

The experience of traffic safety specialists has shown that it takes a wide variety of efforts to reduce fatalities and serious injuries on roadways; enforcement, engineering, and education are only part of the effort.

To really achieve Target Zero, it will require a concerted effort on many fronts. This includes a robust evaluation of the Target Zero Plan implementation, along with a meaningful analysis of the diagnostics of our traffic safety systems. Improved EMS and trauma systems are another element of the plan.

In addition, local agencies and Tribal governments play a key role in establishing a network of projects, systems, and strategies that will take the Target Zero philosophy and efforts to areas that will have significant impact across our state.

The chapters in this section describe how the state's data, EMS, and locally based implementers improve the entire decision-making process, and bring us closer to Target Zero.

Traffic Data Systems

Washington State's traffic data systems serve as the primary source of knowledge about Washington's transportation environment. The system is a collection of information about crashes, vehicles, drivers, citations, legal outcomes, and injuries. Together, this information helps partners determine how to reduce injuries and fatalities on Washington's roadways.

This information supports Target Zero, a data-driven highway safety plan. Its purpose is to highlight optimum locations to use limited resources of time, talent, and funding to have the most impact.

Traffic data systems support Target Zero by providing quality data needed to:

- Diagnose the contributing factors to crashes.
- Assess the effectiveness of implemented countermeasures.
- Identify innovative and targeted strategies that will have the greatest impact on achieving the goal of zero deaths and zero serious injuries.

In order to help us save lives and prevent injuries, Washington's traffic data systems must be able to provide timely, accurate, integrated, and accessible data. This data is foundational to focusing resources and monitoring progress toward the Target Zero goal.

Overview

The Washington Traffic Records Committee (TRC) is a partnership of federal, state, local, and Tribal stakeholders from the fields of transportation, law enforcement, criminal justice, and health. The statewide TRC was created to foster collaboration and develop projects to improve the state's traffic records system. One example of this is a recent collaboration between the County Road Administration Board (CRAB) and WSDOT to study how their two

unique roadway data systems could share data and create a more seamless experience for their users, who are primarily engineers.

The TRC's mission is to support the state's goal of Target Zero by providing timely, accurate, integrated, and accessible traffic records data. They work to achieve this through four goals:

1. Remove barriers to data sharing and integration.
2. Provide quality data, analysis, and tools to customers.
3. Sustain high levels of collaboration and acquired knowledge within the TRC.
4. Identify and secure targeted investments to sustain TRC initiatives.

Programs and successes

Electronic Ticketing and Collision Reporting Program (eTRIP) integrates ticketing and crash data

eTRIP — a collaboration between WSP, WSDOT, DOL, Washington Administrative Office of the Courts (AOC), the Washington State Association of Sheriffs & Police Chiefs (WASPC) and Washington Technology Solutions (WaTech) — created a seamless and integrated system for electronically gathering and distributing crash reports and traffic tickets, then tracking subsequent activity on those events. This system has been in use since 2007 and currently captures 90% of crashes, and 84% of issued tickets, in Washington State. The system continues to evolve and has recently added tow impound forms. Meanwhile, SECTOR, an electronic ticket and crash reporting application that is part of eTRIP, has added enhanced search features, self-service user registration, and password resets. Eventually, it will include user dashboards with statistical information.



Priority
1

Priority
2

Priority
3

Many systems hold traffic safety data

Washington's traffic information and support data systems are comprised of hardware, software, and accompanying processes that capture, store, transmit, and analyze a variety of data. The following systems makes up Washington's traffic data system:

- Driver (DOL)
- Vehicle (DOL)
- eCitation and eCrash (WSP)
- Crash
 - WSDOT
 - WSP
- Roadway
 - WSDOT
 - CRAB
- Adjudication (AOC)
- Injury surveillance
 - EMS (DOH)
 - Emergency Department (DOH)
 - Hospital data (DOH)
 - Trauma Registry (DOH)

Linking crash and health records to better understand injury severity

State agencies and other traffic safety partners continue to improve data linking and sharing. A dedicated data integration specialist at the WTSC is making significant progress in linking crash records from Washington State law enforcement agencies with hospital records DOH. Ultimately, the goal is to improve the understanding of injury severity for crashes.

Linking local and state roads for better engineering data analysis

WSDOT and CRAB are working to improve the quality, efficiency, and accessibility of systems that support safety engineering improvement decision making:

- WSDOT launched the Crash Data Portal to provide easily accessible crash data reports and maps for state and local engineers, as well static maps for the public.
- CRAB implemented an application, Systemic Safety Project Selection Tool, to help county engineers improve their selection of safety improvement projects based on roadway and crash characteristics.
- WSDOT and CRAB worked together to improve the tracking of changes in intersections, bridges, functional classification, lane width, traffic, and other aspects of the roadway.

Strategies for traffic data systems (TDS)		
Objective	Strategies	Implementation areas
TDS.1. Provide quality data, analysis, and tools to customers	TDS.1.1 Develop new features in SECTOR to address user needs, including additional ticketing options and report types. Expand SECTOR software edit checks to enhance reporting accuracy and consistency. (R, eTRIP GT)	Leadership/Policy, Enforcement
	TDS.1.2 Expand prosecutors' use of SECTOR statewide to create, review, amend, and electronically file criminal cases with the courts. (R, TRC)	Leadership/Policy, Enforcement
	TDS.1.3 Increase the number of electronic tickets and collision reports through expanded adoption and agency-wide implementation of SECTOR. (R, TRC)	Leadership/Policy, Enforcement
	TDS.1.4 Incorporate a GPS-type location component into SECTOR to enhance accurate reporting and integration of location data. (R, TRC)	Leadership/Policy, Enforcement, Engineering
	TDS.1.5 Provide officers with roadside access to driver and vehicle history information through SECTOR. (R, TRC)	Leadership/Policy, Enforcement
	TDS.1.6 Enhance SECTOR functionality to allow violations bureaus (not part of the state JIS system) to electronically process tickets from SECTOR to DOL. (R, TRC)	Leadership/Policy
	TDS.1.7 Make system changes necessary at WSDOT and DOL to enable analysts to identify unlicensed drivers involved in serious injury crashes. (R, DDACTS)	Leadership/Policy
	TDS.1.8 Develop a linear referencing system (LRS) for all public roadways without a LRS to enhance safety analysis. (P, 23 U.S.C. Section 148)	Leadership/Policy
	TDS.1.9 Revise the Police Traffic Collision Report, including both SECTOR and paper reports, to improve nomenclature and ensure business needs are met with stakeholder involvement. (R, TRC)	Leadership/Policy, Enforcement

Strategies for traffic data systems (TDS)		
Objective	Strategies	Implementation areas
TDS.2. Remove barriers to data sharing and integration	TDS.2.1 Derive a more accurate classification of injury severity based on clinical assessments from medical records to augment the investigating officer's assessment of traffic crash injury severity. (P, CODES)	Leadership/Policy, EMS
	TDS.2.2 Enhance the use of the ESSENCE system for using Emergency Department Data to enhance Injury Surveillance capabilities. Increase provider reporting to ESSENCE. (P, CODES)	Leadership/Policy, EMS
	TDS.2.3 Create a central repository for integrated, linked data records including crash records, health (EMS, Trauma, CHARS) records, court records, licensing records, and state toxicology records. (P, CODES)	Leadership/Policy, EMS
	TDS.2.4 Increase EMS reporting by first responders throughout the state to the Washington Emergency Medical Services Information System (WEMSIS). (R, DOH)	Leadership/Policy, EMS
	TDS.2.5 Implement Data-Driven Approaches to Crime and Traffic Safety (DDACTS) model in local law enforcements agencies statewide. (R, DDACTS)	Enforcement
	TDS.2.6 Educate data reporting agencies about state/federal fatal crash timeliness reporting statutes and increase enforcement of these statutes. (P, WTSC)	Leadership/Policy, Education
	TDS.2.7 Create connections for systems with similar or duplicate data to eliminate duplicate entry. (R, TRC)	Leadership/Policy
TDS.3. Sustain high levels of collaboration and acquired knowledge within the TRC	TDS.3.1 Provide more frequent and enhanced traffic safety trend reporting. Present data/trends in a manner that is easy to understand and is actionable. (R, DDACTS)	Leadership/Policy, Education
	TDS.3.2 Maintain a meaningful and valid set of traffic records performance measures to gauge the quality of traffic safety data. Ensure measures are accessible and periodically reviewed. (R, DDACTS)	Leadership/Policy
	TDS.3.3 Support training opportunities to enhance traffic safety data analysis and research skills. (U)	Leadership/Policy
TDS.4. Identify and secure targeted investments to sustain TRC initiatives	TDS.4.1 Create a maintenance and support model for SECTOR and JINDEX that further that improves operations, speeds change request implementation, and enhances user support. (R, eTRIP GT)	Leadership/Policy
P: Proven R: Recommended U: Unknown		

Emergency medical services (EMS) and trauma care system

Key Facts

Nearly 40% of all deaths from trauma — defined as a major injury requiring medical or surgical care to prevent death or permanent disability — occur within hours of injury. The minutes directly following a traumatic injury are often critical to saving lives or minimizing the long-term effects of serious injury.

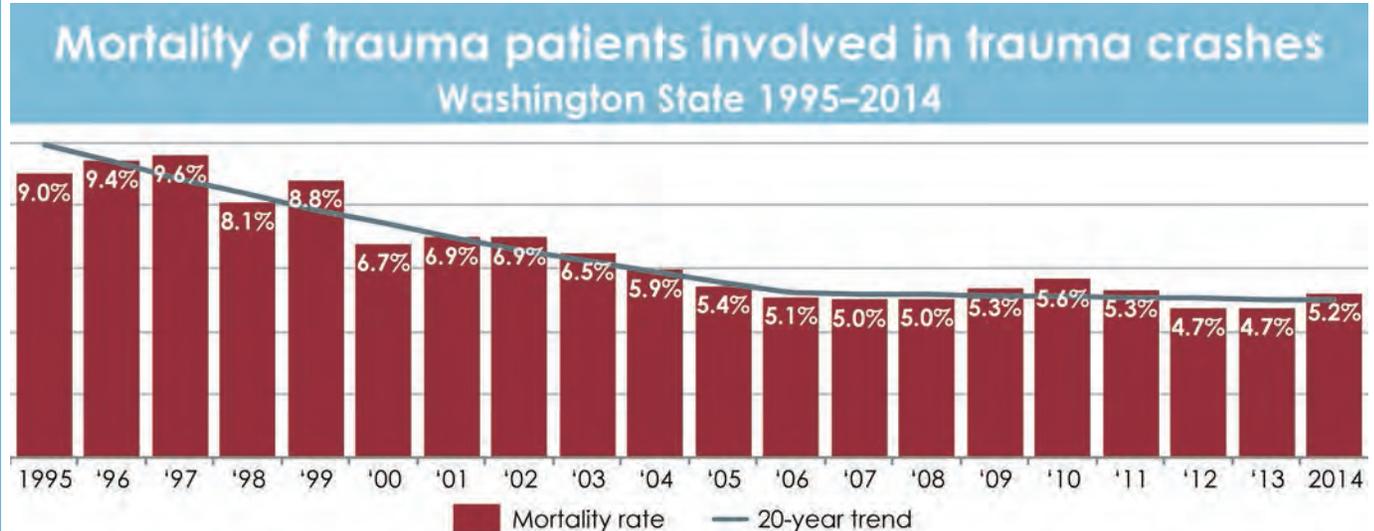
The death rate for trauma patients involved in traffic crashes decreased from 9.0% in 1995 to 5.2% in 2014. The Washington State Department of Health translates this downward trend into about 1,600 additional lives saved by Washington’s EMS and trauma care system over those 20 years.

Unintentional injury is the leading cause of death for young people aged 15–24. In Washington in 2014, about 20% of the 569 deaths in this age group were from motor vehicle crashes.

Washington’s emergency medical services (EMS) and trauma care are part of a coordinated system of ambulance services, hospital-based trauma centers, and other emergency organizations. Together, these responders ensure appropriate care for injured people, with the goal of keeping them alive and able to achieve full recovery. By providing emergency care as quickly as possible, EMS helps reduce deaths and serious injuries in our state, including those from traffic crashes.

Overview

Nearly 40% of all trauma deaths occur within hours of injury. In a national evaluation of the effect of trauma center care on mortality, MacKenzie et al. discussed the importance of triaging severely injured patients to the highest-level trauma center. Their results underscored the fact that overall risk of death is “significantly lower when care is provided in a trauma center than when it is provided in a non-trauma center.” This highlights the importance of a well-coordinated system that ensures severely traumatized patients arrive at the most appropriate level trauma center in the optimum amount of time.



Traffic-related trauma is defined as a major injury requiring medical or surgical care to prevent death or permanent disability. During 1995–2006, as the EMS and trauma care system matured, inpatient deaths caused by traffic-related trauma went down significantly. Since 2007, the rate has stabilized around 5%. Similar trends were evident in most age groups. Since the initiation of the EMS and trauma care system, younger (aged 15–24) and older (aged 65+) groups have had the most significant decreases in hospital deaths.

In addition to the speed of the response immediately following an injury, a patient's outcome also depends on other important facets of trauma care. These include prevention activities, hospital care, and rehabilitation resources. These components work together to reduce the death and disability of injured people throughout Washington.

EMS responders have been able to save more trauma patients involved in vehicle crashes by getting them to the right trauma center faster, where they receive trauma care appropriate for their level of injury. The death rate for trauma patients involved in traffic crashes decreased from 9.0% in 1995 to 5.2% in 2014. The Washington State Department of Health estimates this downward trend represents about 1,600 additional lives saved by Washington's EMS and trauma care system over those 20 years.

Washington's state trauma system saves the life of a car crash victim

Jerry was in a car crash in rural Chelan County, sustaining bone fractures and a traumatic brain injury. Witnesses called the 911 emergency response system. Emergency responders arrived and treated Jerry at the scene, then immediately took him to the closest designated trauma hospital. Doctors there took critical lifesaving steps to treat Jerry, who was bleeding internally and received a massive transfusion.

Jerry was then transferred to the state's highest designated Level I trauma hospital in Seattle, where specialists successfully cared for his additional injuries from the crash. The integrated trauma system that our state has created saved Jerry's life, as well as the lives of many others injured in car crashes.

What's New

Advances in medical equipment have improved patient care. Equipment such as video laryngoscopy, alternative airway devices such as multi-lumen airways, and capnography are all used to assist and monitor patient breathing. Additionally, the use of hydraulic gurneys has improved patient movement.

Smart phone applications and electronic patient care reporting systems have improved the documentation of patient care and data collection.

Innovative programs known as Community Paramedic (or Mobile Integrated Health) are improving how EMS is deployed, ensuring efficient and available EMS resources when traumatic injuries require rapid response, treatment, and ambulance transport.

The recent collection and analysis of rehabilitation data demonstrates that trauma patients who receive inpatient rehabilitation care are more likely to survive and go home with increased functional ability.

Components of Washington State's EMS and trauma care system

- 459 trauma verified pre-hospital (EMS) agencies.
- Eight EMS and trauma regions.
- 82 designated acute care trauma centers.
- 14 trauma rehabilitation centers.

Partnerships are a key component of EMS's success

Washington's EMS and trauma care system have been built upon broad cooperation among a diverse group of health care professionals and industry experts. These groups have continuously worked to address the complex political, economic, logistical, legal, and clinical issues associated with trauma care in the state. Addressing challenges in a collaborative approach allows us to continue reducing the number of crash related fatalities and serious injuries.

Washington State laws relating to the EMS and trauma care system

RCW 18.71 Physicians.

RCW 18.73 Emergency medical care and transportation services.

RCW 70.168 Statewide trauma care system.



Programs and successes

Data on EMS's response to crashes drive the evolution of the program

Using data to develop forward-thinking strategies and make decisions is critical to the continued success of Washington's EMS and trauma care system. When it is fully implemented, the Washington EMS Information System (WEMSIS) will serve as a statewide EMS patient care database to promote evidence-based decision-making, and help evaluate EMS system response and performance.

Currently most of the EMS and trauma care system evaluation relies heavily on patient outcome in the Washington Trauma Registry (WTR). The WTR collects demographic and clinical data on trauma patients from pre-hospital agencies and trauma-designated acute care services.

These two databases will ensure that EMS realizes its full potential and continues to favorably impact the outcomes of injured people. They will help with the evaluation of:

1. The amount of time the patient remains on the scene after the arrival of EMS (on-scene time).
2. Whether the patient was transported to the appropriate level of trauma hospital (patient destination).
3. Whether the patient survived (patient outcome).

Together, the data in WEMESIS and WTR capture a comprehensive picture of EMS and hospital care received by trauma patients. The state's Traffic Records Committee is exploring linking data from the WEMESIS and the WTR, as well as hospital inpatient discharge records, with crash records. Linking these datasets will provide insights on how to best deliver care to those severely injured in crashes.

Two more data advances round out this work. First, EMS organizations have also implemented a new version of data collection software (Collector V5) which allows more accurate data. Second, new trauma registry software has improved the collection of data surrounding the point of injury, including place of injury, location, Mechanism of Injury (MOI), protective devices, outcomes, and Quality Improvement (QI).

Working together, these data systems will improve our understanding of crash-related trauma in our state, and improve our decision-making.



Strategies for EMS and trauma services (EMS)		
Objective	Strategies	Implementation areas
EMS.1. Reduce injury deaths and hospitalizations through EMS response and access to trauma care	EMS.1.1 Ensure efficient and adequate distribution of Level 1 and Level 2 Designated Trauma Centers. Increase the number of Level 2 Trauma Centers in the state. (P, META).	EMS
	EMS.1.2 Ensure that all major trauma patients are transported to the highest appropriate level of designated trauma center within a 30-minute transport. (R, DOH)	EMS
	EMS.1.3 Identify funding strategies that assist air medical services in filling gaps in coverage for emergency air medical response as identified in the state EMS and Trauma System Plan. (R, DOH)	Leadership/Policy, EMS
	EMS.1.4 Increase injury prevention programs that reduce traffic related injuries and death. (R, LIT)	Education
	EMS.1.5 Increase the percentage of EMS on-scene arrival responses that are within state requirements. (R, DOH)	EMS
	EMS.1.6 Ensure adequate and efficient distribution of pre-hospital EMS resources at all levels (aid and ambulance) according to the EMS and Trauma State and Regional Plans. (R, DOH)	Leadership/Policy, EMS
	EMS.1.7 Improve enforcement and public understanding of "move-over" law. (U)	Education, Enforcement
	EMS.1.8 Consider EMS access in engineering development plans. (U)	EMS, Engineering
EMS.2. Increase communication and data capacity	EMS.2.1 Enable seamless communications capabilities among EMS, law enforcement, and fire services agencies through interoperability. (R, NCHRP)	EMS, Enforcement, Leadership/Policy
	EMS.2.2 Ensure that the Washington State EMS and Trauma Care System (WEMSIS) has a statewide comprehensive, robust pre-hospital data system utilizing a data set with standard definitions. (R, NCHRP)	Leadership/Policy, EMS
	EMS.2.3 Increase the number of EMS agencies reporting to WEMSIS. (R, NCHRP)	Leadership/Policy, EMS
	EMS.2.4 Provide WEMSIS data for linking to collision records. (R, DOH)	Leadership/Policy, EMS
	EMS.2.5 Ensure that the Washington State EMS and Trauma Care System collects, integrates, links, and analyzes data from all system components. (R, DOH)	EMS
P: Proven R: Recommended U: Unknown		



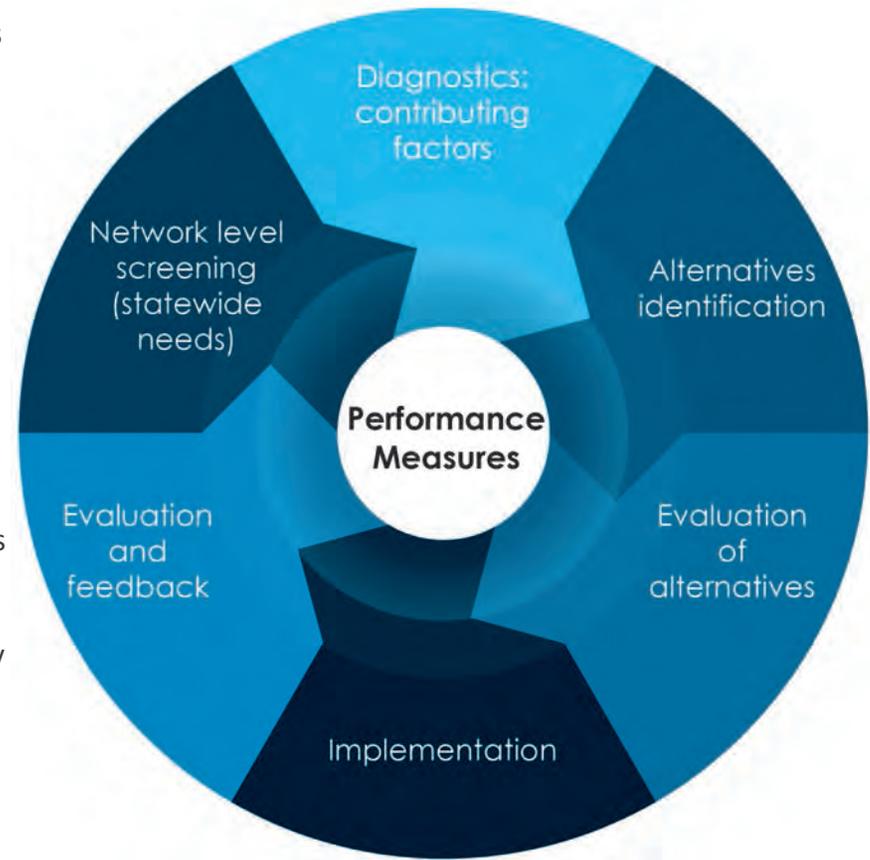
Evaluation, analysis, and diagnosis

In Target Zero, evaluation, analysis, and diagnosis is a critical component of success in reducing traffic deaths and injuries, helping us to make decisions that affect engineering, enforcement, education, and EMS. This work is the "fifth E" of highway safety.

Rather than relying on perceptions or anecdotal evidence to make these decisions, Target Zero requires a data-driven and targeted approach. This approach allows us to identify measures, target investments, track performance, and determine the impacts of our efforts. Target Zero's partners use this information to increase the return on our investments, improving the likelihood of achieving our goal of zero fatalities and serious injuries.

Target Zero is the state's strategic highway safety plan. It focuses attention on reducing fatalities and serious injuries. Target Zero serves as the basis for building both Washington State's Highway Safety Plan and the Highways Safety Improvement Program (HSIP). Fatality and serious injury targets in Washington State are being handled by the WTSC via the Highway Safety Plan and by WSDOT through the HSIP. Target-setting work is also underway with the state's metropolitan planning organizations (MPOs).

Local agency and WSDOT projects to address Target Zero priorities are selected and ranked for HSIP funding. HSIP projects addressing Target Zero priorities are then included in the Statewide Transportation Improvement Program.



Target Zero uses data to measure performance

Target Zero measures what we want to change: the number of traffic fatalities and serious injuries. Measuring helps us understand how well programs or projects are doing in achieving the intended results. In this case, we ultimately want to reduce fatal and serious injuries to zero by 2030. When all our partners use the same measures, we are able to set priorities and identify strategies that are targeted toward this common goal. We use these same measures to track performance over time, and to provide accountability to the public we serve. We also set targets so we can determine what constitutes progress.

Evaluation: looking at the big picture

We start with a system-level evaluation of Washington's roads, looking at large amounts of traffic safety data. We begin by evaluating our performance at the system level — all fatalities and serious injuries, across all roads in the state — to get a big picture look at how we are doing.

Safety practice often focuses in three areas:

- The vehicle, such as operation and restraint systems.
- The driver, such as user capability and user behavior.
- The environment, such as the road system roadway conditions and weather.

These three areas allow for the development of high-level categories. In Washington, we have chosen to focus on how aspects of the vehicle, driver, and environment contribute to the serious and fatal injury crash and severity outcomes. We call these the contributing factors to crashes, and we look for the ones that are higher than we would expect.

Factors include behavior such as impairment and distraction, or crash types such as intersection or lane departure crashes, or road system issues such as congestion or speed differential between road users.

These factors help us to develop meaningful categories of data, evaluate them to determine the magnitude and nature of these outcomes, and ultimately to set priority areas (see table on page

Definitions for evaluation, analysis, and diagnosis of traffic safety

	Definition	Example
Evaluation	Assess the big picture or categories of data to evaluate performance against a pre-determined set of criteria. For Target Zero, this means looking at whether or not we met targets for traffic-related fatalities and serious injuries within our priority areas. Each agency may set individual targets or criteria that would indicate a need to take some action. If a location or factor is not meeting expectations, it is identified for analysis.	We find that a specific roadway has more crashes at intersections than we would expect for similar roads.
Analysis	Study the location of factor in depth, using different means or methods in order to interpret the data and understand why a factor or location is particularly high. For instance, using crash statistics to help us understand why crashes are reducing, staying the same, or increasing.	We analyze the data to determine that the majority of those crashes are related to impaired driving.
Diagnosis	Identify contributing factors or root cause leading to an increase or decrease in crashes, similar to the way that a doctor diagnoses a patient for the root cause of her symptoms. Done well, diagnostics help us understand the factors leading to a crash or series of crashes.	We diagnose that the problem is coming from numerous drinking establishments in a very localized area, with two locations in particular that are known to overserve.

Our countermeasures come from national sources

We have several tools for evaluating countermeasures and their potential to reduce crashes. These are referred to as crash modification factors (CMFs) and are used to project the potential outcomes and to compare countermeasure effectiveness for engineering in the [Crash Modification Clearinghouse](#), or behavioral issues in [Countermeasures that Work](#).

11). This information is used to identify statewide, region-specific, or even corridor- or location-specific priorities for interventions to improve traffic safety performance.

For instance, we have high-visibility enforcement (HVE) programs that focus on corridors with many distracted driving and impaired driving crashes. We have engineering programs to place curve warning signs at sharp curve locations to reduce run off road crashes. Finally, we use education programs to teach safe crossing skills to young pedestrians, as well as driver safety education courses for new drivers and chronically high-risk drivers.

Having concentrated our data to these priority areas, we can then evaluate trends in the data. Trends help us to understand whether types of crashes are reducing, staying the same, or increasing. This matters because, as described above, we develop projects and programs to address priorities, and as stewards of the system we want to understand whether our interventions are effective.

Analysis: understanding why a factor or location has a high number of serious and fatal crashes

Analysis involves understanding why a factor or location has a higher-than-expected rate of serious and fatal crashes. The network screening process can identify regions, corridors, or locations that would benefit from a specific countermeasure. Network screening generally establishes a specific level that would constitute a need. For example, WSDOT might look for locations where head-on injury crashes are greater than the injury average of other, similar highways, to identify locations for cable barrier. The Washington State Patrol might identify locations based on the percentage of speed in excess of ten miles per hour to perform an emphasis patrol. The Department of Licensing might identify total DUI arrests that are related to a particular location over-serving alcohol.

One of the key tools for analysis is the Highway Safety Manual (HSM), a national document from the American Association of State Highway Transportation Officials. The HSM provides tools and knowledge for quantifying safety in decision-making. With this tool, transportation professionals can consider the impacts on safety across the full range of highway activities: planning, programming, project development, construction, operations and maintenance. It is updated periodically to incorporate new developments in safety.

One example of analysis in action is the recent Marijuana Study by the WTSC. In response to the legalization of marijuana in Washington State, the WTSC partnered with the WSP Toxicology Lab to examine detailed toxicology results on drivers involved in fatal crashes. Although the FARS database collects information on drug results from toxicology testing, the existing data does not distinguish between delta-9 THC (the psychoactive substance shown to cause driver impairment) and the inactive metabolite of marijuana, which may be detected in the body for up to 30 days. This detailed marijuana information was combined with the existing detailed FARS information to create a one-of-a-kind data set that is currently being used to analyze and monitor the impact of legalized marijuana in Washington State.

Diagnosis: digging deeper into the data

Diagnosis focuses on the contributing factors or root causes of a crash, types of crashes, or the factors that are common in a series of crashes. This requires a more thorough and detailed review than the analysis, so that partners can make good decisions about how to address traffic safety concerns.

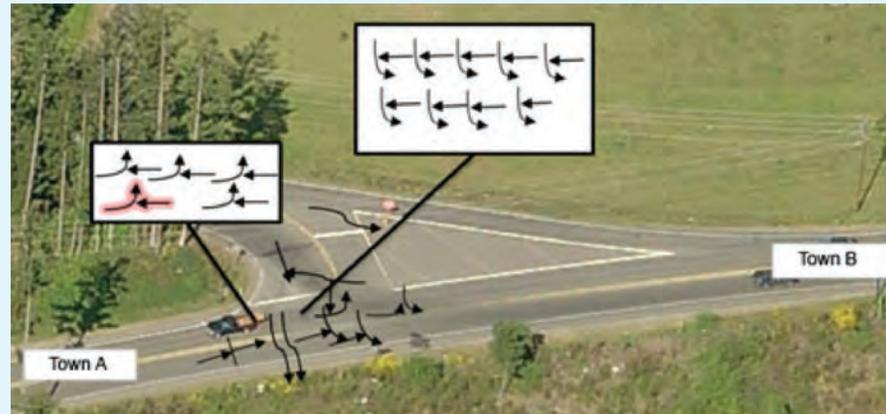
Good decision-making begins with an understanding of:

- What constitutes a safety concern?
- What we can do to address those concerns?
- What is causing or contributing to the concern in the first place? This is the most important aspect of good decision-making.

Why is diagnosis important? As an example, a doctor does not give a prescription without first understanding the symptoms and conditions that the patient is experiencing, and how these are different from normal expectations for health. Similarly, when we analyze the roadway, we first need to understand what is contributing to the crash risk, and whether or not the level of risk is in excess of what would be expected for that type of roadway. For instance, we will expect different crash numbers and types for a busy interstate highway with high speed and no pedestrians, compared to those of a quiet residential street with low speeds and many pedestrians.

Diagnostics involve a high level of detail to find crash patterns

This crash diagram and data table are examples of the level of detail involved in diagnosis.



Five years of crash data

First crash type	
Entering at angle	14
Left turn opposite direction	5
Run off the road	3
Rear end	1

Crash injury severity	
Fatal injury crash	1
Serious injury crash	2
Evident injury crash	4
Possible injury crash	5
Property damage only crash	11

Contributing circumstances	
Did not grant right of way to vehicle	12
Disregarded STOP sign	5
Exceeded reasonable safe speed	2
Improper turn	1
Inattention	2
Impaired by alcohol	1

Diagnostics show us the best interventions

The diagnostics guide us in our interventions. For example, if the primary contributing factor to a crash is speeding, and through our analysis we have found that a high frequency of speeding is occurring during late Friday and Saturday nights, then an enforcement campaign that targets excessive speed at those times would be more effective than an engineering solution that modifies the highway for all drivers at all times. On the other hand, if we were to see excessive speed in a residential area, and we also knew that the road was designed for higher speeds and mid-20th-century land use, then permanent traffic calming devices like a traffic circle might be appropriate.

We can also select multiple countermeasures when primary and secondary contributing factors indicate that collectively they will benefit a particular location or factor. Washington is a pioneer and national leader in a partnership style that promotes collaboration among experts from many fields and levels of government in order to achieve the optimal solutions to highway safety issues. Our state's highway safety programs often include the coordinated use of enforcement, education, engineering, and EMS.

Having diagnosed the primary contributing factors across each of the areas (human, vehicle, and environment) for a given area, corridor, or spot location, we are then able to identify countermeasures or interventions that will be most effective in addressing these crash contributing factors.

Using our data to improve highway safety

Having diagnosed the contributing factors and crash types involved in fatality and serious injury crashes, our next step is to develop approaches to address the crash outcomes. Whether referred to as alternatives, countermeasures, or interventions, the intent is to reduce fatal and serious injury crashes. We do this by cost-effectively selecting a series of actions to address the contributing factors that lead to crashes.

Our approach to evaluation will evolve as our technical abilities and our challenges change

What we know about the science of highway safety continues to evolve, as does our knowledge of projects and programs to address safety. It is important that we evaluate and then adjust for both the positive and negative results we see. We will not improve, and we will not achieve our Target Zero goal, if we don't address the interventions that have resulted in less-than-successful outcomes.

In the past, we evaluated highway safety performance in terms of lagging data: data that represents the past experience. For example, the safety performance of an intersection used to be based solely on reported crashes over a very short time frame. A location that experienced multiple crashes over this short time would be given priority over one that might be experiencing a more consistent and higher longer term trend, but had fewer crashes during the peak couple of years when we made project or program selections. This type of approach results in locations receiving funding and interventions that aren't going to have a major effect: if nothing had been done at that location, the crashes would have reduced anyway because they were random events. Statistically, this is called regression to the mean, but from a practitioner's perspective, this means that the crash reduction benefits of an intervention based on past approaches may not be the best use of our limited resources.

Target Zero partners are working to analyze potential projects to increase the certainty of project selection by using more comprehensive analysis techniques and by using rigorous analysis methods in research and detailed analysis. For example, WSDOT is using The Highway Safety Manual and its associated tools to predict crashes given the characteristics of a highway. These tools use safety performance function and crash modification factors to determine the potential change in crash frequency or severity for the implementation of a given road change. They are very helpful in making decisions related to different alternatives. (AASHTO, 2010).

In addition, Washington's success in reducing fatalities has also brought a new challenge. As fatal and serious injury crashes occur further apart in time and less densely at particular locations or corridors, it becomes increasingly more difficult to identify patterns and specific locations with some level of certainty. Systemic, risk-based approaches such as predictive models, which focus on expected trends based on similar roadways, are necessary to overcome this challenge. WTSC and WSDOT have used these approaches successfully since the mid-1990s, and will continue to build on them for future analysis.

Choosing cost-effective safety investments that benefit the whole system

The value of safety investments must be considered at both the local and system levels. This is important because high costs on one project or program may prevent us from doing other projects and programs. For example, spending \$40 million to build an interchange at a single location, when a \$3 million roundabout would reduce the same amount of crashes, would not provide greater benefit for that location, and would in fact detract from improvements on the entire system. If we build the \$40 million interchange, then we forgo \$37 million in safety investments that we could have used to target other parts of the system.

Expanding the evaluation, analysis, and diagnostic skills of Target Zero staff

To be most effective in the evaluation, analysis, and diagnosis of crash reduction opportunities, Target Zero partners must provide training and specialized staff members. We need this skilled workforce to provide services in the overlapping and increasingly complex field of highway safety education, enforcement, engineering, and EMS. Staff such as statisticians, epidemiologists, human factors experts, and roadway safety engineers are required to keep up with increasingly analytical and technical needs.

Making the data meaningful and useable for partners as our approaches evolve

With a more proactive, predictive, risk-based approach comes the need for data to be more integrated and accessible to users. Many Target Zero partners use information to identify and address their current safety business needs. In the past, organizations were able to develop effective programs and projects using their own data. Now, the need to develop collaborative approaches provides the opportunity for us to bring many different data sets, layers of GIS information, and multidisciplinary approaches to a single location.

In 2012, the federal MAP-21 legislation directed FHWA and NHTSA to require state and local safety partners to work collaboratively in the development and implementation of the Strategic Highway Safety Plans, such as Washington's Target Zero. MAP-21 requires federally funded state programs to develop a more integrated, multidisciplinary, and multiagency safety program, across different modes of transportation.

Local Agencies and Target Zero

Washington's continued progress toward our goal of zero traffic deaths and serious injuries is due in large part to the critical work being done by local agencies and organizations who help both write and implement the state's Target Zero plan.

Local data drives local investments

The Target Zero work accomplished by local partners is most effective when it is guided by robust data sources. The data presented in Target Zero is aggregated at the statewide level, but can also be broken down by county — as seen in several maps throughout the plan — or even at the city or smaller level. This data can be very useful for prioritizing resources and programs at the county level, using the same data-driven approach as with statewide programs.

An important component of the Target Zero plan is that the information highlights which factors are contributing locally to the most fatalities and serious injuries. The most common factors in one county or city might be very different from another, requiring different intervention strategies.

Target Zero analysts update this information regularly on the [Research and Data page](#) of the Washington Traffic Safety Commission website. It can be found at the [WSDOT Crash Portal](#).

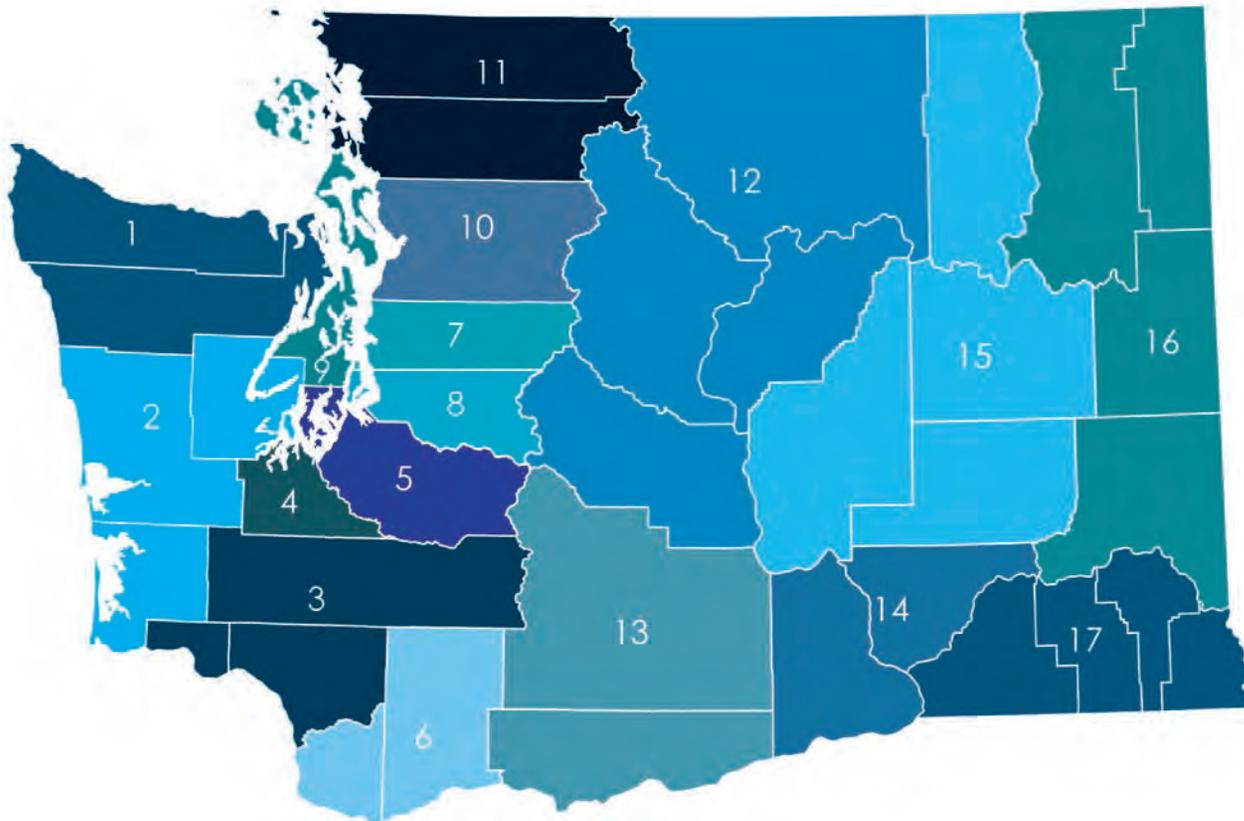
This community-specific data helps local and regional agencies prioritize their traffic safety projects and programs, and also assists in developing localized Target Zero plans. A data-driven approach to problem identification and prioritization can provide local-level justification for allocating funds and resources.

Further, local priorities can vary significantly from statewide priorities, based on the data.

Target Zero managers guide local efforts

Washington State is known for strong state and local partnerships in traffic safety efforts. For over 30 years, our state has invested in a coordinated network of local traffic safety professionals. This network has evolved over time as the traffic safety picture has changed at the local, state, and national levels.

Today, we have Target Zero managers (TZMs) to guide local task forces around many counties and Tribal reservations in the state. These task forces are ideally composed of engineering, enforcement, education, and emergency medical services (EMS) experts, as well as other community agencies and organizations with an interest in traffic safety. The TZMs and task forces coordinate local traffic safety efforts and resources by tracking data, trends, and issues in their area. They develop and provide a variety of traffic safety programs, services, and public outreach throughout their communities by working with local partners.



Counties and regions with an assigned Target Zero manager (TZM)

WTSC and WSDOT have highway safety funds for local organizations

Funding is available for local governments and organizations through four statewide grant programs, one from WTSC and three from WSDOT. The WTSC Federal Grant process funds behavioral change projects, and local data helps determine priority areas for funding grant requests each year. Meanwhile, WSDOT's federal Highway Safety Improvement Program (HSIP) program awards funding for local traffic safety engineering improvements and the Bicycle, Pedestrian, and Safe Routes to School programs.

Local representation on the WTSC

City and county government representatives are an important part of our state's traffic safety effort. The Governor appoints a member of the Washington State Association of Counties (WSAC), the Association of Washington Cities (AWC), and a local judge to the Washington Traffic Safety Commission so they can work with state agency directors involved in traffic safety. The WTSC commissioners oversee and approve the grant funding recommendations of WTSC staff.

Local program examples

King County distracted driving campaigns

King County Task Force addresses distracted driving throughout the county

The King County Target Zero Task Force received federal grant funding from the WTSC to conduct public outreach and high visibility enforcement (HVE) campaigns to reduce and prevent distracted driving. The Task Force represents multiple King County agencies. Starting in 2012, the task force implemented the project with early- and late-summer campaigns across the county in order to reach motorists during peak driving periods, specifically the end and start of the school year and summer holidays. During the campaigns, task force members patrolled hundreds of extra hours and contacted thousands of violators. In 2014, the Task Force's work accounted for:

- 1,281 contacts
- 1,086 citations
- 390 citations for phone usage
- 152 citations for texting or other electronic device usage

In 2015, the task force continued the project with two emphasis patrols.

Washington State Patrol (WSP)'s county-wide and city distracted driving initiatives

To help reduce crashes in King County, WSP has developed a comprehensive plan that captures five years of fatalities and serious injury data on state highways and freeways in the county. In 2013 alone, WSP investigated 18 fatal crashes and 2,149 injury crashes in King County; distracted driving was cited as a key factor in many of these cases.

From this analysis came the King County Target Enforcement Area (TEA) Deployment, a comprehensive plan that addresses serious injury and fatality crashes on all of the King County interstate and state routes for which the WSP has responsibility. The data in the plan shows locations that have had a high incident of fatality and serious injury crashes.

Additionally, with funding from King County EMS, WSP conducted city-specific patrol projects to address areas of high need. Local partners and crash data identified a cluster of fatal and serious injury crashes in Kirkland on I-405 between mile post 20 and 22. In October 2014, troopers targeted the area for a five-day period with teams of five to seven troopers per shift. Troopers made contact with 259 drivers during this time, resulting in:

- 102 arrests (including outstanding warrants, etc.)
- 61 phone violations
- 53 warnings
- 43 moving violations

Those projects were planned in cooperation with the Task Force. The teams partnered on media, outreach, and officer recruitment, among other elements. In previous years, WSP has also conducted city-specific patrols in SeaTac, Kirkland, and Redmond.

Full-time DUI patrols in Spokane and Yakima reduce impaired driving

The Washington State Patrol operates Target Zero Team programs in King, Pierce, Snohomish, Yakima, and Spokane counties. This program supports impaired driving patrols by teams of dedicated, full-time DUI troopers.

In Yakima and Spokane counties, regional TZMs coordinate with local and county law enforcement agencies, and the Washington Liquor and Cannabis Board (WLCB), to supplement these efforts to reduce impaired driving. These efforts include:

- Conducting impaired driving high visibility enforcement campaigns.
- Alcohol retailer compliance checks
- Increased public outreach regarding impaired driving.

In coming years, Pierce, King, and Snohomish will pursue this work as well.

Coordinated high visibility enforcement (HVE) campaigns target dangerous behaviors

An important focus of the Target Zero manager (TZM) network is coordination of a number of statewide high visibility DUI, distracted driving, and seatbelt traffic safety campaigns. Deterrence is the main goal of the HVE campaigns, but enforcement of the laws also plays an important role. These campaigns are unique as multiple agencies often cross jurisdictional lines to collaborate for the enforcement patrols.

First, TZMs educate the public about the traffic safety issue and upcoming emphasis patrols through media campaigns. They then coordinate multiple agencies to create a broadened enforcement presence on the roads during the campaign. TZMs work with city and Tribal police departments, county sheriffs' offices, and WSP to plan and schedule patrols in high-risk areas and times identified by local crash data.

Local EMS and trauma services support enforcement and prevention efforts

Local EMS and trauma services programs play a significant role in enforcement and prevention efforts around the state, guided by the eight EMS and Trauma Regional Councils statewide. EMS participates in programs such as the Safe Kids project, recommending and funding injury prevention efforts. EMS also provides an important liaison between law enforcement agencies and Regional EMS and Trauma Care Councils, local hospitals, and fire departments, working to bridge the gap on issues that affect these professions. In King County, EMS has provided funding to local agencies and WSP for distracted driving prevention projects since 2012.

Several Washington State cities are adopting Vision Zero

Vision Zero began in Sweden in the late 1990s, and helped inspire Washington State's Target Zero plan. This zero traffic fatality initiative has led to Sweden having one of the lowest highway fatality rates in the world.

The core values of Vision Zero are:

- All traffic deaths and severe injuries are preventable.
- No loss of life is acceptable.
- We are human and make mistakes.
- The road system must be designed to protect us at every turn.
- Safe mobility is a basic right for all people.

In the past five years, advocates around the United States have promoted Vision Zero at the local level. Washington State has an active Vision Zero movement in several cities:

- Seattle has adopted a Vision Zero plan.
- Bellevue has adopted a Vision Zero resolution by City Council.
- Kirkland and Tacoma have Vision Zero policies in their Transportation Master Plans.
- Kirkland also has Vision Zero policy language in its Comprehensive Plan.
- Seattle and Kenmore both have developed Vision Zero programming.

Target Zero and Vision Zero Plans in Washington State

Developing local Target Zero or Vision Zero plans can be an effective way to expand partnerships with area agencies and develop a common vision. These local plans create priorities and strategies based on community-specific fatality and serious injury data.

Many cities and counties around Washington have adopted "zero fatality" and "zero fatality and serious injury" plans, including Bellevue, Kenmore, Kirkland, Seattle, and Tacoma. Target Zero managers are available to help with work on the local level.

Seattle's Vision Zero program had a recent success with their NE 75th Street Road Safety Corridor Project. This rapidly implemented project — which was designed and put into place in six months — achieved notable results for traffic safety:

- Crashes reduced by 45%.
- Speeds reduced 9% eastbound and 11% westbound.
- Top-end speeders (10+ mph over the posted speed limit) reduced 75% eastbound and 79% westbound.
- Travel times unchanged.

In addition, as with Washington State's Target Zero plan, Vision Zero has a core value to promote partnerships. The Vision Zero movement is a complementary effort to the state and local outreach of Target Zero, which has been mainly focused at the state, county, and Tribal levels in Washington. These two movements will be coordinating in coming years, united by a goal of reducing traffic fatalities and serious injuries to zero in Washington State.