181, 2023). These changes reduce potential crash exposure through support for transportation-efficient land use planning and mode shift.[3]

Changes included:

- Requiring use of multimodal level of service standards for roads, transit service, and active transportation, which shifts from a driving-centered evaluation to one that considers all modes.
- Explicitly incorporating requirements to plan for safety. “Priority must be given to inclusion of transportation facilities and services providing the greatest multimodal safety benefit to each category of roadway users for the context and speed of the facility.”
- Adding equity language, for example directing jurisdictions to identify system needs to equitably meet current and future demands and to equitably implement the multimodal network.
- Adding a requirement that local jurisdictions must include Americans with Disabilities Act (ADA) transition plans.

## Equity in the Safe System Approach

To implement the Safe System Approach equitably, must understand the causes of disparities in roadway safety outcomes, and makers must prioritize transportation investments in marginalized communities.

Our work to reduce crashes must include engaging the community so that we understand their needs. This requires communicating with non-English speakers, developing culturally relevant materials, and establishing platforms and engagements to hear from those who are unable to participate in public meetings because of costs, inability to travel longer distances easily or at all, caregiving responsibilities, and other factors.

1 WSDOT Environmental Justice

2 WSDOT Complete Streets

3 WSDOT Land Use and Transportation Planning

## Socioeconomic and Demographic Factors in Washington

Within Washington, urban, suburban, and rural areas of the state exhibit substantial differences related to how people travel. Several state and national datasets that are helpful in identifying communities that experience persistent poverty (USDOT Areas of Persistent Poverty), are disadvantaged (USDOT Disadvantaged Communities score), are socially vulnerable (the CDC Social Vulnerability Index), or experience environmental health disparity (Washington Department of Health [WA DOH] Environmental Health Disparities Score). WA DOH provides online maps to visually communicate data on social, health, and safety vulnerabilities by census tract.[1]

Responsibility for road design, construction, maintenance, enforcement, post-crash care, and safety is divided among city, county, state, and federal jurisidictions and Tribal nations. County roads account for the greatest number of road miles, yet they often exhibit the least funding investment per mile. State and county roads in unincorporated areas are those that most frequently cross and abut Tribal lands.

1 Washington Tracking Network

The CDC Social Vulnerability Index considers multiple factors in four domains:

**HOUSEHOLD COMPOSITION AND DISABILITY**

- POPULATION 65+ (%)
- POPULATION UNDER 18 (%)
- POPULATION WITH A DISABILITY (%)
- SINGLE PARENT HOUSEHOLD (%)

**SOCIOECONOMIC DETERMINANTS**

- MEDIAN HOUSEHOLD INCOME
- NO HIGH SCHOOL DIPLOMA (%)
- POPULATION 19 TO 64 WITH NO HEALTH INSURANCE
- POPULATION LIVING IN POVERTY (%)
- UNEMPLOYED (%)

**HOUSING TYPE AND TRANSPORTATION**

- HOUSING WITH 10+ UNITS (%)
- MOBILE HOMES (%)
- NO ACCESS TO A PRIVATE VEHICLE (%)
- OVERCROWDED HOUSING (%)
- POPULATION LIVING IN GROUP QUARTERS (%)

**RACE, ETHNICITY, AND LANGUAGE**

- LIMITED ENGLISH PROFICIENCY (LEP)
- PEOPLE OF COLOR (RACE/ETHNICITY)

People in historically marginalized, segregated, and underinvested census tracts in Washington also experience higher rates of serious injuries and fatalities in traffic crashes.

Individuals with lower incomes are increasingly forced to find lower-cost housing far outside of population centers. As a result, they must travel farther to get to their workplaces, schools, medical care, shopping, and other locations as part of their daily lives. This added distance creates additional exposure due to miles traveled to reach these locations on facilities that may lack safety features found on other roadways.

Others who are not able to afford a personal vehicle are more likely to walk, bike, or roll, either as their primary mode or to access public transit. This leaves them more vulnerable and exposed to a higher likelihood of crashes that are more serious when they occur.

## Community Concerns: A Delicate Balance to Achieve Road Safety Outcomes

One of the challenges we must address is a perception that enforcement of traffic laws is in conflict with the goals of equity. For enforcement to be most effective, it needs to be equitably applied, which means that law enforcement focuses on deterring high-risk behaviors. Some community members experience encounters with law enforcement as risky or dangerous.

Traffic stops are the most common way in which members of the public encounter law enforcement. Historic disparities in traffic stops and arrests in communities of color in Washington and the United States must be addressed when we engage these communities around behavioral traffic safety, which has traditionally relied upon traffic enforcement (and the related threats of fines or arrest) as a primary deterrent and countermeasure.

While a substantial majority of Washingtonians see effective traffic enforcement as essential to maintaining safer roads, groups that have historically experienced the greatest disparities in the criminal justice system expressed lower support for traffic enforcement on the Statewide Traffic Safety Survey (2023). The level of support is lower among Black survey respondents, 54% expressed support for enforcement of distracted driving laws for using a cell phone, and 60% expressed support for enforcement of laws against driving under the influence of alcohol. Support for enforcement of speed laws among Black respondents—specifically for driving 10 or more miles over the posted limit—was 43% (37% were opposed and 20% were neutral). This occurred even though Black respondents were more likely to view speeding as very dangerous or extremely dangerous (43% versus 35% of all other respondents).

> "Traffic crashes are a legacy of colonization. We did not ask for these roads."
>
> *—Tribal Representative, October 2023, Target Zero Listening Session*

Deep and ongoing engagement and continued law enforcement training will be essential to craft and implement effective strategies in disproportionately affected communities. Equitable enforcement practices are likely to be more effective, as enforcement should focus solely on preventing, reducing, and disrupting the most dangerous behaviors on the road. Research in Connecticut,[1] North Carolina,[2] and elsewhere has shown that serious traffic crashes and fatalities can be decreased, along with racial disparities in traffic stops, when law enforcement agencies use data to focus officers' attention on high-risk locations and high-risk driver behaviors.

1 https://www.nber.org/system/files/working_papers/w32692/w32692.pdf

2 https://injepijournal.biomedcentral.com/articles/10.1186/s40621-019-0227-6#Sec1

## Advancing Equity to Save Lives

It will take time, effort, patience, and mutual understanding to engage affected communities around solutions that effectively address disparities in social vulnerability, under-investment, enforcement actions, and the steps to provide roadway safety to everyone.

Addressing the most harmed populations in our society will reinforce Washington's commitment to zero fatalities and serious injuries for everyone. Today's transportation and community safety leaders must address the negative legacy created by prior systemic choices and take action to avoid burdening more people and places with similar decisions today and in the future. We cannot reach Target Zero without correcting these disparities so the system provides benefits to all.

### Enforcement and Equity

Washingtonians clearly want effective and equitable enforcement of traffic laws. Multiple research studies have found that law enforcement policies and practices can be applied in ways that increase safety, reduce crime, and reduce racial disparities.

The Washington State Patrol (WSP) employs enforcement strategies and trains its troopers to operate in ways that are consistent with these methods, including:

- Using real-time crash and crime data to proactively deploy troopers to high-risk areas where they focus on high-risk driving behaviors, such as speeding, distraction, and impairment by alcohol or drugs.
- Using extensive public outreach before, during, and after high-visibility patrols (HiVE) so that the public is aware of these efforts and where they are happening. This approach is proactive and preventative, providing motorists the opportunity to follow traffic laws and avoid stops and citations. WSP reports the outcomes of these patrols by district so that the public is aware of their impact.
- WSP training dictates that troopers are to provide an introduction first during their initial contact with a motorist followed by a brief explanation of why the motorist was being contacted. Research indicates that notifying Black motorists for the reason they were stopped by law enforcement can reduce the likelihood of escalation into an arrest or use of force by 2.5 times.[1]

1 Escalated polices stops of Black men are linguistically and psychologyically distinct in their earliest moments, PNAS, 2023

# 1.5 TRIBES AND TARGET ZERO

Through the Centennial Accord, the state and Tribes have formally committed to working together on a government-to-government basis to address several common problems, including traffic safety issues. Tribes play a vital role in traffic safety outcomes and are active partners with other agencies in addressing the goals identified in the Target Zero Plan.

### CRASH HISTORY

From 2020-2022, 107 American Indians and Alaska Natives (AI/AN) died in traffic crashes in Washington. These crashes occurred on reservation and non-reservation roadways. During that period, the AI/AN traffic fatality rate by population was 39 deaths per 100,000 people in the population. This rate is more than three times higher than the rate for the next highest race/ethnicity.

Federal and state funding sources typically require that grant recipients expend their own resources initially and then submit invoices for reimbursement by the funder. These requirements pose significant risks and barriers to Tribes, including those with members who would benefit most from these programs.

**FATALITY RATE IN WASHINGTON, 2020–2022**

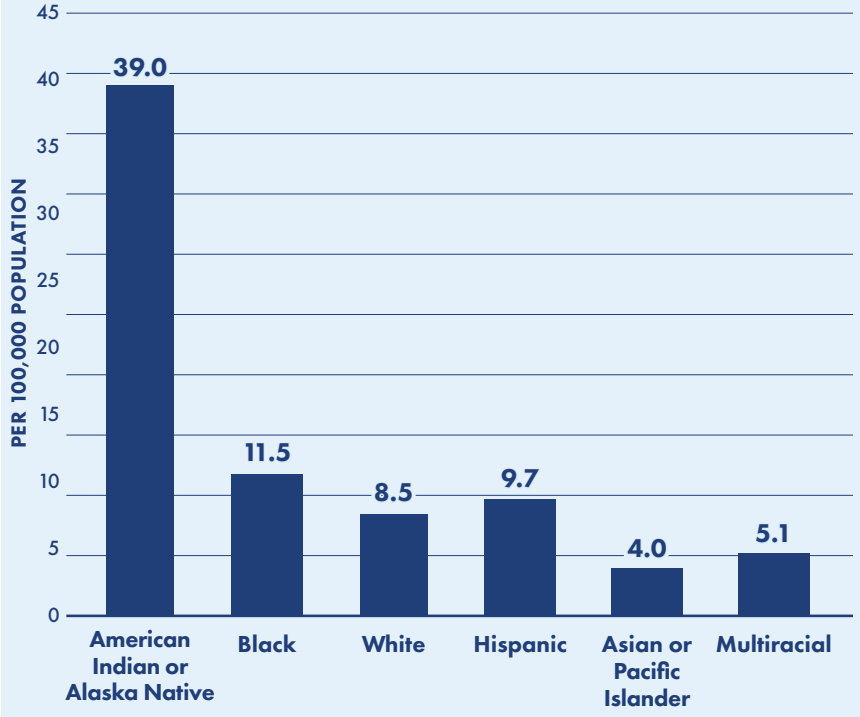



**FIGURE 4.** FATALITY RATE PER 100,000 POPULATION BY REPORTED RACE IN WASHINGTON, 2020-2022

During this period, 69% of the AI/AN people killed in traffic crashes died in events occurring in just six of Washington's 39 counties, as noted in **Table 1**. More than one-third occurred in Yakima County alone. Yakima County also experienced one of the highest proportions of all fatalities that were AI/AN people; this list also includes Ferry and Okanogan counties.

> "For those making recommendations for changes on reservations, please… review some of the legal complications that reservations deal with related to land ownership, right of way procurement, road law enforcement, and other legal challenges Tribes experience."
>
> *—Tribal listening session participant*

**TABLE 1.** COUNTIES WITH THE **HIGHEST NUMBER** OF AMERICAN INDIAN AND ALASKA NATIVE PERSONS KILLED IN TRAFFIC CRASHES, 2020-2022

| COUNTY | AI/AN % OF COUNTY POPULATION | AI/AN FATALITIES | ALL TRAFFIC FATALITIES | AI/AN % OF COUNTY FATALITIES |
|---|---|---|---|---|
| YAKIMA | 6.6% | 37 | 154 | 24.0% |
| KING | 1.1% | 12 | 398 | 3.0% |
| SPOKANE | 1.7% | 7 | 150 | 4.7% |
| OKANOGAN | 12.5% | 6 | 22 | 27.3% |
| WHATCOM | 3.1% | 6 | 43 | 14.0% |
| SNOHOMISH | 1.6% | 6 | 146 | 4.1% |

**TABLE 2.** COUNTIES WITH THE **HIGHEST PERCENTAGES** OF AMERICAN INDIAN OR ALASKA NATIVE PERSON TRAFFIC FATALITIES, 2020-2022

| COUNTY | AI/AN % OF COUNTY | AI/AN FATALITIES | ALL TRAFFIC FATALITIES | AI/AN % OF COUNTY FATALITIES |
|---|---|---|---|---|
| FERRY | 18.3% | 4 | 8 | 50.0% |
| OKANOGAN | 12.5% | 6 | 22 | 27.3% |
| YAKIMA | 6.6% | 37 | 154 | 24.0% |
| PEND OREILLE | 3.1% | 2 | 10 | 20.0% |
| CLALLAM | 6.0% | 5 | 27 | 18.5% |
| WHATCOM | 3.1% | 6 | 43 | 14.0% |

**Contributing Factors.** Attributes related to AI/AN fatalities match statewide emphasis areas. The highest proportion is Impaired Road User Involved, at 67% (72 of 107). See **Figure 5** on the following page.

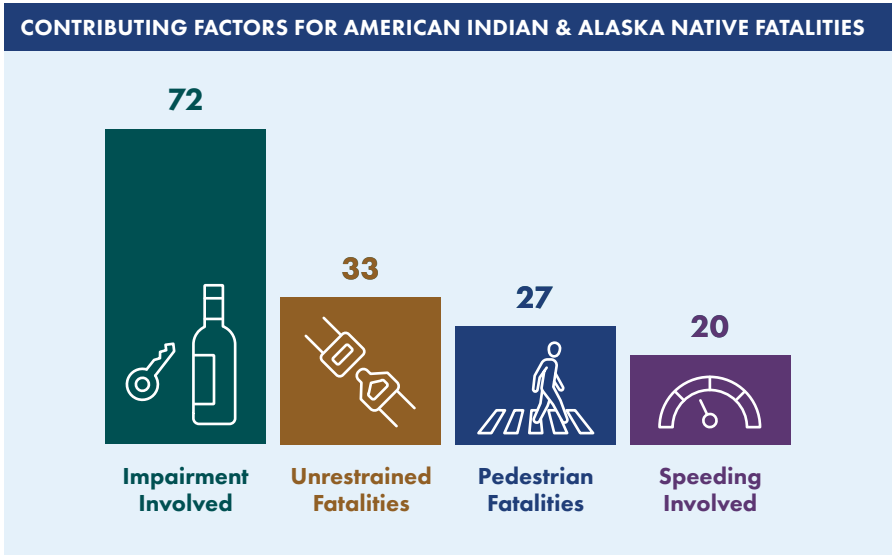



**FIGURE 5. TOP 4 RISK FACTORS INVOLVED IN AMERICAN INDIAN AND ALASKA NATIVE FATALITIES, 2020-2022**

**Note: Categories are not mutually exclusive. n=107*

These are the statistics, but the underlying stories are about real people and the families they leave behind. The numbers clearly show the higher likelihood of an AI/AN person being killed in crashes that involve certain contributing factors.

Compared to all other racial and ethnic groups in Washington, AI/AN fatality rates are substantially higher across several emphasis areas:

- Unrestrained Fatalities: 7.2 times
- Pedestrian Fatalities: 6.3 times
- Impaired Road User Involved Fatalities: 5.4 times
- Total Fatalities: 4.8 times
- Speeding Involved Fatalities: 2.7 times

WTSC also conducts case file reviews of individual crashes, including pedestrian and bicyclist crashes under RCW 43.59.156. While they are small in number, fatalities of Native people are important to understand as American Indians and Alaska Natives are the most overrepresented groups in traffic fatalities across the state.

### SYSTEM CHALLENGES

It is important to recognize the disparity in magnitude and the need to identify responses in consultation with Tribal leaders in a manner that respects and reflects Indigenous knowledge and culture.

Reservations often include a mix of Tribal, state, county, city, and Bureau of Indian Affairs (BIA) roads, which creates jurisdictional complexities with law enforcement, Emergency Medical Services (EMS), crash reporting, road maintenance, and capital safety projects. Additionally, many Tribes in the state hold properties that are non-contiguous to their reservations, which provide vital services to their communities.

One of the problems that compounds these jurisdictional barriers is the set of complex rules governing federal and state funding. Many Tribes employ few if any people to plan, build, and maintain transportation systems for Tribal members. Like other governmental entities, they rely upon the availability of federal and state funds available through grants. Tribes with few staff members often lack the positions needed to apply for grants and then monitor, track, and account for grant funds. Most grants must go to the jurisdiction that owns and operates the facility; Tribal members rely on using roads the Tribe does not own and thus cannot change. Federal and state funding sources typically require that grant recipients expend their own resources initially and then submit invoices for reimbursement by the funder (usually a state agency). These funding requirements and limitations pose significant risks and barriers to Tribes, including those with members who would benefit most from these programs. Agencies do not have the discretion or flexibility to modify these requirements, even when they believe it would be reasonable to do so.

To address this complex mix of jurisdictions and experts, Tribes have multiple forums that meet regularly for transportation and traffic safety issues. The WA Tribal Transportation Planning Organization (TTPO) holds quarterly meetings to support the development of Tribal transportation planning capacity. The TTPO goal is to improve Tribal government's planning and programming activity through enhanced coordination with Tribal, federal, state, and local governments. Several Tribes throughout Washington received funding under USDOT programs to develop their own traffic safety plans for their reservations. The unique priorities of individual Tribes are reflected in those plans.

## Priority Strategies

Tribal representatives identified as priority strategies to reduce the frequency and severity of roadway crashes on Tribal lands and those crashes involving American Indians or Alaska Natives.

**Increase Tribal Representation in Leadership Positions.** The input of Tribes through representation can influence projects and strategies to improve roadway safety for American Indians and Alaska Natives and reduce the potential for crashes on Tribal lands. In 2019, the legislature passed a law tying state transportation funds to the inclusion of Tribes on regional transportation planning boards.

**Tribal Traffic Safety Plan:** Tribal agencies seek funding to support the gathering and analysis of traffic crash and fatality data to develop a Tribal Traffic Safety Plan. This plan can help Tribes identify needs specific to their geographies and communities, and then prioritize projects and strategies.

**Seat Belt and Child Passenger Restraint Use:** The WTSC Tribal Liaison has participated in a partner group to provide input into the development of a "How-To Guide for Increasing Seat Belt Use in Indian Country." The focus was on developing a guide for state transportation officials and other entities to help them be more responsive to Tribes' needs and explore culturally tailored countermeasures and strategies. Information gleaned from these partner meetings will help support countermeasures and strategies to address seat belt use rates amount Washington Tribes. The How-To Guide should be finalized in late 2024.

Child passenger safety technician training courses (CPST) will continue to be offered to Tribal Nations. The COVID pandemic severely disrupted these and other Tribal traffic safety activities. In the past year (2023-24) CPST courses were offered to the Muckleshoot Indian Tribe, Spokane Tribe of Indians, and the Confederated Tribes and Bands of the Yakama Nation.

**Tribal Law Enforcement Tools:** The WTSC Tribal Liaison is engaging Tribal police chiefs in traffic safety discussions and planning to better understand their needs, which will be unique for each Tribe. These discussions also allow an opportunity for respectful inclusion of Indigenous knowledge to support much more meaningful decision making and partnerships with WTSC. The size and location of Tribal lands and police agencies vary widely. Some only have a few officers. In addition to basic equipment and enforcement tools, other effective tools include incentives for positive behavior, which have been effective in the past and fit with their prosocial traffic safety culture.

Examples include the following:

- Bike and pedestrian safety event equipment (bike helmets, pads, bike repair kits, reflectors, coloring books, helmet stickers)
- Incentives for seat belt checks (t-shirts, sweatshirts, reflective vests)
- Portable Speed Feedback Signs
- Automated External Defibrillators for patrol cars
- Portable Breath Tests
- LiDAR Speed Device

**Active Transportation Grants:** WSDOT's Active Transportation Division oversees grant programs that invest in pedestrian and bicyclist facilities, speed management and traffic calming, and education or encouragement programs. Tribes are eligible for all of these and in 2023 the division began developing an active transportation assistance program prioritizing Tribes and other entities that have not received grants in the past. This program aims to build capacity and advance the partnerships needed to provide safety improvements on streets and roads that serve Tribal members and lands.

# 1.6 THE SAFE SYSTEM APPROACH

The Safe System Approach (SSA) recognizes that safety is increased when we examine how all parts of the system interact to support and strengthen all parts of the system. Vision Zero and the Sustainable Safety Approach originated through efforts in Sweden and The Netherlands, respectively, in the 1990s. The combination of their thinking evolved into what we know today as the SSA. Washington began its journey toward this approach when WSDOT adopted the sustainable safety principles in 2013, and then updated the WSDOT design manual in 2015. In the 2019 update of Target Zero, Washington brought the SSA into its safety practices. Since then, Washington has adapted this approach to incorporate local innovations and international advances in safety practices.

The Washington State SSA provides a framework for operationalizing traffic safety among policy makers, system owners and operators, and road users. This approach reflects the obvious truth that preventing death and serious injury requires multiple elements to be in place so that if one fails, other layers of protection are available to prevent the most tragic outcomes. We apply it in an equitable manner, so it benefits everyone using the system. **Figure 6** illustrates Washington's version of the SSA Principles (outer ring) and SSA Elements (inner ring).

The SSA aims to reduce fatalities and serious injuries by creating a system that supports the following elements: safer land use, safer vehicles, safer speeds, safer roads, safer road users, and post-crash care. These elements are supported by core principles:

- Death and serious injuries are unacceptable
- We support safe road use
- We work to reduce large crash forces because humans are vulnerable
- We all work together with the philosophy of a shared responsibility
- Safety is proactive
- We strengthen all parts of the system to create redundancy

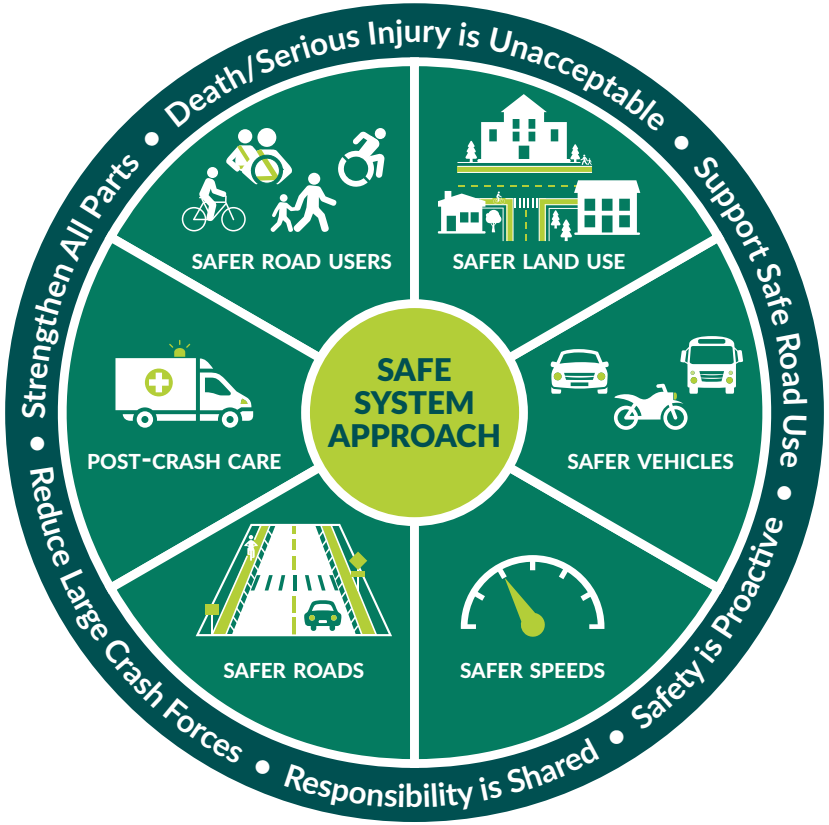



**FIGURE 6.** WASHINGTON STATE'S SAFE SYSTEM APPROACH

## Safe System Approach Principles

Washington's SSA framework is based on six principles, starting with the value statement (deaths and serious injuries are unacceptable), followed by the primary reason for injury outcomes (prevent exposure to large forces) and required actions (safety is proactive, support safe road user behaviors, and shared responsibility). The principles finish with a direct connection to the interdependent SSA elements: strengthen all parts.

### PRINCIPLE 1: DEATH OR SERIOUS INJURY IS UNACCEPTABLE

People deserve to be able to travel safely to their destination. Whether they drive a car, take the bus, walk, roll, or bicycle, they should not be exposed to the risk of death or serious injury during their travels. Target Zero partners are focused on understanding the safety challenges and opportunities within the transportation system and prioritizing strategies to prevent death and serious injury.

> **"THESE ARE NOT JUST DOTS ON A MAP."**
>
> *— Tribal representative, Target Zero listening session*

High-level officials have committed to the elimination of fatalities and serious injuries, including the WSDOT Secretary's 2023 Executive Order E1085.01: Advancing the Safe System Approach for All Users. Its purpose is to achieve the goals of the Target Zero Plan, and it further states, "Through the Safe System Approach, WSDOT intends to systematically reduce fatal and serious injury crash potential statewide."

### PRINCIPLE 2: SHARED RESPONSIBILITY

All parties within the system—including government at all levels, private industry (e.g., vehicle manufacturers, consulting firms, etc.), nonprofit/advocacy organizations, the healthcare system, first responders, researchers, and individual road users—are vital to preventing fatalities and serious injuries on Washington's roadways.

The transportation system is comprised of many elements that influence each other, with many partners who are responsible for these different elements. Partners can be classified as "traditional" (e.g., engineers, law enforcement agencies) and "influencers" (e.g., families, social services, land use). Traditional partners have the highest responsibility and are held accountable for building and operating a safe transportation system; influencer partners are those without a formal traffic safety role but with an interest and influence over safety within their social environment. Target Zero partners include key federal and state traffic safety agencies, along with Tribal governments, cities, counties, regional planning organizations, community-based organizations, and others. Collectively, this partnership is responsible for taking actions to reduce or prevent crashes through safety-focused projects, programs, initiatives, and campaigns all around our state.

### PRINCIPLE 3: SUPPORT SAFE ROAD USER BEHAVIOR

People make mistakes and sometimes make behavioral decisions that contribute to crashes. Many systems and factors lie beyond the direct effects of transportation safety professionals (e.g., funding for early prevention and intervention services, availability of treatment facilities for mental health or substance misuse, housing costs, etc.). However, transportation professionals can support and encourage safe behaviors with design and policy decisions. A transportation system should be self-explaining and self-enforcing, meaning that roads are designed and operated to support safe road use, to reduce the ability to travel at excess speeds, and to be forgiving of errors. When supported by education, these designs reduce the potential for road user behaviors that can lead to death and serious injury.

A safe system is one that 1) encourages road users to comply with the safe behavior standards, 2) removes conditions that may influence the violation of those standards, and 3) is designed to ensure errors and violations do not result in serious or fatal injuries. Planning, designing, and operating roadways and active transportation facilities that encourage safe behaviors and remove opportunities for unsafe behaviors will help to protect all road users.

Other layers of defense to encourage safer behaviors are:

- Prosocial safety culture
- Culturally relevant education and training
- Reminders from signs, pavement marking, and signals
- Self-explaining roadways
- Law enforcement

> "In a well-designed system, safety measures make sure that human fallibility does not lead to human fatalities."
>
> *—Pete Buttigieg, U.S. Secretary of Transportation*

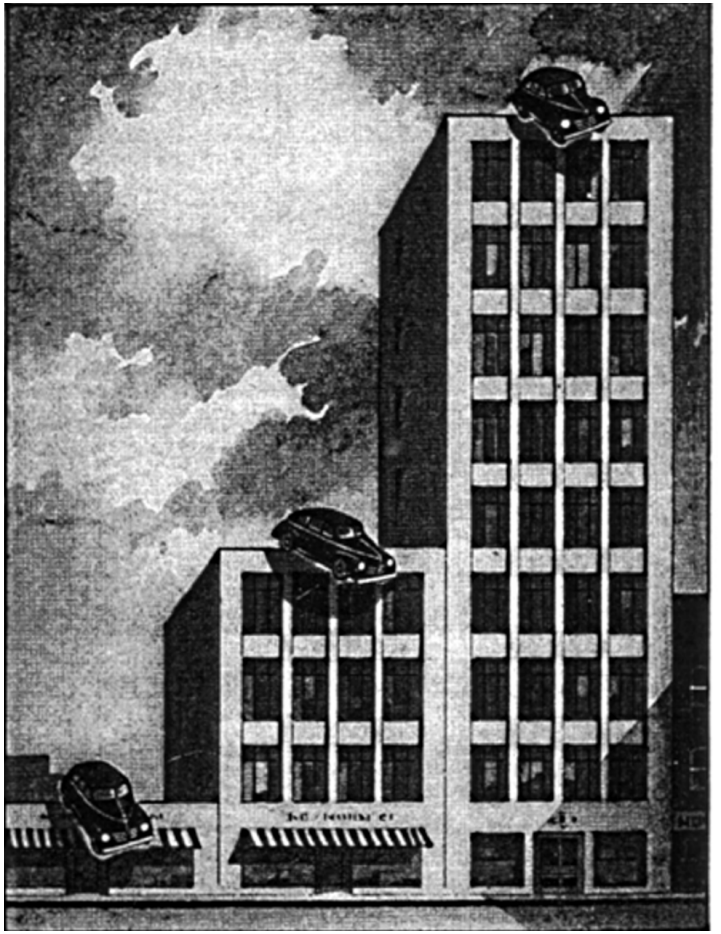
### PRINCIPLE 4: PREVENT EXPOSURE TO LARGE FORCES

The human body has limits for tolerating crash forces before death or serious injury occurs; therefore, it is critical to design and operate a human-centric transportation system that accommodates and protects physical human vulnerabilities.

The average car weighs 4,000 pounds (which is significantly heavier than 30 years ago).[1] The transfer of force in equation form is $KE=(1/2)mv^2$, where KE = Kinetic Energy; m = Mass of an object; and v = Velocity. When this large object collides at high speed with a fixed object, another vehicle, or a person, the impact severity is high. It increases exponentially by the driver's speed.

The connection between the force equation and safety has been understood for a long time, illustrated by this image from 1936 (see **Figure 7**).[2] A vehicle traveling 20 mph generates the same force of impact as that same vehicle dropping from a height of 13.5 feet. At 40 mph, the force is equal to the vehicle dropping from 54 feet.

> "We need to find the balance between speed and efficiency with regard to motor vehicles and pedestrian/bicycle interactions."
>
> *—Listening session participant in Yakima County*



**20 mph**
**Height: 13.5 ft**

**40 mph**
**Height: 54 ft**

**60 mph**
**Height 121.5 ft**

**FIGURE 7.** SPEED AND THE FORCE OF IMPACT

1 How much does the average car weigh?

2 *Man and the Motor Car* by Robert Whitney, 1936.

### PRINCIPLE 5: SAFETY IS PROACTIVE

With the proactive approach we identify and address potential contributing factors and crash types in the transportation system, rather than waiting for crashes to occur and reacting afterwards.

Historically, safety investments have been focused on locations where crashes have been reported. While this reactive approach has been beneficial, fatal and serious injury crashes rarely occur repeatedly at the same location over time. From a system perspective, we can take proactive actions that reduce the contributing factors to crashes by mitigating recognizable, predictable factors before future crash events occur.

For example, a jurisdiction may identify lane departure crashes as one of its most common contributors, but no single location has experienced multiple fatal or serious injury crashes. Proactive treatments such as curve warning signs, pavement marking, and rumble strips can be implemented systemwide to reduce the potential for future lane departure crashes.

### PRINCIPLE 6: STRENGTHEN ALL PARTS

Reducing likelihood, exposure, and severity of crashes requires that all parts of the transportation system be strengthened, so that if one system element fails, the others remain in place to prevent serious or fatal injury. This principle ties directly to the SSA Elements: safer land use, safer roads, safer road users, safer vehicles, safer speeds, and post-crash care.

For example, speeding may be a risk factor when driver operating speeds are too high for the location and type of road use present (e.g., higher pedestrian activity). Strengthening the system could involve multiple layers, including fostering a culture that discourages speeding and reducing posted speed limits based on land use context to prioritize injury minimization. In addition, road users can be educated on why their operating speed matters. Deterrence and enforcement through high visibility or emphasis patrols can be layered on to reinforce the posted speed limit. System owners can implement operational and design changes to the roadway itself to separate users and communicate that lower speeds are more appropriate for the given context or make physical changes to the roadway that reduce speeds. In Figure 8, the yellow line represents a potential serious or fatal injury, and the vertical slices represent how SSA elements work as a system to prevent that outcome.

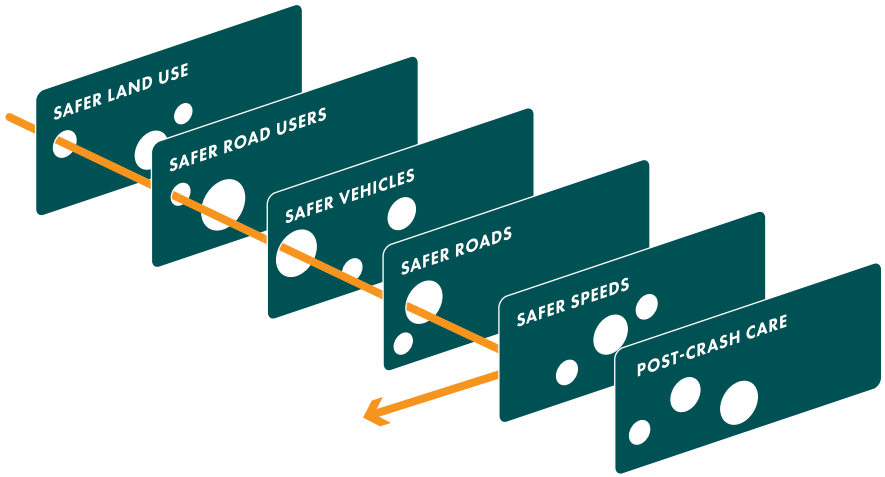



**FIGURE 8. THE SAFE SYSTEM APPROACH PREVENTS SERIOUS OR FATAL INJURY EVEN WHEN ONE ELEMENT FAILS**

## Safe System Approach Elements

The six Washington SSA elements used in Target Zero are described in the following sections.

### ELEMENT 1: SAFER LAND USE

When land use and transportation are planned efficiently, the necessities of daily life can be closer together and easier to access, which makes active transportation modes more viable and results in fewer motor vehicle trips. This reduces exposure to crashes, promotes walking and biking, reduces congestion and air pollution, and contributes to a prosocial traffic safety culture. The land use and transportation systems work together to create the network within which people operate and interact with one another and the adjacent land use.

More vehicles within the transportation system results in a greater potential for crashes. Transportation systems like buses, light and heavy rail, and ferries help to reduce exposure by removing vehicles from the system, as does active transportation use. Shortening travel distances overall also reduces exposure, and therefore crashes. Safer land use planning is critical to the safe system as it influences how travel will occur and how attractive the use of transportation modes beyond driving are. To achieve optimal transportation safety for people using all modes, land use planning that prioritizes safety and equitable access to mobility is a fundamental starting point.

Land use decisions determine development within the transportation system, the use of different transportation modes, and how much time and effort each trip will take. Land use decisions should facilitate multimodal trips for all purposes, from the 20% of trips for commute purposes to the other 80% of our trips for activities like getting groceries, taking children to school, going to the park, and participating in community life. Separating pedestrians and cyclists from motor vehicle traffic reduces conflicts and allows people to feel safer. Infrastructure investments and land use policies that address people's perceived safety concerns will increase willingness to use multimodal transportation and in doing so reduce the exposure, likelihood, and severity of crashes.

Such approaches are particularly critical in low-income and other under-invested communities where residents are often more dependent upon lower-cost public transit and active transportation options (walking and rolling) rather than travel by private vehicle. They are essential for non-drivers.

Transportation-efficient locations where many destinations are within close proximity reduce the number and length of trips people need to make. With sufficient density of activity (housing and destinations), roadway infrastructure designs that support active modes and transit access enable mode choices. The associated treatments—e.g., shorter crossings, wide sidewalks, protected bike lanes, etc.—reduce exposure, likelihood, and severity of crashes for all users.

For example, siting primary schools in infill locations (versus greenfield development) makes it easier to provide safe routes to school for students close to housing. While the number and mix of land uses is important in creating vibrant places, the form and scale also matter. Placing limits on block lengths, as was recently codified in the City of Pasco, creates a more favorable environment for pedestrians.[1] Providing housing and services that meet the needs of seniors in locations with frequent and reliable transit service supports their transportation independence as they age out of driving safely.

Infill development in existing urban areas and the creation of town centers all contribute to improving the efficiency of land use and safety. Conversely, greenfield development, especially when it leapfrogs busy roadways, creates unfavorable conditions for people who now must cross busy facilities with high-speed motor vehicles. The potential conflicts are worsened in locations where there is little expectation for the presence of active transportation users. Land use decisions send strong context signals to drivers about what to expect and how to drive to keep everyone safer.

### ELEMENT 2: SAFER ROAD USERS

Road user decisions and behaviors fundamentally increase or decrease the likelihood of a crash occurring and the severity of a crash when it occurs. For instance, drivers choosing to drive impaired by substances or drowsy from lack of sleep are less fit to drive, as they have slower reaction times and make poor driving decisions. Another example is road user convenience, which shows up as red light running, speeding, motorcyclists splitting lanes to ride between vehicles, or active transportation users crossing against a Don't Walk traffic signal.

Our safety culture, regulations, and personal values set and define the expectations and boundaries for road user behaviors. These aspects are often articulated and enforced with traffic laws and the "rules of the road."[2] Speeding is one example. Regulatory speed limits should be set based on the context and design of the roadway. However, the speed a driver selects is affected by more than the law. Just like any human behavior, their speed selection is socially influenced and constructed by what is generally deemed acceptable. For example, neighbors may have shared expectations about an "appropriate" safe speed in their communities, while drivers on a freeway may assume everyone around them has shared expectations about the acceptability of exceeding the posted speed limit. Thus, road users may feel a social obligation to abide by these publicly acceptable behaviors in addition to rules determined through traffic laws.

1 City of Pasco, Ordinance No. 4694, Amend PMC Title for Street Connectivity

2 Revised Code of Washington (RCW) 46.61, Rules of the Road.

Strategies with the goal of increasing road user intentions to behave safely include more formal legal and policy approaches, as well as less formal social norms:

- **Traffic Safety Culture:** Strategies to grow a positive traffic safety culture can both encourage safe behaviors and discourage violations. Such strategies may rely on social rewards and sanctions from the groups in the social environment, including peers, families, neighbors, employers, co-workers, and other community members. A prosocial traffic safety culture goes beyond the individual to benefit all.
- **Education:** Driver, motorcyclist, and bicyclist education programs communicate the laws (and norms) that define the standards for safe behavior and the initial development of the skills necessary to practice these safe behaviors. Driver education can also teach skills for road users and prepare them to recognize conditions and scenarios that may pose higher potential for a crash. Public education campaigns—developed and provided in a culturally-relevant manner—help to educate all road users on safe road behaviors. Informally, everyone learns from those around them. Children learn road user behaviors from their parents and other adults by observing them. Employees in businesses and agencies with a fleet may receive training in the workplace. Those operating motorcycles or commercial motor vehicles such as heavy trucks must take additional training to be familiar with the handling characteristics of these vehicles.
- **Enforcement:** Traffic laws support the separation of road users in time and space, providing a level of safety for all road users if people follow the laws. Legal systems communicate the laws associated with safe driving and the penalties for violating these rules. Law enforcement agencies help remind road users of these laws by being visible and present. When necessary, they intervene when road users engage in risky and illegal behaviors. These enforcement functions also deter those who do not come into direct contact with law enforcement. Since sworn officers cannot always be everywhere, automated enforcement systems, when selected and operated responsibly and effectively, can provide a continuous presence to deter behaviors like speeding and red light running.

### ELEMENT 3: SAFER VEHICLES

Vehicle design serves multiple goals, including efficiency, comfort, status, recreation, business activity, and safety of those inside the vehicle. Ideally, vehicles are designed and regulated to facilitate safe driving behaviors and minimize the frequency and severity of crashes using safety measures that incorporate the latest technologies. Vehicles with increased mass will increase the magnitude of the transfer of force when a crash occurs. In addition, vehicle designs and related policies can increase the likelihood of a crash occurring and the severity when it does occur:

- **Speed.** Most vehicles sold can travel at speeds well above posted speed limits, and no vehicles currently have standard controls to limit driver speeds based on what is safe or legal.
- **Mass.** While electric vehicles are designed to be more energy efficient and reduce emissions, they are heavier and produce more horsepower and faster acceleration compared to similar gas-powered vehicles. This combination can increase crash forces.

- **Grill Height.** Light duty trucks have become larger over time with a taller box-shaped front grill, making it more difficult for drivers to see objects immediately in front of their vehicle, including young children. When a crash occurs, the vehicle strikes pedestrians or bicyclists higher on their bodies, resulting in head and thoracic injuries that are more serious than a crash involving a vehicle with a low front hood profile. According to an Insurance Institute for Highway Safety (IIHS) review of 18,000 pedestrian deaths, the increased risk of death based upon hood height and shape were:
  - » +26% for a blunt shaped front end (>65 degrees) with a height between 30-40 inches
  - » +45% for hood heights above 40 inches, including sloped (less than 65 degrees) or blunt shapes.[1]
- **Vulnerable User Safety.** Vehicle safety improvements over the past few decades have decreased crash forces for vehicle occupants. However, federal regulations have not prioritized improving safety for people outside the vehicle.
- **Triple-trailers.** Some states outside Washington allow triple-trailers (a large truck with three separate trailers connected) and higher vehicle weight limits. This increases the vehicle mass while decreasing its maneuverability and deceleration, all of which increase crash forces.
- **Inspections.** Washington does not require vehicle inspections, which allows vehicles in poor working order to remain on the road.
- **Motorcycle Design.** Motorcycles can travel at high speeds and offer riders less stability and protection than cars and trucks.

Clearly, there is a need to improve vehicle design features for safety. There are also new technologies being developed that should be standardized across all vehicles, including technology on the horizon to improve pedestrian detection in automatic braking systems, detection systems that can disable the ignition if impairment is detected, and automatic speed limiters that restrict a driver from exceeding posted speeds. Safety ratings should also evolve to holistically consider all aspects of safety for drivers, other vehicle occupants, and all road users who could be exposed to a crash with the vehicle.

While the state's regulations do not include vehicle safety ratings, we do have regulatory powers associated with driver education and license endorsement requirements that could address growing vehicle sizes and unfamiliar technologies. Taxes and fees can also be structured to incentivize the purchase of vehicles that provide greater safety to vehicle occupants, other motorists, and active transportation users.

1 Hu, W., Monfort, S.S., & Cicchino, J.B. (2023). The association between passenger-vehicle front-end profiles and pedestrian injury severity in motor vehicle crashes. Insurance Institute for Highway Safety.

### ELEMENT 4: SAFER ROADS

In the safe system, roadways are designed to reduce conflicts among all road users, including people driving personal and commercial vehicles, transit operators, pedestrians, and bicyclists. Because conflicts cannot be eliminated completely, designing transportation infrastructure to accommodate human mistakes and injury tolerances can reduce the severity of crashes that do occur. Examples include physically separating people using different modes and traveling at different speeds, providing dedicated times for different users to move through a location, and alerting users to objects, encroaching vehicles, and other road users.

Washington introduced the Safe System Hierarchy of Controls in 2019, a framework prioritizing policies and countermeasures based on their effectiveness. This structure guides WSDOT in design and operational decision-making, supporting the Complete Streets approach and evaluating roadways using the Level of Traffic Stress (LTS) index, which measures factors like roadway width, speed, and traffic volume. In 2024, the Federal Highway Administration (FHWA) adapted this approach into the Safe System Roadway Design Hierarchy, emphasizing physical changes to the road system to enhance safety.[1]

Safety professionals identify, prioritize, implement, and evaluate safety projects, strategies, and countermeasures on the roadway to encourage safe road use. Self-explaining and self-enforcing roadway designs encourage this safe behavior, reducing the potential for fatal or serious injury crashes.

Roundabouts are a good example of self-explaining designs that reduce exposure to crashes by dramatically decreasing the number and type of road user conflicts; reducing the impact angle of vehicles; lowering drivers' operating speeds in the intersection; guiding traffic from all directions in a circular path; and separating traffic by designating travel lanes. Roundabouts also make crossing distances shorter for those walking and biking. Those designed with a divider between directions at the crossing point enable pedestrians to cross only one vehicle travel direction at a time.


1 See Figure 12 on page 80 and Figure 13 on page 81 for more information.

### ELEMENT 5: SAFER SPEEDS

Reducing driver speeds can support the Safe System Approach in three ways: expanding drivers' field of vision, providing additional time and space for drivers to stop, and reducing impact forces. As speed increases, so does the likelihood of a crash occurring because drivers experience a narrowing of vision, increased response times, and longer stopping distances. Additionally, as the driver's speed increases, all other users who interact with that driver are less able to judge or react.

Planners and engineers communicate target speeds to drivers by selecting and modifying roadway conditions, setting posted speed limits, and designing the look and feel of the roadway's cross section to provide cues for appropriate speeds. Safer speeds are further supported by land use context and communication of regulatory speed limits through signing, driver education, social norms, legal standards, and enforcement. By implementing safe system solutions for safer roads and safer speeds, professionals can reduce both the likelihood that crashes occur and the severity of injury outcomes when they do.

> Increased driver speed dramatically increases the force of a crash.
>
> At 23 mph, 90% of pedestrians will survive a vehicle crash. That drops to a 50% survival rate at 42 mph.
>
> —*USDOT National Roadway Safety Strategy, 2023*

### ELEMENT 6: POST-CRASH CARE

Timely and appropriate emergency medical response to traffic crashes saves lives and reduces the severity of injury outcomes. Nearly 40% of all deaths from roadway crashes did not occur at the crash scene. Many trauma-related deaths are preventable with timely access to effective, organized emergency medical services and trauma care systems. People who are injured in crashes rely on first responders to quickly locate and stabilize their injuries and transport them to medical facilities. Post-crash care also includes forensic analysis at the crash site, traffic incident management, and other activities.