

II. Improvement

Highway Safety

Highway Safety investments are intended to reduce and prevent serious traffic injuries, the frequency and severity of disabling injuries, and the societal costs of accidents. Consequently, safety projects on Washington State highways have two primary focuses:

- The Accident Reduction approach has two elements; A spot locations approach, and corridor sections approach. Each addresses sections of highway greater than one mile in length.
- Accident Prevention addresses locations with a high risk of collision occurrence. This program allows WSDOT to address potentially hazardous situations before they become a problem.

While all highway capital projects address motorist safety, a targeted safety improvement program is also required to address highway safety needs on routes without other planned improvements.

Data relating to collisions on the state highway system:

- 2004 fatalities
- 2004 disabling injury accidents
- 2003 fatalities
- 2003 disabling injury accidents

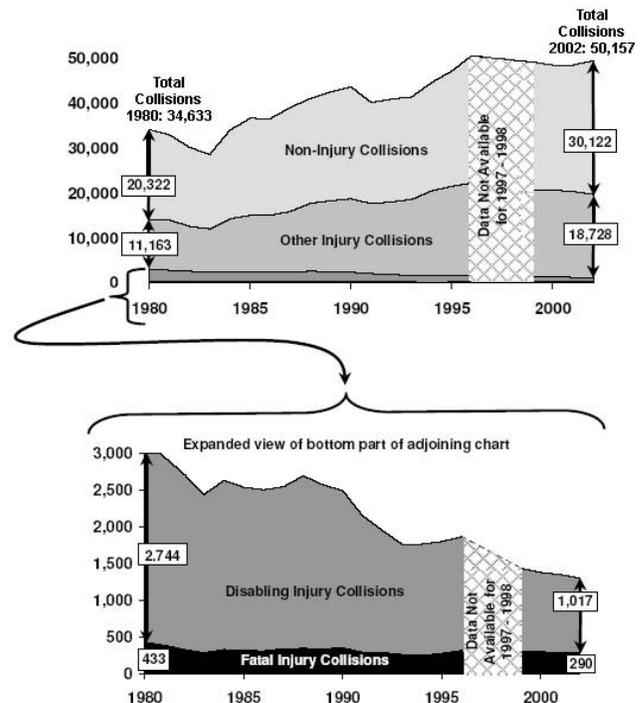
Fatal collisions are only a small fraction of all accidents on our roadways. WSDOT's data shows that the sum of all collisions on Washington State highways grew from 34,662 in 1980 to 50,157 in 2002. This is an overall increase of 45 percent. However, Vehicle Miles Traveled (VMT) over the same period increased by 88 percent. So despite the fact that the volume of collisions grew, that growth was relatively less than the growth of VMT.

Source: <http://www.wsdot.wa.gov/planning/wtp/datalibrary/Safety/MVCollisions.htm>

Source: <http://www.wsdot.wa.gov/planning/wtp/datalibrary/Safety/MVCsocietalcost.htm>

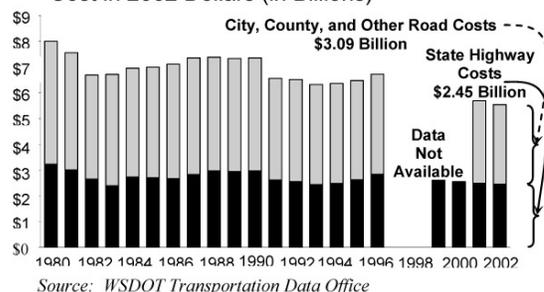
CHART SHOWING SOCIETAL COST HISTORY

The total number of collisions – all types – has increased



Societal costs of motor vehicle collisions

Societal Costs of Motor Vehicle Collisions in Washington State 1980 – 2002
Cost in 2002 Dollars (in Billions)



Source: WSDOT Transportation Data Office

Cost factors are used to identify deficiencies based on past collision history and enable us to calculate future benefits of proposed improvements.

The source of these cost factors is the Federal Highway Administration's (FHWA) Technical Summary "The Cost of Highway Crashes", Publication No. FHWA-RD-91-005. This research was conducted to develop a set of comprehensive costs that people are willing to pay to avoid pain and lost quality of life. Cost factors

were developed, and are periodically updated on both a per person and per collision basis.

Any cost factors used to identify deficiencies and establish priorities should be on a per collision basis. To prevent the factor of fatal collisions from excessively influencing the priority selection process, and recognizing that the difference between a fatal and a disabling injury collision is often relatively minor, WSDOT's traffic safety personnel recommend that a weighted Fatal/disabling injury collision cost factor be utilized.

Periodically, these factors will be adjusted as appropriate, or upon the development of new cost factors by FHWA.

Needs

The following are representative needs found on the State Highway system:

- Extend on and off-ramps to the interstate, remove fixed objects, and flatten slopes on the side of the freeway.
- Reduce risk and improve safety by removing fixed objects, flattening roadside slopes, improving horizontal and vertical stopping sight distance, and widening roadways .
- Implement specific low-cost features statewide to reduce accidents and their severity.
- Provide and maintain a safety rest stop every 60 miles throughout the state highway system. Drivers benefit from reduced accidents due to inattention or sleepiness.
- Improve At Grade Intersections and reduce the potential for serious accidents as the volume of mainline and crossroad traffic increases.
- Identify intersection Improvements where traffic volumes are growing and/or minor accidents are beginning to occur.
- Identify Pedestrian Risk locations where pedestrians are at higher risk including around schools, senior centers, and transit facilities.
- Identify corridors with geometric and roadside elements contributing to accident probability and increased accident severity.
- Include safe connections and convenient access to pedestrian and bicycle facilities (bicycles covered-parking facilities, racks,

etc.) at transit centers, transit stops, airports, rail terminals, ferry terminals and park & ride lots.

- Modifying roadways to include paved shoulders or bicycles lanes, sidewalks, and safe crossings with a focus on known accident locations.
- Creating new, and maintaining existing corridors for bicycles and pedestrian transportation purposes.

Another way of finding location specific data on fatal and disabling accidents is to compare urban roadways to rural roadways (regardless of the level of government that owns the road). Roadways are classified as either urban or rural based on a federal designation of "urban areas," established by the population density of an area. "Urban Areas" are highlighted in the map below.

Accidents and Rates by County and System

map here

Strategies

Strategies for reducing and preventing injury collisions

Approaches for improving highway safety continue to evolve. The traditional approach is to reconstruct highways to meet current design standards. While rebuilding roadways to design standards will reduce the risk of collisions, this approach can be very costly, particularly impacts to property or environmentally sensitive areas as a result of the improvement.

Making large investments at spot locations results in fewer locations being addressed and limits the public benefit of improvements.

Therefore, the preferred approach to improving highway safety is investing in improvements that are rela-

tively low cost per site/mile and provide significant reductions in the risk of serious collisions.

A systematic approach to bringing highways up to standards provides the public safer highways at a lower cost..

- Collision Reduction Priorities
 - Spot locations on the highway system with higher than average collision rates
 - Corridor sections on the State Highway System with higher than average collision rates.
- Collision Prevention addresses locations exhibiting a higher risk of collision occurrence and include the following focus areas: Interstate Safety, Risk Reduction, At Grade Intersection, Intersection Improvements, Pedestrian Risk, and Special Safety Initiative. This program allows WSDOT to address potentially hazardous situations before they become a problem.
 - Identify corridors with geometric and roadside elements that contribute to accident probability and increased accident severity.
 - Identify improved signalization and channelization opportunities to reduce collision risk.
 - Identify at-grade intersections in high-speed multi-lane divided highway intersections exhibiting high accident potential.

Providing a basic level of safety on all state highways

List items

The primary strategies for increasing biking and walking while making it safer includes:

- Maximizing funding for safety needs through partnerships.
- Raising awareness of bicycle and pedestrian safety needs.
- Sharing information on bicycles and pedestrian issues between Washington's agencies, jurisdictions, and organizations.

Prioritization arrays for each of these project types can be found in the table on the previous page.

Interstate Safety

WSDOT and the Federal Highway Administration (FHWA) agreed to create a strategy to identify non-standard features on the Interstate System and initiate a program to bring them up to standards.

In the past, these projects were not prioritized but imbedded in roadway preservation projects already programmed. The amount of work programmed within a biennium is limited to funds available for this purpose (for the 2005-07 budget - \$16 million).

Research is currently underway to develop a more strategic approach than investing in standards upgrades on the interstate system. The results are expected to be available for development of the 2009-11 budget.

Risk Reduction

Identify locations where few accidents have occurred but the potential for accidents is above average due to traffic volumes and non-standard features on the roadway and roadside.

These projects are prioritized based on the number of potential accidents eliminated and the cost of the proposed project.

Special Safety Initiatives

Special Safety Initiatives focuses on specific low-cost features that can be implemented statewide to reduce accidents and their severity. These initiatives include:

- Install shoulder rumble strips, or stripes on rural multi-lane highways to alert sleepy drivers.
- Replace non-standard guardrail installed prior to 1970.
- Installation of three-beam guardrail to strengthen non-standard bridge rails built before 1968.
- Install median cross-over protection on medians narrower than 50 feet wide to prevent vehicles from driving through.
- Install centerline rumble strips on two lane rural highways.
- Implement re-directional Landform Mitigation.
- Add passing lanes as a safety strategy on two lane rural highways
- Protect Re-directional Land Forms

These projects are prioritized two ways; either by the forecasted number of accidents eliminated and the cost of the proposed project or by the number and severity of accidents anticipated to be eliminated compared to the cost of the proposed project. The methodology used varies depending on the type of project

New Rest Areas

WSDOT strives to provide a safety rest stop every 60 miles throughout the state highway system. The Legislature requires that the department develop a partnership with another organization in order to build a new rest area.

The priorities in this category are determined by the cost effectiveness of serving an anticipated number of rest area users, including the benefits of reduced accidents due to the inattention or sleepiness, and includes the construction, operation, and maintenance costs of the facility.

Safety Rest Areas

Quick Facts:

- Statewide, the Washington State Department of Transportation (WSDOT) owns and operates 43 safety rest area facilities.
- The purpose of safety rest areas is to give fatigued drivers a safe place to stop and rest.
- The annual maintenance cost for state rest areas is over \$4 million. This includes:
 - Facility maintenance
 - Landscape maintenance
 - Trash disposal
 - Utilities (electric, water, sewer)
- Parking is allowed in state rest areas for up to eight hours, unless otherwise posted. Hours are limited to prevent rest areas from being used as campsites.

Designed with the traveler in mind

Most safety rest area facilities provide these amenities:

- Restrooms designed to meet the Americans with Disabilities Act standards
- Picnic tables
- RV dump stations - available at 19 of the 43 rest areas
- Designated pet areas for leashed animals

- Pay telephones
- Snack machines
- Motorist information - restaurants, hotels/motels, gas, local attractions

Source: <http://www.wsdot.wa.gov/traveler/safetyrestareas.htm>

At Grade Intersections

Intersections are identified that meet the following criteria:

- On the National Highway System
- Multi lane
- Median separated
- Speeds in excess of 45 mph

These intersections have the potential for serious accidents as the volume of mainline and crossroad traffic increases. WSDOT intends to eliminate these intersections and construct grade-separated roadways to prevent accidents. These projects will also enhance the environment by treating stormwater drainage, and typically improve highway capacity by improving vehicle throughput.

WSDOT prioritizes these projects based on the anticipated number and severity of accidents eliminated as a result of the improvements compared to the cost of the proposed project.

Intersection Improvements

Intersections are identified where traffic volumes are growing and/or minor accidents are beginning to occur. These projects improve safety by adding channelization to eliminate rear-end collisions with left or right turning vehicles, constructing roundabouts, and by adding signals or roundabouts as traffic volumes grow.

These locations are prioritized based on traffic volumes, accidents and the cost of the proposed project.

Pedestrian and Bicycle Risk

Walking and bicycling are integral parts of a balanced transportation system. People in Washington walk and bike to work, school, for pleasure, shopping, and to connect with transit, ferries or other transportation services. Most of us are pedestrians at some point of every day and all modes of transportation include a pedestrian component. In some areas of the state, walking and bicycling play a significant role in reducing traffic congestion.

Walking and biking also have an economic impact. Bicycle touring is big business in Washington generating over \$4 million in revenue primarily for smaller coastal communities along Washington's State route 101. Communities with pedestrian-friendly downtowns may enhance economic vitality by encouraging visitors to stop and shop at businesses. Individuals who walk or ride a bike may see a reduction of expenses related to owning and operating a car.

Locations are identified where pedestrians are at higher risk such as around schools, senior centers, and transit facilities. These locations are identified by WSDOT in coordination with local pedestrian groups.

These projects reduce pedestrian risk by installing or modifying features such as:

- sidewalks to reduce crossing distances at intersections
- better lighting,
- advance warning signs,
- refuge islands in the center of the roadway,
- in-pavement warning systems.

Projects are prioritized by the potential use and cost of the proposed project.

Investment chart (addressing spot with accident history, corridors, preventing crossover on multilane divided and undivided highways, etc...)

Prioritization Process for Selecting Projects

One of the primary goals of priority programming is to maximize return on investment dollars. To ensure to the greatest extent possible that transportation dollars are being spent in those areas with the highest benefit & lowest cost, where possible.

The approach for this HSP update will be a combination of Special Safety Initiatives. These initiatives are prioritized by highest benefit & lowest cost, as well as minimum, moderate, and maximum fixes. These are prioritized based on available funding, and warrant as in some cases a first step towards a more permanent fix as additional funding becomes available.

Performance Measures

Performance Measures are the indicators used to determine if a project, or type of projects are worth the expenditure of public funds required to build them in the first place. Safety Program performance measures include reduction in the number of:

- Crossover head on accidents
- Run off the road accidents
- Enter at angle accidents
- Same direction/Rear end accidents
- Pedestrian Vehicle accidents
- Fixed object Accidents
- Driver fatigue accidents

Currently, bicycling and walking account for approximately 5% of all trips, and over 6% of working trips in urban areas. An average of 88 pedestrians and bicyclists are killed in traffic crashes across the state each year. Over 60% of the bicycle and pedestrian crashes that most often result in serious injuries and death involve young children or the aging. (Source: US Census and the federal Fatality and Accident Reporting System). WSDOT will monitor and report on these and other benchmarks regularly.

