# US 195
# CORRIDOR CRASH ANALYSIS

## EASTERN REGION PLANNING - 2016

Washington State Department of Transportation





Target ZERO

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# Washington State Department of Transportation
**Eastern Region Planning Office**

# US 195 Corridor Crash Analysis
**Study Limits - Stateline Idaho (MP 0.00) to Vicinity of Spangle (MP 80.10)**

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# Disclaimer

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Federal law 23 USC 409 governs the use of these data. Under this law, data maintained for purposes of evaluating potential highway safety enhancements:

*".....shall not be subject to discovery or admitted into evidence in a federal or state court proceeding or considered for other purposes in any action for damages arising from any occurrence at a location mentioned or addressed in such reports, surveys, schedules, lists, or data." [Emphasis added.]*

# Foreword

Washington State Department of Transportation

Over the past decade, the Washington State Department of Transportation (WSDOT) and its partners and stakeholders – including Washington Traffic Safety Commission, local governments, Tribes, state and federal agencies, the private sector, the public and nonprofit and community organizations, have worked together to improve traffic safety.

Washington State's Strategic Highway Safety Plan: Target Zero has the goal of reducing traffic fatalities and serious injuries to zero by the year 2030. The partners that developed Target Zero intend for it to improve the effectiveness of current traffic safety efforts by coordinating safety programs, aligning goals, and leveraging collective resources.

This publication, US 195 Corridor Crash Analysis, identifies and addresses crash trends along the US 195 Corridor from the Idaho/Washington state line to Spangle, Washington. It recommends countermeasures from Target Zero's 4E's; Education, Enforcement, Engineering, and Emergency Medical Services.

The Target Zero process uses route specific data to identify priorities, strategies and potential countermeasures. This analysis followed the Target Zero process, focusing on low-cost, high benefit countermeasures proven to reduce fatal and serious injury crashes.

The Target Zero process includes evaluation of progress towards defined goals, modifying and including new strategies when needed, and then feeding these results back into the planning process framework, so that the WSDOT comprehensive plan can be updated periodically. This new way of thinking for the WSDOT should reduce the potential for crashes and promote more efficient and reliable transportation corridors.

There is limited funding opportunities for the US 195 study section and countermeasures identified in this analysis. This analysis serves to bring awareness to the tools and countermeasures that may be appropriate to consider when this study section meets criteria that prioritizes it for funding.

# Executive Summary

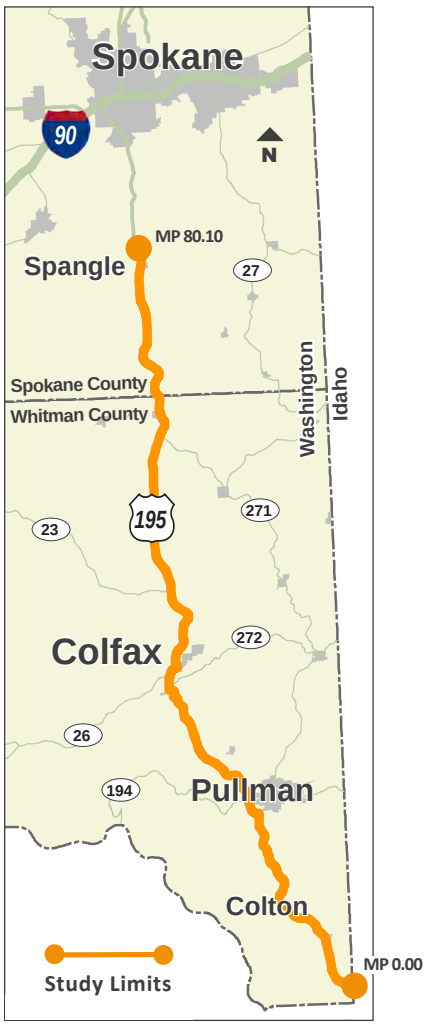
## What is the purpose of the US 195 Corridor Crash Analysis?

**PURPOSE**

The purpose of the US 195 Corridor Crash Analysis, a traffic safety study, is to:

- Identify the most common circumstances or trends that contribute to serious and fatal injury crashes along the corridor
- Identify low-cost solutions or countermeasures that have the greatest potential to reduce serious and fatal injury crashes along the corridor

### US 195 VICINITY MAP




## Where is US 195 located?

**STUDY LOCATION**

US 195 is located in southeastern Washington State. The 80 mile study section starts where the route originates at state line Idaho, about 8 miles north of the Lewiston/Clarkston area, and ends near Spangle, Washington about 13 miles south of Interstate 90 and the city of Spokane. Milepost limits 0.00 to 80.10.

## Who is served by this corridor?

US 195 is a major regional north-south freight corridor. It connects a significant agricultural area known as the Palouse with I-90.

It is a primary route for travelers seeking access to medical services, commercial/retail business centers, the Spokane International Airport, Washington State University (Pullman and Spokane), University of Idaho, and various Spokane and Whitman County communities.

# Executive Summary

## PARTNERS

### Who was involved in the US 195 corridor study?

The Washington State Department of Transportation Eastern Region Planning office conducted the study in collaboration with the following partners:

- City of Colfax Fire Department
- City of Pullman Engineering
- City of Pullman Planning
- City of Pullman Fire Department
- City of Rosalia Fire Department
- Coast Transportation
- Lewis-Clark Valley MPO
- Northwestern Trailways
- Palouse RTPO Pullman Airport
- Pullman Transit
- Spokane County Fire Department
- Spokane County Traffic Engineer
- Spokane County Target Zero Task Force
- University of Idaho Transportation Services
- Washington State Patrol Colfax and Spokane detachments
- Washington State University Police and Public Safety
- Washington State University Transportation Services
- Wheatland Express
- Whitman County Engineering
- Whitman County Planning
- Whitman County District Court
- Whitman County Fire Department
- Whitman County Sheriff
- WSDOT Colfax Maintenance
- WSDOT Public Transportation

## DATA

### What data was used in the corridor study analysis?

The study analysis incorporated the following data:

**Crash data** - Five years of US 195 crash data from the years 2005 through 2009. This data provides crash location; injury severity; crash type; roadway conditions; weather and light conditions; driver contributing circumstances; sobriety; occupant restraint usage; vehicle information; and pedestrian or bicyclist information.

**Enforcement data** - Five years (2005 - 2009) of US 195 enforcement data provided by the Washington State Patrol was evaluated. The data includes information regarding location; infraction type; driver age and gender.

# Executive Summary

**Community engagement** - To gain insight into the needs of the communities that rely on US 195 two tools were used, listening posts and a survey. The listening posts were held at local gathering places and the survey was distributed online and via paper copies.

We asked the public about what concerns they have when travelling the study section; how they perceive other driver's behavior; what behavior they engage in while driving; how they rank crash reduction strategies by importance; their awareness of existing highway safety programs; and anything else they thought was important for us to know.

## What did we learn from our community engagement?

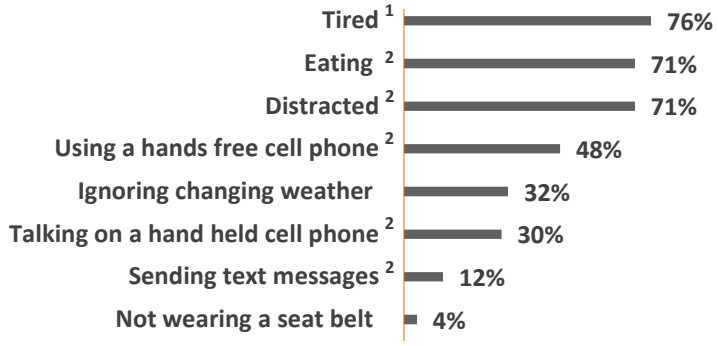
COMMUNITY ENGAGEMENT

Feedback from a public survey, listening posts, and study partners provided the following:

**Opposite direction crashes** are a primary public concern. This was followed by winter weather road conditions, distracted drivers, impaired drivers, speeding drivers, slow moving vehicles, and run-off-the-road crashes.

**Frequent passing by others** ranked first in the survey as a public concern regarding the other driver's behavior. Frequent passing was followed by concerns regarding distracted, aggressive, and/or speeding drivers.

**Survey respondents** self-reported they sometimes drive while:




**Drowsy [1] and distracted [2] driving are both under-reported as a factor that contributes to crashes**

# Executive Summary

## Community Engagement continued

**The public's ranking of strategies** by importance:

1. Engineering — 30%
2. Emergency medical services — 25%
3. Judicial action — 19%
4. Enforcement — 16%
5. Education — 9%

**Road safety programs** such as Target Zero were recognized as familiar by 1 out of 5 survey respondents, while 58% said they had been exposed to a safe driving public service announcement at least once in the prior 30 days.

**Strategies the public recommended** for reducing crashes included roadway design, maintenance, operations, and enforcement. The two most frequently mentioned strategies were:

- Build a four lane highway facility
- Add or revise passing lanes

See Section 2: *Community Engagement* for further discussion

## Enforcement Data

### What did we learn from the enforcement data?

Improper passing, following to close, and improper lane use (e.g. straddling centerline or shoulder) were frequently recorded as violations in the five years of enforcement data.

While the enforcement data included 667 unrestrained vehicle occupant violations, there were only 4 crashes involving an unrestrained occupant during the same period.

See Section 4: *Crash Analysis* for further discussion

## Fatal & Serious Injury Crashes

### What are the trends that are leading to fatal and serious injury crashes?

During the five year study period there were 16 fatal and 23 serious injury crashes recorded that overall resulted in 17 fatalities and 40 serious injuries within the 80 mile study section. The data shows that:

- **Opposite direction crashes** accounted for 11 of the 16 fatal injury crashes

# Executive Summary

- **Run-off-the-Road** crashes accounted for the other 5 fatal crashes
- **Driver behavior** such as speeding, driving under the influence, aggressive, distracted, and drowsy driving was recorded as a contributing factor in 31 out of the 39 fatal and serious injury crashes. Seven of the 8 remaining crashes involved a vehicle crossing the centerline resulting in an opposite direction crash but no driver behavior was recorded as a contributing factor
- **Multiple vehicle** crashes accounted for 27 of the total 39 recorded fatal and serious crashes
- **Heavy Truck** drivers had no recorded contributing circumstances for any of the 6 fatal injury crashes involving a heavy truck
- **Males** comprised 68% of all involved drivers
- **Young drivers** age 16 to 25 comprised 28% of all involved drivers
- **Roadway Conditions** for the majority of these crashes were on a dry roadway surface, during daylight hours, on a straight roadway section

**FATAL & SERIOUS INJURY CRASHES**
**continued**

See Section 4: *Crash Analysis* for further discussion

## What are the challenges?

**CHALLENGES**

No one entity alone will be able to meet the challenge of reducing the crash frequency or injury severity along the US 195 corridor.

Reducing crash potential along the corridor will require effort by drivers along with the partnership of various organizations. As indicated in the study findings, crashes along the corridor are typically the result of driver, roadway, vehicle and/or other factors that are beyond control of any one agency.

Limited funding is a major challenge that many agencies share. For WSDOT the US 195 study section currently has limited funding opportunities. State law requires WSDOT to prioritize safety projects based on statewide needs where the greatest benefit can be realized for the dollars spent.

*The US 195 study segment does not prioritize in regards to deficiencies and needs when compared to other state roads and is unlikely to readily prioritize for engineering safety funding in the near future. As engineering countermeasures are implemented on higher priority routes, this segment may move up on the priority list.*

This analysis shows that the study segment already incorporates many of the identified countermeasures and the operation and safety performance is consistent with the modeled expectation.

# Executive Summary

## Recommendations

Findings indicated crashes along the corridor were attributed more to driver behavior than roadway design. However, to find solutions that worked for both behavior and design, the four E's (enforcement, engineering, emergency medical services, and education) of the Washington State Strategic Highway Safety Plan - Target Zero became part of the evaluation process.

### Enforcement

- Opportunities to increase enforcement and media campaigns that focus on drivers that are impaired, distracted, drowsy, aggressive, and/or exceed reasonable speed should be explored
- Implement an on-going corridor safety evaluation process to identify priorities, strategies, countermeasures, establish reduction goals and periodically reevaluate the same

### Engineering

- Explore opportunities to improve roadway delineation by widening the standard four-inch lane edge striping to six to eight inch widths at select locations
- Install shoulder rumble strips where justified
- Plan and incrementally develop an intelligent transportation corridor and system operations strategies that communicates real-time conditions and driver behavior
- Use mobile speed trailers and static radar feedback signs to alert drivers of their actual speed and the posted speed limit

### Emergency Medical Services

- Increase the number of volunteers along the corridor that are certified as an emergency medical technician (EMT) intermediate level, particularly in areas with increased emergency medical service (EMS) demands
- Explore opportunities to assist with continuing education, certification, and/or recertification

# Executive Summary

## Education

RECOMMENDATIONS
continued

- Create a community based task force, building on the study partner group established for this study. Their role would be to create a vision, build coalitions, establish a local plan, implement the plan, measure results, and continue to revise the plan
- Establish an annual "US 195 Safe Driving Week" to provide local communities the opportunity to emphasize the challenges associated with this rural highway
- Look for opportunities to increase parental involvement in young driver education
- Promote "Pledge Not to Text & Drive" programs
- Encourage public education and outreach programs; addressing what to do if you are involved in a traffic crash, or are passing through a crash scene

The countermeasure section of this study can be used by future planners and designers as a resource for selection and further analysis of crash reduction countermeasures.

## What have we seen since the study was completed?

SINCE THE STUDY

Since the completion of this study we have seen a decline in crashes on US 195, including fatal and serious injury crashes. This matches the downward trend seen statewide and nationally.

| US 195 Crash Data | Study Period | Since Study |
|---|---|---|
| | 2005 - 2009 | 2010 - 2014 |
| **Total Number of Crashes** | 768 | 661 |
| **Fatal Injury Crashes** | 16 | 7 |
| **Serious Injury Crashes** | 23 | 19 |

5 year data periods, January 01 thru December 31

## Why have we seen a downward trend in crashes and injury severity?

Identifying why we see this downward trend is complicated because a range of factors can contribute to a decrease in crashes and injury severity.

These factors include countermeasures from engineering, education,

# Executive Summary

enforcement, emergency medical services, and safety improvements to vehicles.

Policy makers and advocates have used education and enforcement to change driver behavior. WSDOT has used engineering countermeasures to improve users safety. And emergency medical service providers have used effective trauma care to prevent injuries from becoming fatalities.

## What engineering countermeasures have been implemented or Planned?

**Implemented -** Center line rumble strips on the entire 80 mile study section. This effort was started in 2009 and completed in 2010, shoulder rumble strips have been installed at several locations, and guardrail have been replaced and upgraded as necessary.

**Planned -** Passing lanes, as part of a mobility improvement project, are funded and scheduled for construction in 2017. The passing lanes will be located between Colfax and Spangle.

## The Goal - Zero deaths and serious injuries by 2030

Bringing about change that will help us reach this goal requires an on-going effort that will include the four "E's". "**Education**: Give drivers the information to make the best choices. **Enforcement:** Use driver behavior data to help law-enforcement officers pinpoint locations with a high number of serious crashes. **Engineering:** Use best practices to prevent or reduce the severity of crashes. **Emergency Medical Services:** Provide high-quality and rapid emergency and medical response to injury crashes. **Leadership/Policy**: Not an "E", these are strategies that involve laws, agency rules or policy changes." *Target Zero - Washington State Strategic Highway Safety Plan* Retrieved from http://www.targetzero.com/

# Introduction

## Why are planning studies conducted?

Planning studies are typically conducted on state highway facilities to identify needs and opportunities to address performance limitations and propose potential strategies. This is done in collaboration with the public and other stakeholders in a manner that is comprehensive. The studies are part of the Washington State Department of Transportation's (WSDOT) long range planning program and are intended to support local jurisdictions in implementation of the Growth Management Act (GMA) Revised Codes of Washington (RCW) 36.70A.

## What type of study is this?

The US 195 Corridor Crash Analysis is a traffic safety study that focuses on serious and fatal crashes and low cost countermeasures that have the potential to reduce these type of injury crashes. The study aligns with the Washington state Strategic Highway Safety Plan: Target Zero, that addresses the Governor's initiative to reduce traffic fatalities and serious injuries to zero by the year 2030. This study looked at the corridor traffic safety performance and identified low cost solutions/countermeasures that have the greatest potential to reduce serious and fatal injury crashes.

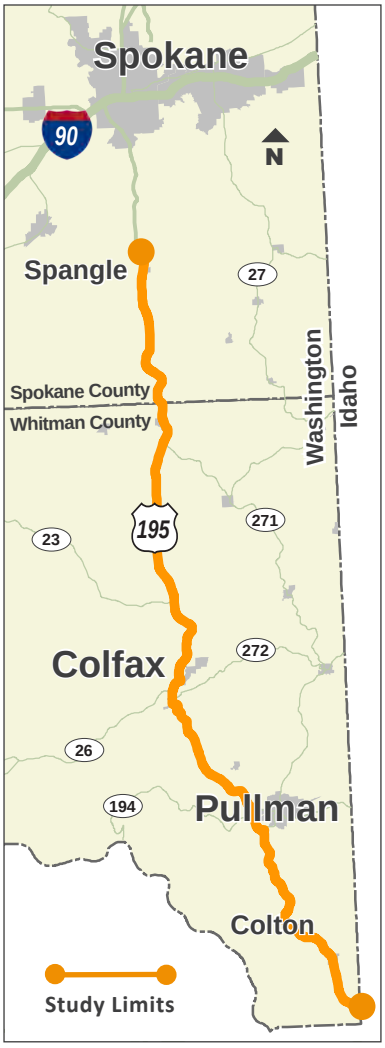
## Where is US 195 located?

US 195 is located in southeastern Washington. The 80 mile study section starts where the route originates at state line Idaho, about 8 miles north of the Lewiston/Clarkston area, and ends near Spangle, Washington about 13 miles south of Interstate 90 and the city of Spokane.

## Who was involved in the US 195 corridor planning study?

The Washington State Department of Transportation (WSDOT) Eastern Region Planning office conducted the study in collaboration with the public, an internal WSDOT steering committee, and a Technical Advisory Committee (TAC). The TAC, a comprehensive stakeholder group, included representatives from the Regional Transportation Planning Organization, various local governments, state, local, and university law enforcement, airports, emergency

US 195 Vicinity Map



medical responders, universities, and transit operators. As many of these professionals are regular users of the corridor, their insight, familiarity with this stretch of highway coupled with their technical experience is key to the development and successful implementation of countermeasures.

## What are the defining characteristics of the study section?

US 195 is a high speed undivided 2-lane rural state route that traverses the rolling farmland of the Palouse.

US 195 is designated as a Highway of Statewide Significance (HSS). HSS routes include interstate highways and other principal arterials that are needed to connect major communities in the state.

It is part of the National Highway System (NHS). NHS routes include interstate highways as well as other roads important to the nation's economy, defense, and mobility.

It is also a US Highway approved by the American Association of State Highway and Transportation Officials (AASHTO). The US numbered highway system is made up of a series of state highways with a uniform US marking that is meant to aid in navigation between states.

US 195 is a major regional freight corridor that connects an important agricultural area known as the Palouse to Interstate 90 and barge ports to the south. It carries between 4 million to 10 million tons of freight per year. It is classified as a T-2 in the Freight and Goods Transportation System.

This section of US 195 does not have any bicycling restrictions. It is used by both recreational bicyclists and organized bike rides like the annual Tour de Lentil near Pullman, WA.

It is a primary route for travelers seeking access to medical services, commercial/retail business centers, the Spokane International Airport, Washington State University, the University of Idaho and most Spokane and Whitman county communities in the vicinity.

The majority of the study section consists of 12-foot lanes and 8-foot shoulders. The Average Daily Traffic in the vicinity of Pullman is 7,300 and 11,000 in the vicinity of Colfax.

## What are the supporting plans and programs?

The supporting plans and programs are: Moving Ahead for Progress in the 21st Century Act (MAP-21), Moving Washington, WSDOT's Sustainable Highway Safety Program, and Washington State's Strategic

# Introduction

## Moving Ahead for Progress in the 21st Century Act

MAP-21 is a streamlined and performance-based program that establishes national performance goals for Federal highway programs. MAP-21 was signed into law in 2012.

One of the core programs of MAP-21 is the Highway Safety Improvement Program. This programs goal is to achieve a significant reduction in traffic fatalities and serious injuries on all public roads.

## Moving Washington

Moving Washington is WSDOT's proven approach which provides the principles for making responsible and sustainable decisions.

## Sustainable Highway Safety Program

WSDOT's Sustainable Highway Safety Program directs WSDOT resources toward the most effective and efficient use of resources to achieve the goals of the Washington State Strategic Highway Safety Plan: Target Zero.

## Washington State's Strategic Highway Safety Plan: Target Zero

Target Zero is the statewide strategic highway safety plan endorsed and used by all key traffic safety agencies. Target Zero sets statewide priorities and is a resource for potential strategies to address each of the priority areas.

Target Zero's stated goal is to reduce traffic fatalities and serious injuries to zero by the year 2030.

This plan promotes four strategies, referred to as the 4 E's, from where solutions/countermeasures are derived and put into practice: Education, Enforcement, Engineering, and Emergency Medical Services.

Target Zero emphasizes data driven evaluation, analysis and diagnosis of safety performance. This emphasis is known as the 5th E of safety.


Washington's economic vitality and renowned livability depend on reliable, responsible and sustainable transportation.

**Moving Washington** is our proven approach for creating an integrated, 21st century transportation system. The objectives are clear and measurable and rely on partnerships that invest for the long term.

**Moving Washington** is our framework for making transparent, cost-effective decisions that keep people and goods moving and support a healthy economy, environment and communities.

**Moving Washington** reflects the state's transportation goals and objectives for planning, operating and investing. State law directs public investments in transportation to support economic vitality, preservation, safety, mobility, the environment and system stewardship.

**For more "Moving Washington" information, please visit the following website: http://www.wsdot.wa.gov/movingwashington/**

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# Community Engagement

## Why did we survey users of US 195?

Community Engagement can provide insight into the needs of a community that study team members may not be aware of. Also, public input is one element that helps with evaluating, comparing, and ranking potential countermeasures.

As one element of the decision making process, Community Engagement is critical for the success of planning studies. **WSDOT Planning Studies Guidelines and Criteria 2007**

## How was the engagement effort conducted?

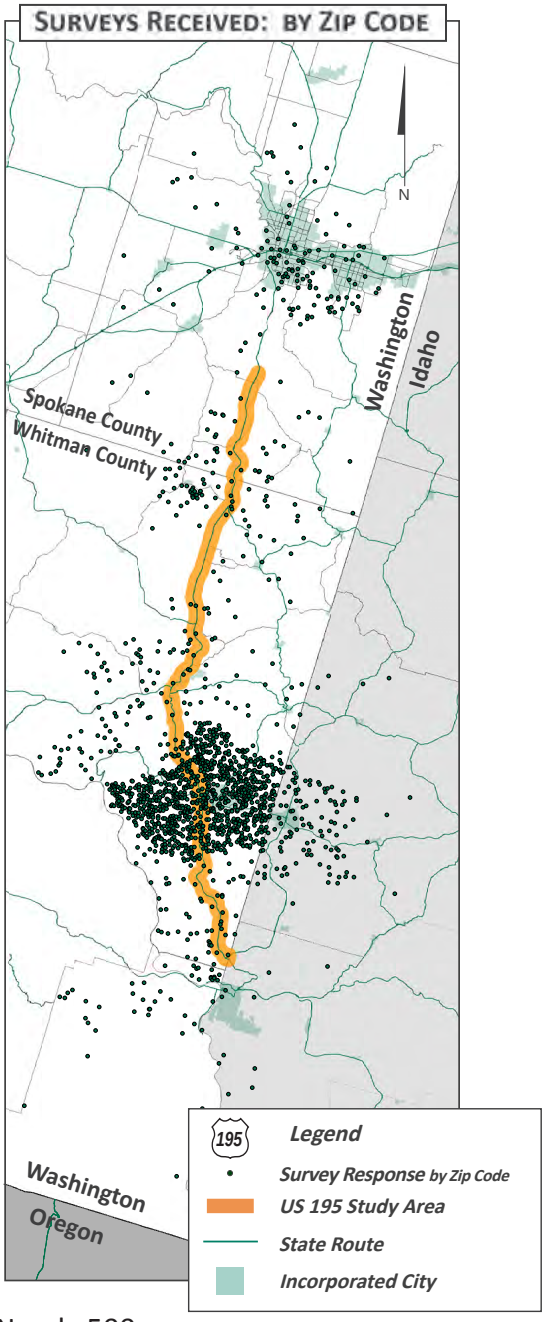
WSDOT's community engagement effort included an online survey questionnaire and on-site Listening Posts at local community gathering places in Rosalia, Colfax, Pullman, and the Washington State University campus. Gathering places included a coffee shop, grocery stores, and student union building.

Listening Post and online survey questionnaire participation was promoted in the media through announcements in the following newspapers:

- Pullman-Moscow Daily
- Colfax Daily Bulletin
- Whitman County Gazette
- Spokesman Review
- WSU Student Newspaper
- Pullman Chamber of Commerce eNews

Additional outreach effort included posters, post cards, and survey questionnaire distribution along the corridor at these locations:

- University of Idaho
- Whitman County Assessor
- Washington State University
- St. Johns Post Office
- Uniontown Post Office
- St. Johns City Hall
- Colton City Hall and Library
- Whitman Grain Growers
- Steptoe Mini Mart
- Oaksdale City Hall
- Rosalia Post Office
- Garfield City Hall
- Albion Post Office
- Oaksdale Post Office
- Colfax City Hall
- Colfax School District
- Palouse City Library
- Colfax Maintenance Office
- Steptoe Post Office




The survey was conducted in 2011 from February thru June. Nearly 500 individuals participated in the online survey. The adjacent map shows the completed surveys received by zip code location.

# Community Engagement

## What is purpose of the survey questions?

**First** - We wanted to better understand how this section of US 195 is being used, how often and the purpose of the trips.

**Second** - We wanted to gauge how the public perceives their own and other driver's behavior while using this section of highway. The purpose was to compare crash history contributing factors on US 195 to high risk behaviors identified by Target Zero and by the National Highway Traffic Safety Administration.


**Third** - Two-open ended questions were designed for the public to tell us what concerns they have, changes they would like to have considered for this route, and anything else they thought was important for us to know.

**Fourth** - We asked about people's awareness of existing safe driving programs and how often they are exposed to safe driving public service announcements, with the purpose of identifying driver educational opportunities.

**Fifth** - We asked the public how they would rank the following by importance to assist with the discussion about the purpose and potential of each of the following strategies: Engineering, emergency medical services, judiciary, enforcement, and driver education.

**Sixth** - As the primary commute corridor between the Palouse area and metropolitan Spokane we sought feedback for measuring current transit use and interest in future expansion of services.

**Finally** - We collected demographic information of those participating in the survey for analysis of sub-groups like age and gender.

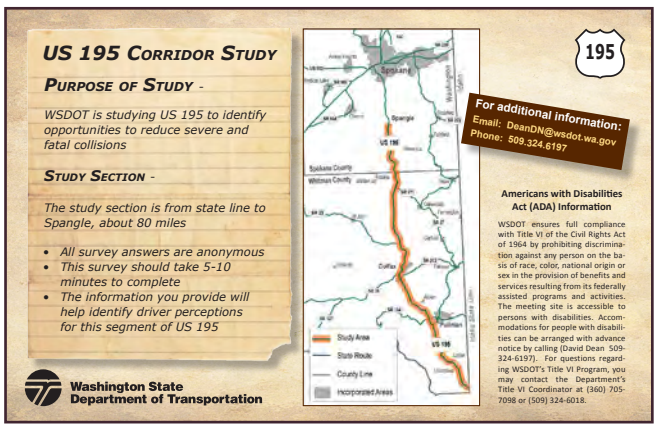

CITY OF ROSALIA

# Community Engagement


WASHINGTON STATE UNIVERSITY

CITY OF ROSALIA

CITY OF COLFAX



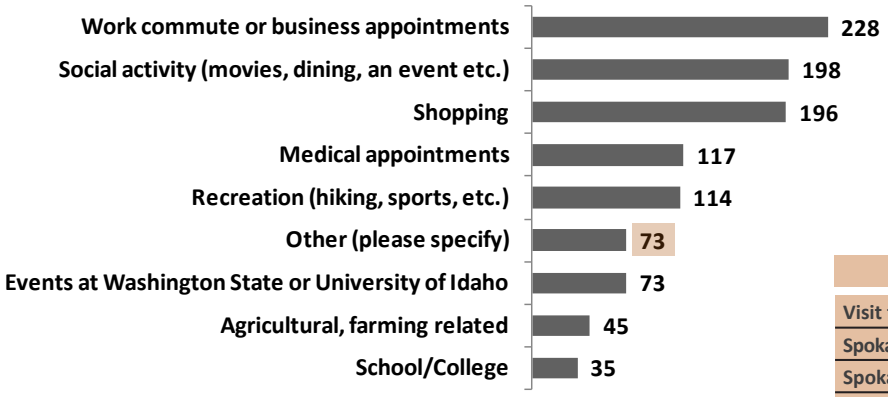

CITY OF PULLMAN

# Community Engagement

## How does the public use the US 195 of study section?

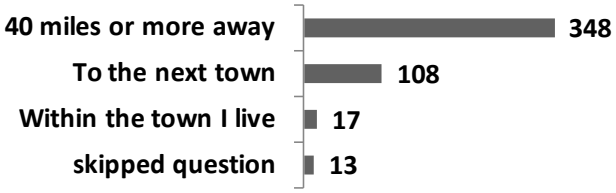
### QESTIONNAIRE RESULTS - QUESTIONS 1 THROUGH 22

### 1 MY MAIN PURPOSE FOR DRIVING US 195 IS TO TRAVEL TO/FROM ...

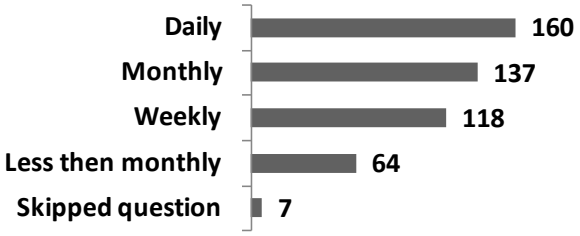



| Other | |
|---|---|
| Visit family/friends | 19 |
| Spokane International Airport - Trip to/from | 16 |
| Spokane - visit, shop, events | 9 |
| General use comment | 8 |
| Work related - School Bus, ambulance driver | 6 |
| Work related - Commute to/from | 4 |
| Work related - Business trip | 4 |
| Church related events | 3 |
| Work related - Freight delivery truck | 2 |
| Pullman events | 2 |

### 2 THE TRIPS I TAKE ON US 195 ARE MOST OFTEN ...




### 3 NORMALLY I DRIVE ON THIS SEGMENT OF US 195 ...



## Driver behavior

| | 4 & 5 WHILE DRIVING ON THIS SEGMENT OF US 195, MY LEVEL OF CONCERN FOR THE FOLLOWING IS ... | Very Concerned | Concerned | Somewhat Concerned | Not Concerned at All | Response Count | Rank Average | I Don't Know |
|---|---|---|---|---|---|---|---|---|
| | Ranked by weighted Scale 100 - 25 | 100 | 75 | 50 | 25 | | | |
| 1 | Opposite direction crashes (Head-ons)[1] | 243 | 120 | 92 | 15 | 470 | 82 | 2 |
| 2 | Snow and ice | 199 | 168 | 86 | 13 | 466 | 80 | 0 |
| 3 | Distracted drivers[1] | 188 | 174 | 92 | 14 | 468 | 79 | 5 |
| 4 | Impaired drivers (Alcohol, drugs)[1] | 167 | 126 | 128 | 41 | 462 | 74 | 6 |
| 5 | Speeding[1,3] | 162 | 127 | 106 | 73 | 468 | 70 | 2 |
| 6 | Slow moving vehicles | 113 | 127 | 142 | 73 | 455 | 67 | 13 |
| 6 | Run-off-the-road crashes[1] | 118 | 146 | 141 | 63 | 468 | 67 | 1 |
| 7 | Young drivers[1] | 100 | 129 | 157 | 70 | 456 | 66 | 13 |
| 8 | Intersections[1] | 79 | 101 | 181 | 93 | 454 | 60 | 6 |
| 9 | Timely road condition information | 67 | 125 | 149 | 115 | 456 | 59 | 6 |
| 10 | Emergency medical services (Training, response time)[2] | 56 | 105 | 132 | 160 | 453 | 54 | 10 |
| 11 | Motorcycles[1] | 32 | 98 | 167 | 157 | 454 | 51 | 7 |
| 12 | Unlicensed drivers[1] | 31 | 56 | 139 | 196 | 422 | 50 | 38 |
| 12 | Unrestrained occupants (Seat belts, child seats)[1] | 33 | 65 | 125 | 205 | 428 | 50 | 35 |
| 13 | Pedestrians[1] | 10 | 41 | 131 | 266 | 448 | 40 | 11 |

TARGET ZERO PRIORITY[1] - WASHINGTON STATE'S STRATEGIC HIGHWAY SAFETY PLAN 2010
TARGET ZERO FOUR E'S FOCUS[2] - EDUCATION, ENFORCEMENT, ENGINEERING, EMERGENCY MEDICAL SERVICES
AGGRESSIVE DRIVING DEFINITION[3] - NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

# Community Engagement

| 6 OTHER DRIVER'S BEHAVIOR: WHILE DRIVING THIS SEGMENT OF US 195 HOW CONCERNED ARE YOU WITH DRIVERS THAT ... | | Very Concerned | Concerned | Somewhat Concerned | Not Concerned at All | Response Count | Rank Average | I Don't Know |
|---|---|---|---|---|---|---|---|---|
| | Ranked by weighted Scale 100 -25 | 100 | 75 | 50 | 25 | | | |
| 1 | Are distracted and not paying attention to their driving[1] | 208 | 146 | 96 | 13 | 463 | 80 | 4 |
| 2 | Frequently pass others[3] | 221 | 115 | 91 | 41 | 468 | 78 | 2 |
| 3 | Follow too close[3] | 203 | 132 | 107 | 25 | 467 | 77 | 1 |
| 4 | Ignore traffic safety rules[3] | 179 | 144 | 104 | 37 | 464 | 75 | 4 |
| 5 | Speed[1,3] | 179 | 126 | 115 | 49 | 469 | 73 | 1 |
| 6 | Pass another driver, then slow down to teach them a lesson[3] | 122 | 125 | 111 | 100 | 458 | 65 | 9 |
| 7 | Brake to get others to back off their bumper[3] | 60 | 94 | 142 | 163 | 459 | 53 | 6 |
| 8 | Speed up to beat traffic lights[3] | 53 | 64 | 104 | 224 | 445 | 47 | 15 |
| 9 | Flash headlights at other drivers[3] | 32 | 71 | 118 | 231 | 452 | 45 | 11 |
| 10 | Are verbally abusive[3] | 30 | 50 | 117 | 236 | 433 | 43 | 26 |
| 11 | Use the horn a lot[3] | 17 | 41 | 91 | 300 | 449 | 37 | 12 |

| 7 WHILE DRIVING THIS SECTION OF US 195 I FIND MYSELF ... | | Very often | Often | Sometimes | Never | Response Count | Rank Average |
|---|---|---|---|---|---|---|---|
| | Ranked by weighted Scale 100 - 25 | 100 | 75 | 50 | 25 | | |
| 1 | Being in a hurry[1] | 47 | 23 | 310 | 89 | 469 | 51 |
| 2 | Driving tired[1] | 21 | 18 | 316 | 115 | 470 | 47 |
| 3 | Eating[1] | 26 | 12 | 297 | 135 | 470 | 46 |
| 4 | Distracted[1] | 11 | 4 | 318 | 136 | 469 | 44 |
| 5 | Using a hands free cell phone[1] | 38 | 27 | 162 | 241 | 468 | 43 |
| 6 | Ignoring changing weather | 15 | 6 | 130 | 318 | 469 | 35 |
| 7 | Talking on a hand held cell phone[1] | 3 | 6 | 130 | 332 | 471 | 33 |
| 8 | Sending text messages[1] | 6 | 6 | 46 | 413 | 471 | 29 |
| 9 | Not using seat belts[1] | 3 | 4 | 12 | 451 | 470 | 27 |

TARGET ZERO PRIORITY[1] - WASHINGTON STATE'S STRATEGIC HIGHWAY SAFETY PLAN 2010

AGGRESSIVE DRIVING DEFINITION[3] - NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

## Open-ended questions 8 & 9

The two open-ended questions included in the survey were:

**8. What changes would you like to see happen on this segment of US 195?**

**9. Is there anything else about this segment of US 195 you would like to share with WSDOT?**

These two questions were intended to gauge concerns that may not have been captured in the multiple choice section of this survey.

Of the nearly 500 survey participants, 388 responded to question 8, and 233 responded to question 9. The level of detail among responses varied. One person may have included a single comment regarding an idea or concern while another person had multiple comments to share.

Comments ranged from concerns about driver behavior, roadway conditions, specific locations on the study section. These two questions combined contained more than 1200 individual concerns and ideas.

Most comments shared common themes and these were grouped based on how the person expressed what needed to be done. For example, people said they were concerned about passing and suggested additional enforcement or adding passing lanes or reviewing passing areas. This passing concern or theme would be grouped under Enforcement, Roadway Design, and Operations respectively.

All groups are as follows:

- **Roadway Design**
- **Driver Behavior**
- **Enforcement**
- **Roadway Maintenance**
- **Roadway Operations**
- **Other Comments**

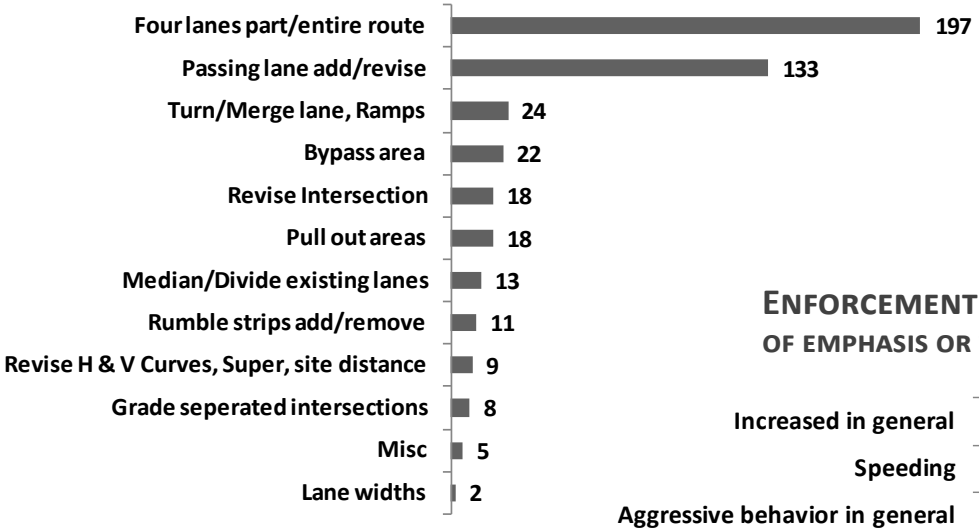
The public's input was compared to the corridor crash history, Washington State's Strategic Target Zero definitions, National Highway Traffic Safety Administration aggressive driving definitions, and proposed countermeasures.

The following charts reflect the open-ended question input.

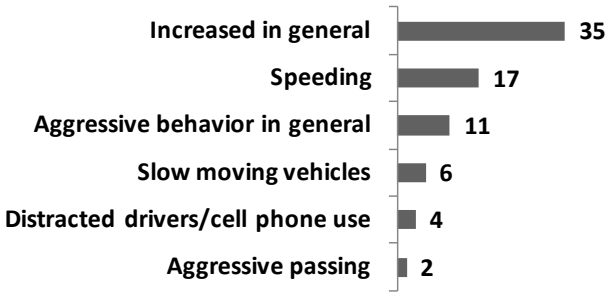
# Community Engagement

## Open-ended questions 8 & 9 con't

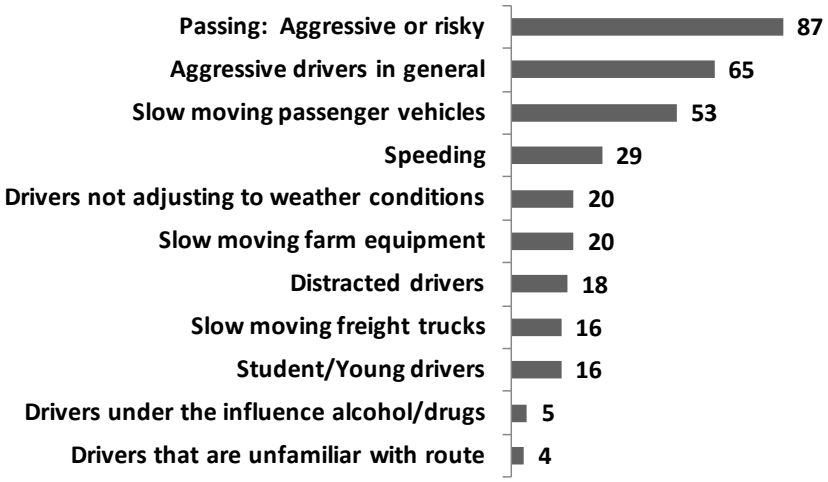
### Roadway Design - In terms of constructing, adding or changing geometry




### Enforcement - In terms of emphasis or targeting

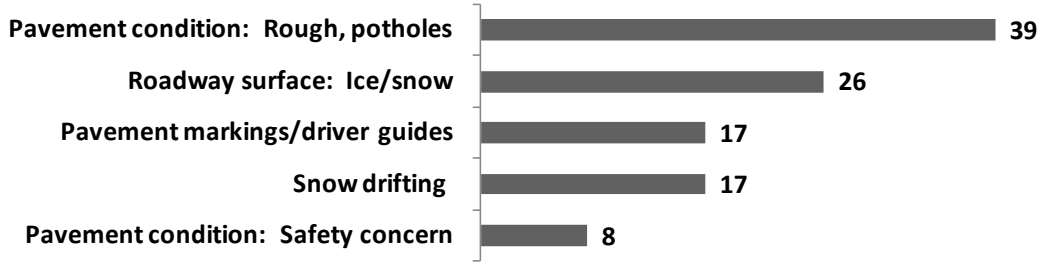



### Driver Behavior - In terms of a stated concern

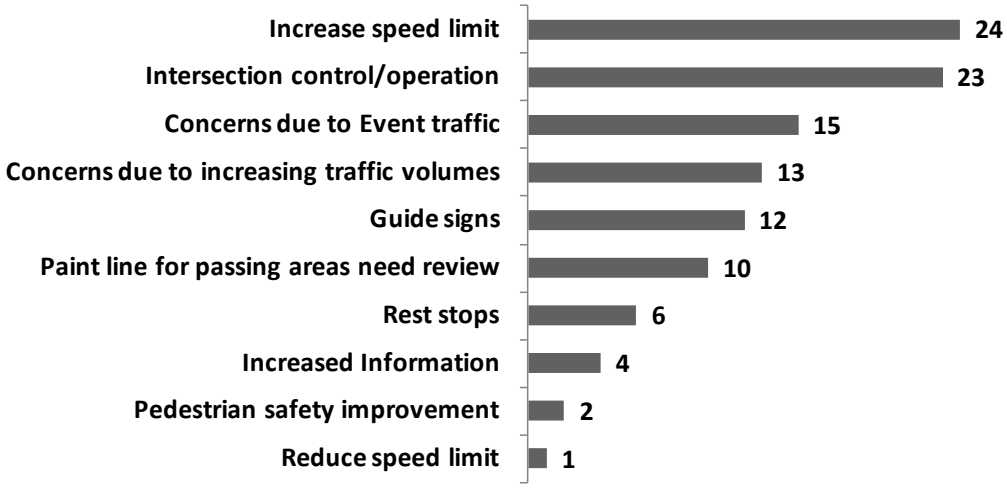


## Open-ended questions 8 & 9 con't

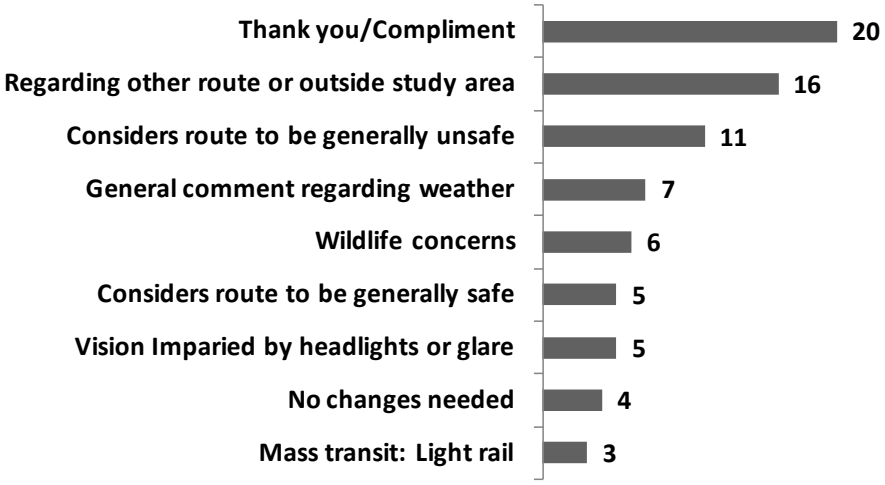
### Roadway Maintenance - In terms of increased attention or repair




### Roadway Operations - In terms of revision, change, or stated concern



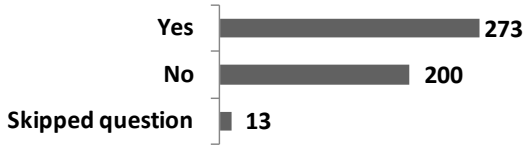

### Other Comments



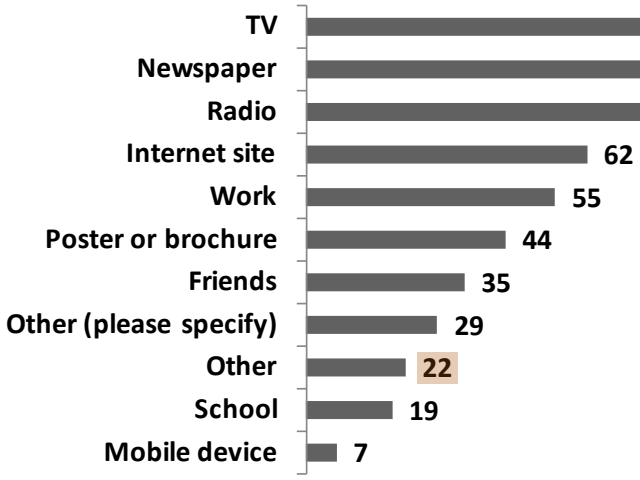
# Community Engagement

## Safe driving programs

**10** HAVE YOU READ, SEEN, OR HEARD ANYTHING ABOUT SAFE DRIVING IN THE PAST 30 DAYS?

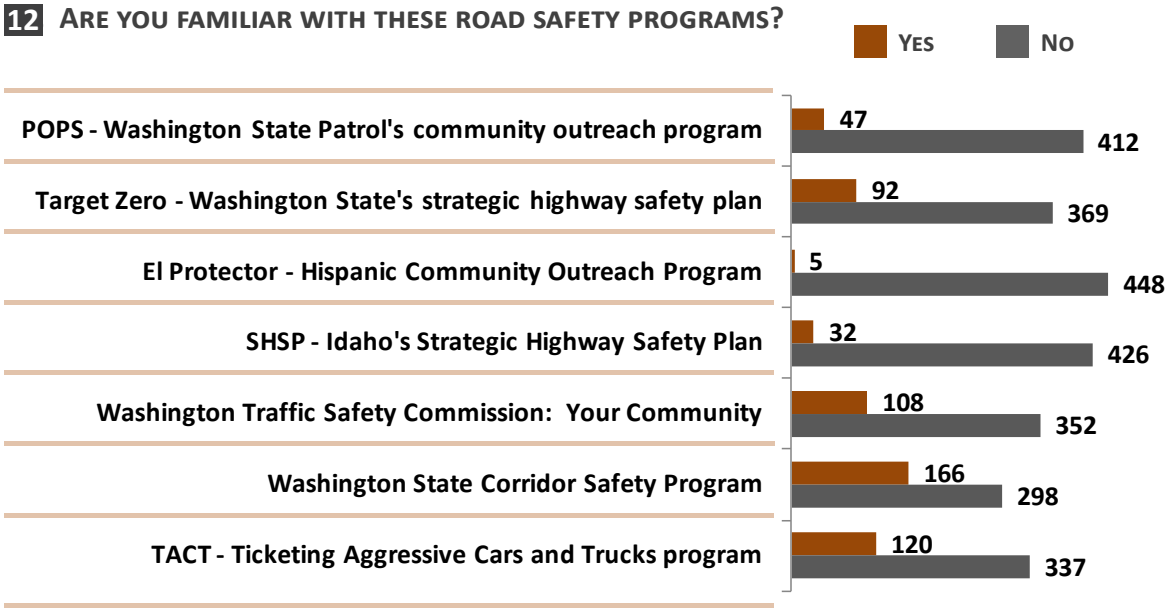



**11** IF YES: WHERE?



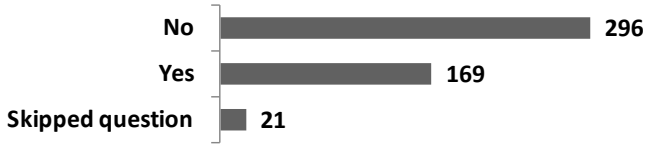

| Other | |
|---|---|
| Roadside Sign | 12 |
| Magazine | 5 |
| Safe Driving Course | 3 |
| Billboard | 2 |
| Truck Driver Training | 2 |
| Fire Station | 1 |
| DMV | 1 |
| Family | 1 |
| Insurance Company | 1 |
| Law Enforcement | 1 |

**12** ARE YOU FAMILIAR WITH THESE ROAD SAFETY PROGRAMS?



## Funding law

**13** DID YOU KNOW THAT WSDOT IS REQUIRED BY LAW TO PRIORITIZE SAFETY PROJECTS BASED ON POTENTIAL TO REDUCE FATAL AND SERIOUS CRASHES ON STATE HIGHWAYS?



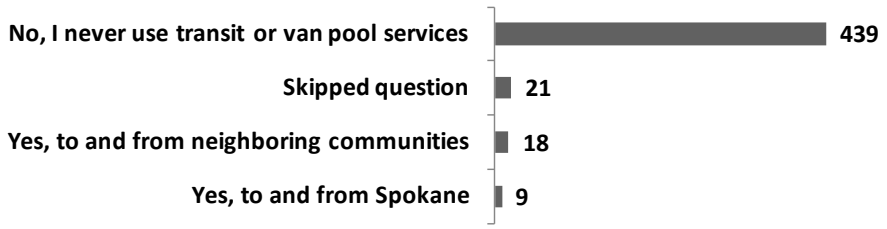

## Strategy ranking

| | **14** HOW WOULD YOU RANK THE FOLLOWING BY IMPORTANCE? | Extremely Important | Very Important | Important | Neither Important nor Unimportant | Not Important | Response Count | Ranking Average |
|---|---|---|---|---|---|---|---|---|
| | Ranked by weighted Scale 100 - 20 | 100 | 80 | 60 | 40 | 20 | | |
| 1 | Engineering[2]: Design roads using best practices | 266 | 127 | 60 | 7 | 5 | 465 | 88 |
| 2 | Emergency Medical Services[2]: Provide high quality and rapid response to injury crashes | 222 | 136 | 94 | 9 | 6 | 467 | 84 |
| 3 | Judicial: Appropriate consequences for risky driver behavior | 162 | 151 | 119 | 25 | 8 | 465 | 79 |
| 4 | Enforcement[2]: Use analysis to help law enforcement officers address problem behavior or locations | 144 | 154 | 135 | 21 | 11 | 465 | 77 |
| 5 | Education[2]: Give drivers the information to make good choices | 79 | 122 | 198 | 49 | 18 | 466 | 68 |

TARGET ZERO FOUR E'S FOCUS[2] - EDUCATION, ENFORCEMENT, ENGINEERING, EMERGENCY MEDICAL SERVICES

## Public transportation

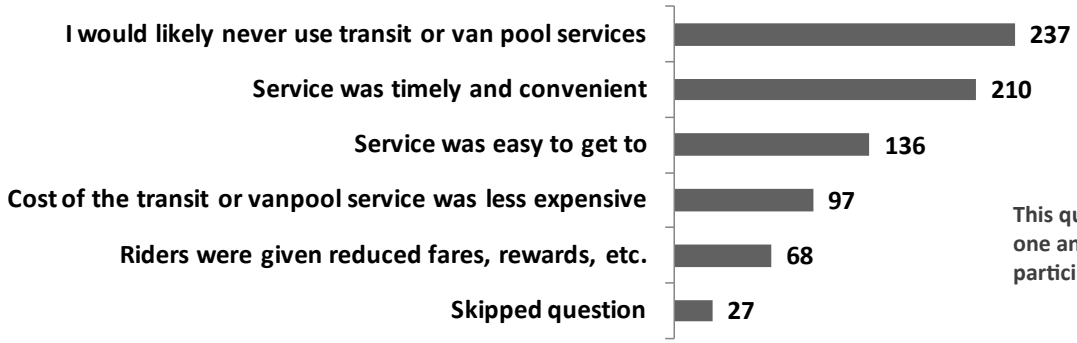
**15** DO YOU CURRENTLY USE A TRANSIT OR VAN POOL SERVICE?



# Community Engagement

## Public transportation

**16** WOULD YOU CONSIDER COMMUTING TO NEIGHBORING COMMUNITIES BY TRANSIT OR VAN POOL IF THE ...

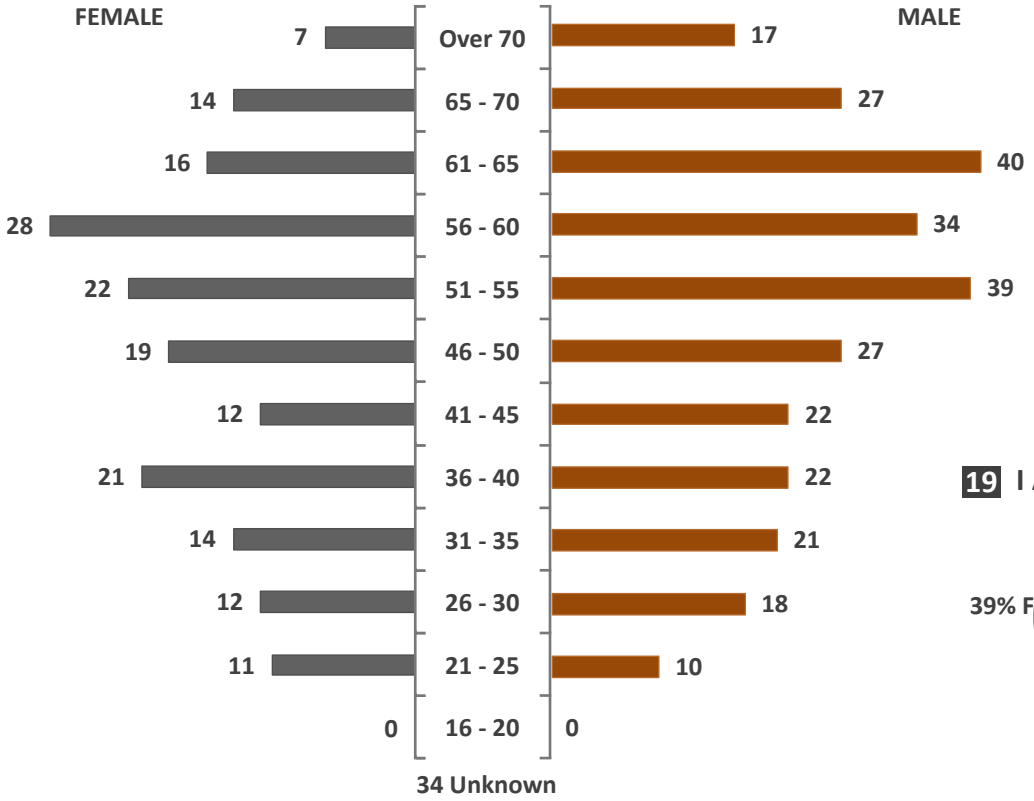



This question allowed more than one answer. About 500 people participated in the survey.

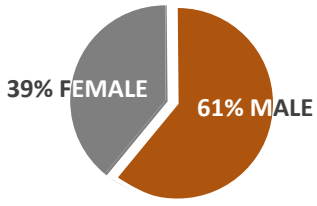
## Demographic

**17** MY ZIP CODE: SEE SCATTER MAP

**18** YEAR OF MY BIRTH: (CATEGORIZED BY AGE GROUP)

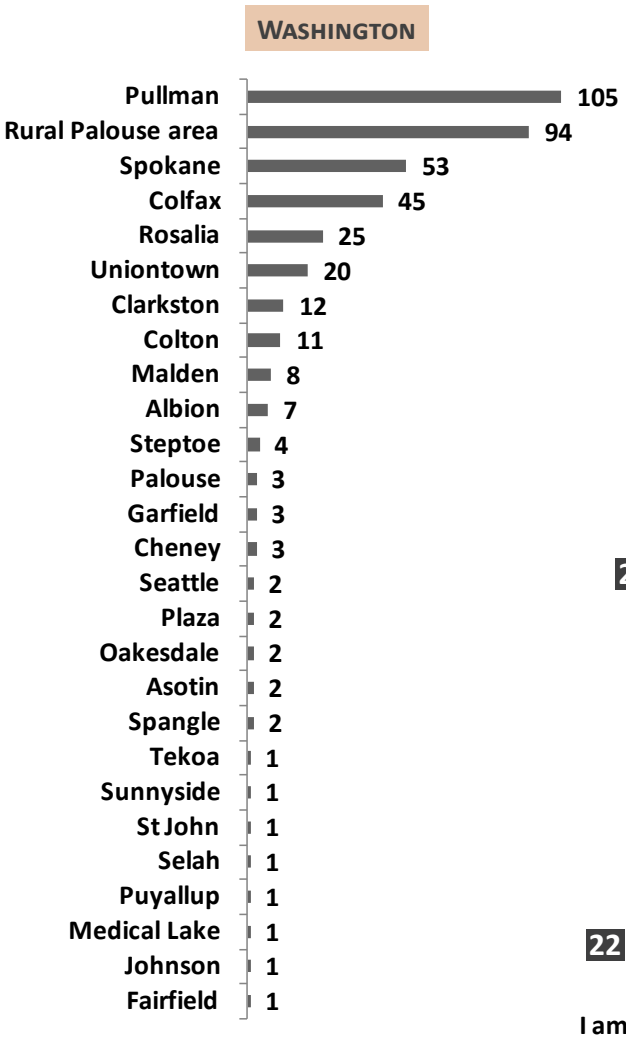


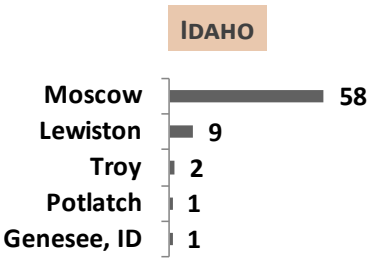

**19** I AM



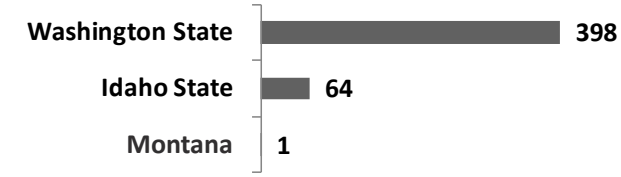
## Demographic

### 20 I CURRENTLY LIVE IN?

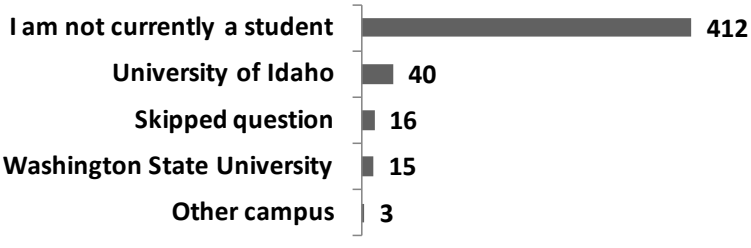



### 21 MY PERMANENT PLACE OF RESIDENCE IS IN ...




### 22 I AM A STUDENT AT



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# Washington State Patrol

## Washington State Patrol and traffic safety

Washington State Patrol (WSP) makes a difference everyday by reducing the potential for crashes for users of state routes. As one trooper stated "The bread and butter of our organization is traffic safety."

WSP accomplishes this with routine traffic and emphasis patrols, Click It or Ticket (CIOT) campaign, Problem Oriented Public Safety (POPS), Ticketing Aggressive Cars and Trucks (TACT), and educational outreach. These are just some of the countermeasures that WSP employs to improve our roadway safety.

## How is WSP involved with Target Zero?

WSP, along with WSDOT, took the lead in developing "Target Zero - Washington State's Strategic Highway 2010 Safety Plan." WSP also serves as a member of the Washington State Traffic Commission's board of Commissioners.

## How has WSP participated in the US 195 study?

Washington State Patrol has participated in a number of ways. First, as members of the US 195 studies Technical Advisory Committee, WSP Troopers along with Whitman County Sheriff deputies served as subject expert resources. As experts their knowledge helped us focus on US 195 specific issues.

Second, WSP shared five years of driver enforcement data. This data records why and where a stop was initiated, driver age, gender, and time of day. This data is derived from The Trooper's Time and Activity Report (TARS).

This data, along with the five years of crash data, was used to further identify risky driver behaviors on US 195 and identify potential countermeasures.

An overview of the enforcement data and its summary, is presented in section 4, Crash Analysis section of this study.

## How does enforcement influence drivers behavior and safety?

Lieutenant Steve Turcott of WSP shared the following:

"The Washington State Patrol is responsible for promoting highway traffic safety. This objective is manifested largely in efforts to reduce crashes and their severity. The agency attempts to influence driver behavior using enforcement and education, in support of the effort to prevent and reduce loss of life, injuries, and property damage in highway traffic crashes. The agency realizes that its enforcement efforts provide the desired crash prevention influence through the combined influence of a number of strategies and practices.

Through traffic enforcement, the State Patrol positively influences driver behavior. Education of drivers is a component of the troopers' enforcement work and is accomplished by issuing verbal and written warnings as well as through issuing infraction notices and criminal citations.

# Washington State Patrol

When able to do so, troopers prioritize their crash prevention efforts at locations and times that are consistent with patterns of crash occurrences.

When troopers' enforcement efforts are in response to identifiable crash patterns, the breadth of the geographic area where troopers work is influenced by the following:

- Narrow vs. broad crash area
- The availability of safe locations to stop traffic violators
- Time available for enforcement vs. response to calls for service which is also a function of staffing.

It is recognized that some motorists' driving practices are influenced by the probability of being stopped by a trooper and the potential of receiving a traffic ticket. Trooper visibility on the highways has a positive impact on driver practices.

- This is enhanced when troopers are seen conducting traffic stops as opposed to being seen merely patrolling or being present.
- It is also enhanced in a given geographic area when trooper presence is common. That is, motorists are more responsive to trooper presence in a particular area if a given motorist sees troopers in that area frequently.

Driver behavior is influenced by trooper presence regardless of the reason for the trooper's presence. A trooper assisting a disabled vehicle along the highway has the same influence on passing motorists as would be the case if the trooper was taking enforcement action with a violator. In other words, speeders slow down even if the reason the traffic stop is another violation (or a disabled vehicle assist).

Frequently recurring trooper presence on a rural highway between two towns has influence on the behavior of drivers who use that highway frequently. This influence on drivers (caused by the troopers' patrolling, conducting traffic stops, and assisting disabled vehicles) is effective throughout the highway segment. It is not limited to only the single mile where a traffic stop is seen.

Patterns of high risk driving that contribute to crashes are influenced by troopers addressing those driving practices, but they are also influenced by troopers making traffic stops for other violations as well. If troopers are addressing a pattern of crashes caused by driving to fast for conditions, they would not normally ignore drivers who are following too closely or aggressive passing or passing where prohibited or insufficient distance exist between vehicles. Generally, any and all dangerous violations would result in traffic stops, including driving behavior not related to the pattern of crashes."

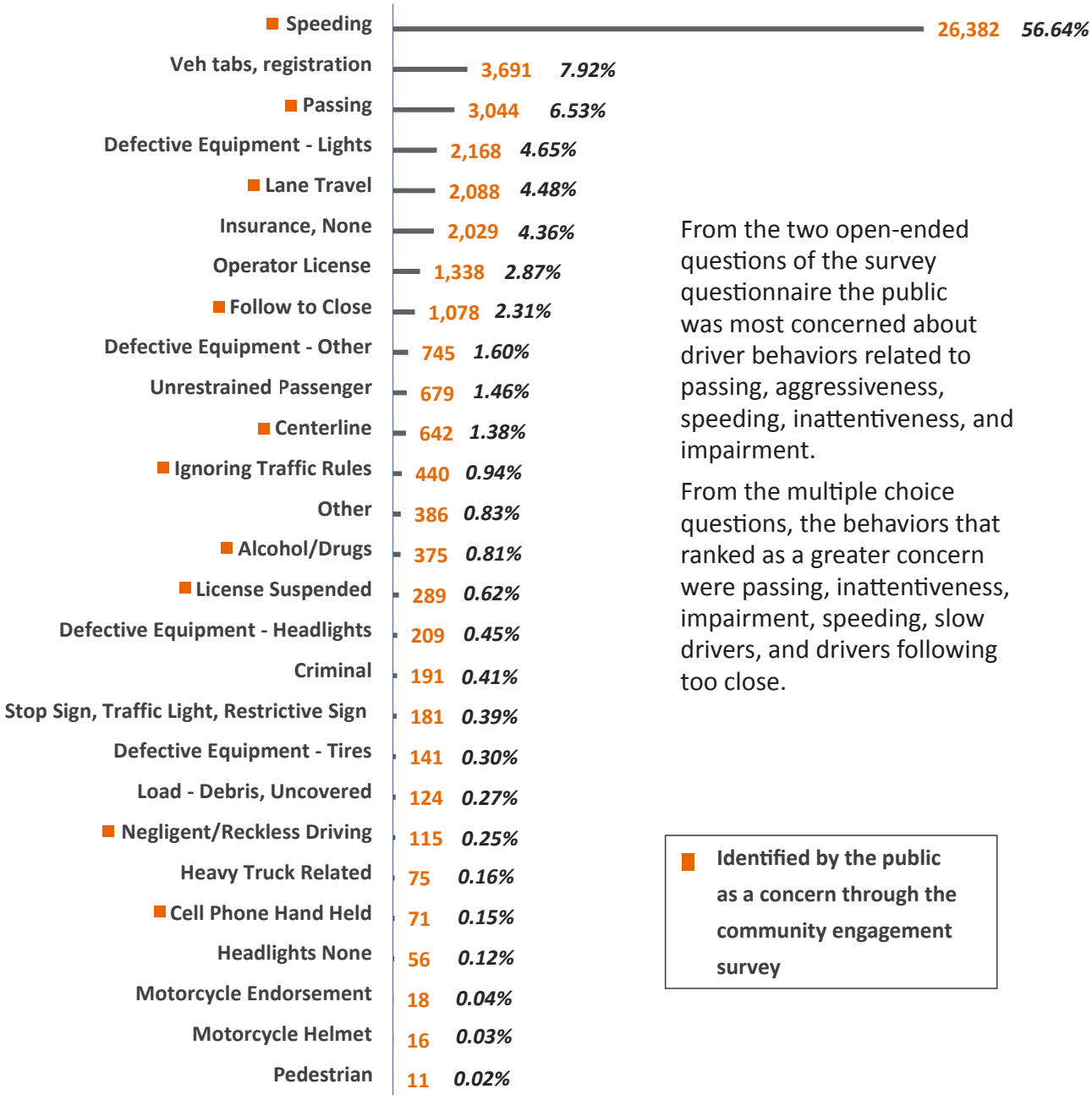
**Lieutenant Steve Turcott**
**Washington State Patrol**
**December 26, 2011**

# Washington State Patrol

## What does the enforcement data show?

The following enforcement data represents verbal warnings, written warnings, and issued citations recorded during the five year study period of 2005 - 2009.

**Enforcement data summary by traffic stop count and percent of total stops**




From the two open-ended questions of the survey questionnaire the public was most concerned about driver behaviors related to passing, aggressiveness, speeding, inattentiveness, and impairment.

From the multiple choice questions, the behaviors that ranked as a greater concern were passing, inattentiveness, impairment, speeding, slow drivers, and drivers following too close.

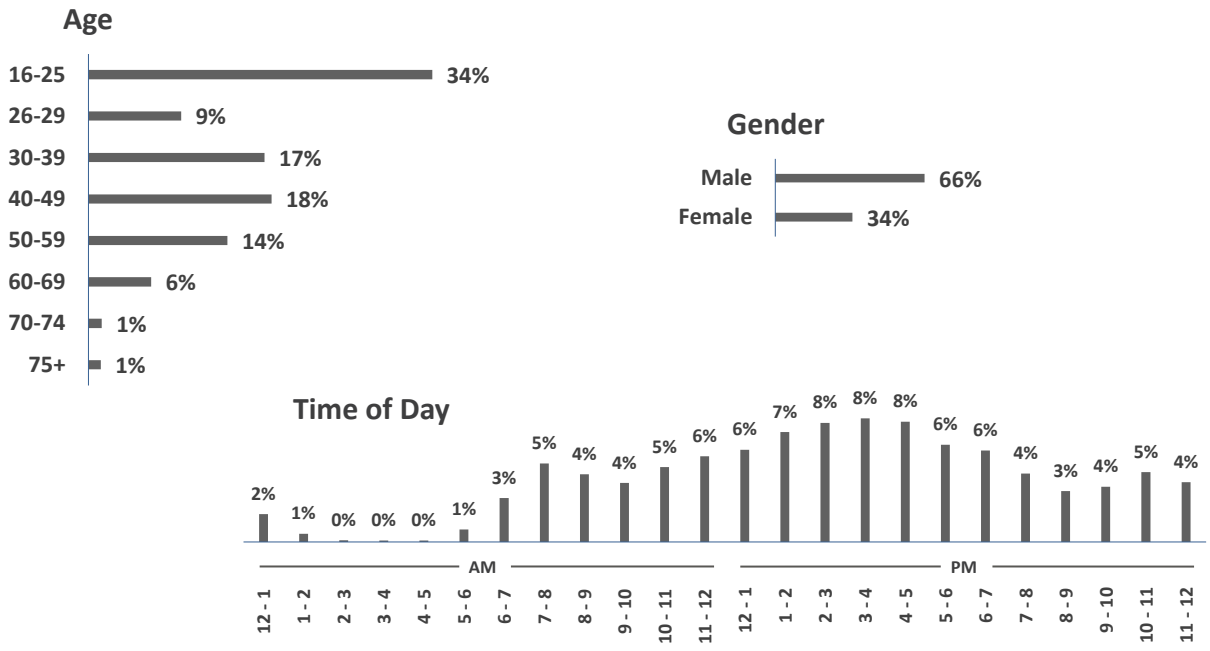
**Identified by the public as a concern through the community engagement survey**

# Washington State Patrol

## What does the enforcement data show? con't.

The following enforcement data represents verbal warnings, written warnings, and issued citations recorded during the five year study period of 2005 - 2009.

**Enforcement data summary by percent of all traffic stops**




## Did the enforcement data show us anything different from the crash data?

The enforcement data does show 289 cases of a person driving with a suspended license. The crash data does not capture license status.

While the rate of unlicensed drivers on US 195 compared to other state highways is not known, what is known is that unlicensed drivers pose a greater risk of being involved in a fatal crash when speeding or driving impaired.

**Target Zero Strategic Highway Safety Plan 2010, Priority Level Three: Unlicensed Drivers page 55**

# Crash Analysis

## Contributing crash factors

Human factors are generally a significant component in all crashes.

"Crash factors may be related to roadway geometrics, condition, etc.; human factors, such as driver/pedestrian/motorcyclist behavior; vehicle factors which contribute to crash avoidance and survivability; and environmental conditions such as snow, ice, rain, and wind. Figure 3.2 illustrates an overall analysis of crash factors. While these percentages may not hold true for any specific situation; they generally show human factors are a significant component in all crashes, but other factors, such as roadway factors, are related as well." **Highway Safety Improvement Program Manual - FHWA**

**Crash Factors**

57% of crashes were due solely to driver factors

27% combined roadway and driver factors

6% combined vehicle and driver factors

3% solely to roadway factors

3% roadway, driver, and vehicle factors

2% solely to vehicle factors

1% combined roadway and vehicle factors

**The Role of Perceptual and Cognitive Filters in Observed Behavior, Human Behavior in Traffic Safety. K. Rumar**

## What will I see in this section?

In this section you will see a summary of US 195 crash data from January 01, 2005 to December 31, 2009.

The data is summarized by "Washington State Strategic Highway Safety Plan - Target Zero" priorities, fatal and serious injury crashes only, and all injury crash types.

Crash factors include crash type, driver behavior, driver age and gender, the number of vehicles involved, and road conditions.

This data is derived from reports completed by enforcement officers responding to crash incidents. WSDOT's Statewide Travel and Crash Data Office is responsible for collecting, processing and disseminating this crash data.

# Crash Analysis

## Fatal & Serious Injury Crashes

**During the 5 year study period**

16 Fatal crashes resulted in:
17 Fatalities & 5 Serious Injuries

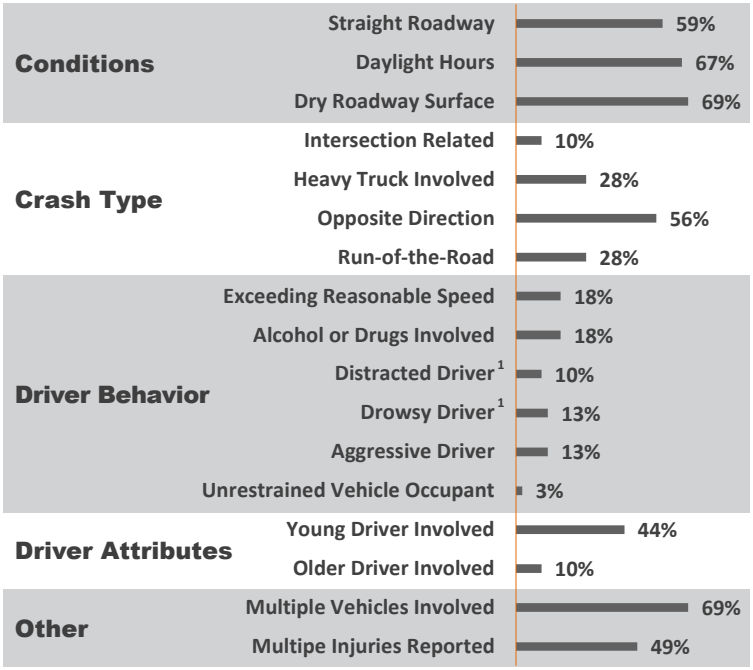
23 Serious Injury crashes resulted in: 35 Serious Injuries

### Fatal and serious Injury crashes, What did we learn?

During the five year study period there were 16 fatal and 23 serious injury crashes that resulted in 17 fatalities and 40 serious injuries.

- Opposite direction crashes accounted for 11 of the 16 fatal injury crashes.

**Factors involved for all 23 serious and 16 fatal crashes**




[1] Distracted and Drowsy Driver - The extent of these two behaviors contributing to crashes is unknown due to under-reporting

- Run-off-the-Road vehicles accounted for the other 5 fatal crashes.
- 79% (31) of serious and fatal injury crashes had a recorded driver behavior that was a contributing factor.
- The other 21% (8) crashes had no recorded driver contributing factor. Seven of these 8 had a vehicle crossing over the centerline. All were during daylight hours, 6 were on a dry road surface.
- A heavy truck was involved in 11 of the 39 serious and fatal crashes. Nine of the 11 truck drivers had no contributing circumstance recorded.
- Snow/slush, ice, or a wet roadway condition was recorded for 12 of the 39 crashes, of these, nine had at least one driver behavior that was a contributing factor. Two of the other 3 crossed over centerline and the third had a contributing circumstance of other.
- A young driver, age 16 to 25, was involved in 17 of the 39 serious and fatal crashes.

## Factors by most Serious Injury Type - All Crashes

**768 total crashes 2005 - 2009**

| | Totals → | 468 | 16 | 23 | 130 | 122 | 9 |
|---|---|---|---|---|---|---|---|
| | Injury Type → / Prominent Factors Involved | No Injury | Fatal | Serious | Evident | Possible | Unknown |
| | **Conditions** | | | | | | |
| | Straight Roadway | 343 | 11 | 12 | 87 | 79 | 8 |
| | Daylight Hours | 229 | 8 | 18 | 68 | 81 | 5 |
| | Dry Roadway Surface | 225 | 14 | 13 | 68 | 73 | 5 |
| | **Crash Type** | | | | | | |
| *Target Zero Priorities* | Intersection Related | 62 | 0 | 4 | 16 | 24 | 2 |
| *Target Zero Priorities* | Heavy Truck Involved | 50 | 6 | 5 | 16 | 5 | 2 |
| *Target Zero Priorities* | Opposite Direction | 31 | 11 | 11 | 14 | 4 | 0 |
| *Target Zero Priorities* | Run-off-the-Road | 237 | 5 | 6 | 81 | 76 | 3 |
| | **Driver Behavior** | | | | | | |
| *Target Zero Priorities* | Exceeding Reasonable Speed [1] | 184 | 4 | 4 | 61 | 42 | 1 |
| *Target Zero Priorities* | Alcohol or Drugs Involved | 13 | 5 | 2 | 9 | 5 | 2 |
| *Target Zero Priorities* | Distracted Driver [2] | 38 | 2 | 2 | 12 | 17 | 2 |
| *Target Zero Priorities* | Drowsy Driver [2] | 30 | 3 | 2 | 16 | 15 | 0 |
| *Target Zero Priorities* | Aggressive Driver [3] | 21 | 2 | 3 | 12 | 9 | 0 |
| *Target Zero Priorities* | Unrestrained Vehicle Occupant | 2 | 1 | 0 | 1 | 0 | 0 |
| | **Driver Attributes** | | | | | | |
| *Target Zero Priorities* | Young Driver Involved | 211 | 6 | 11 | 57 | 53 | 2 |
| *Target Zero Priorities* | Older Driver Involved | 18 | 3 | 1 | 4 | 3 | 0 |
| | Male Driver - Vehicle One | 61% | 56% | 61% | 63% | 51% | 43% |
| | Male Driver - Vehicle Two | 62% | 91% | 75% | 82% | 66% | 50% |
| | **Other** | | | | | | |
| | Multiple Vehicles Involved | 35% | 69% | 70% | 32% | 35% | 44% |
| | Multiple Injuries Reported | NA | 44% | 52% | 35% | 21% | NA |

[1] Exceeding Reasonable Speed - Only 10 of the 296 were exceeding the posted speed limit, all others were exceeding reasonable speed for conditions.

[2] Distracted and Drowsy Driver - The extent of these two behaviors contributing to crashes is unknown due to under-reporting.

[3] Aggressive Driver - Aggressive driving is not recorded in WSDOT's Crashes Locations and Analysis database. The figures shown were derived based on the National Highway Traffic Safety Administration aggressive driving definition.

### Injury Definitions

**No Injury**: Applies when the officer at the scene has no reason to believe that at the time of the crash the person received any bodily harm due to the crash.

**Fatal**: When a person dies within 30 days from injuries sustained due to the crash.

**Serious**/Disabling: Any injury which prevents the injured person from walking, driving, or continuing normal activities at the time of the crash.

**Evident**/Non-Disabling: Any injury at the scene other than fatal or disabling.

**Possible**: Any injury reported to the officer or claimed by the individual such as momentary unconsciousness, limping, complaint of pain, nausea, hysteria, or a claim of injuries not evident.

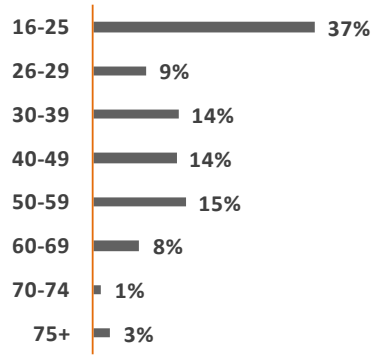
# Crash Analysis

## All Crashes

**768 total crashes 2005 - 2009**

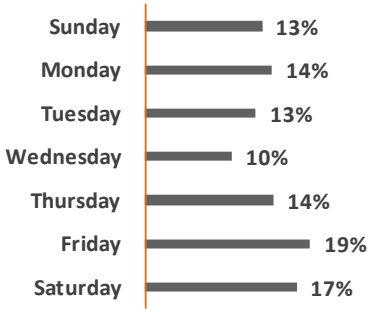
### Gender


### All age groups

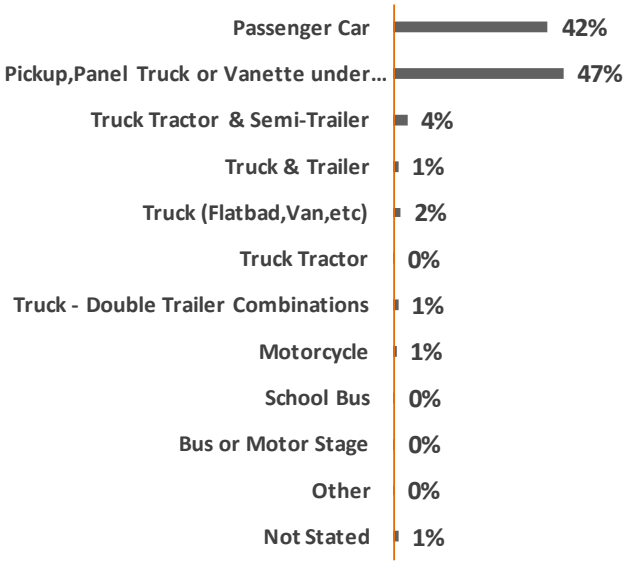



**Note:** The age group 26-29 includes only four distinct ages, while most of the other age groups consist of ten. At first glance this makes it appear that 26-29 year olds are not involved in as many crashes compared to others. In fact, driver's within this group follow 16-25 years olds as the most prone to be involved in a crash.

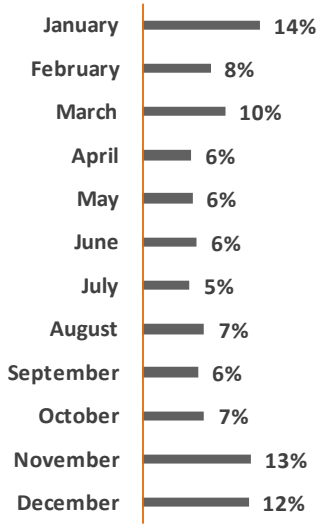
### Day of Week



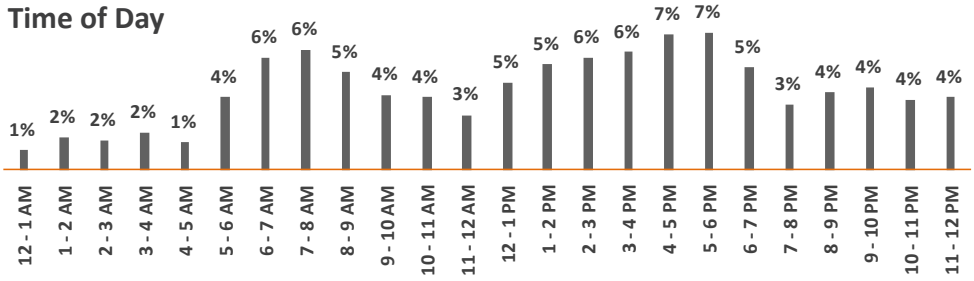

### Vehicles involved by type




### Month




### Time of Day



# Opposite Direction

## How are opposite direction crashes defined?

An opposite direction crash involves two or more vehicles moving in opposite directions, excluding intersection related crashes.

## US 195 opposite direction crash data: What did we learn?

From the available data we learned that:

| Five year study period | Count |
|---|---|
| All crashes | 768 |
| Opposite direction crashes | 71 |
| Fatal injury | 11 |
| Serious injury | 11 |

- Young drivers age 16 to 25 years represented a little more than 1/4 of all involved in this type of crash
- Of all vehicles involved 131 were moving straight ahead, 4 were passing, one was making a u-turn, and one changing lanes
- The majority of the crashes occurred on a straight roadway section, during daylight hours, with 51% on a snow, slush, ice, and/or wet roadway surface and a 48% on a dry roadway surface
- Incidents increased on Friday, Saturday, and Sunday
- Incidents increased during the noon to 7 PM time period

## US 195 opposite direction enforcement data: Washington State Patrol

Opposite direction crashes are not recorded as violations. No violation data is available.

The following table illustrates driver violations, excluding speeding, that increases the risk of an opposite direction crash. The violations include inappropriate passing, driving under the influence of alcohol/drugs, erratic lane travel, reckless or negligent driving, and cell phone use.

**Statewide**:
Between 2006 and 2008, Washington State experienced 860 serious injuries and 323 deaths related to opposite-direction multi-vehicles crashes. This represents 10.3% of serious injuries and 18.7% of fatalities during this period.

**US 195 study section:**
Between 2005 and 2009 opposite direction multi-vehicles crashes resulted in 23 serious injuries and 11 deaths. This represents 58% of all serious injuries and 65% of all fatalities during the study period.

# Opposite Direction

| Violation Name | Count |
|---|---|
| PASSING | 3037 |
| LANE TRAVEL | 1393 |
| CENTER LINE | 641 |
| ALCOHOL/DRUGS | 230 |
| RECKLESS/NEGLIGENT DRIVING | 123 |
| CELL PHONE -HANDHELD | 71 |

## US 195 opposite direction enforcement data: What did we learn?

Unlike crash data, violation trends likely reflect focused enforcement efforts. From the violations that represent driver behaviors that have been identified as leading to an increased risk for an opposite direction crash we learned that:

- Young drivers age 16 to 25 had the highest percentage of these behaviors compared to all age groups
- Male drivers made up almost 70%

## US 195 Public survey and opposite direction crash concerns: What did we learn?

The public's input regarding opposite direction crashes was captured in responses to various survey questions. From this survey we learned:

- Opposite direction crashes on the US 195 corridor is the number one concern of drivers (Question 4 and 5)
- Distracted, impaired, and speeding drivers ranked 3rd, 4th, and 5th, as concerns (Question 4 and 5).
- Responses to two open-ended questions state or imply drivers concerns regarding opposite direction crashes as follows:

Roadway design - the public stated a desire to have a four-lane facility, added passing lanes, and/or a median to divide the existing lanes.

Driver behavior - the public emphasized risky passing, aggressive drivers, slow moving vehicles, speeding, distracted, and impaired drivers as concerns.

Enforcement - the public supported increased enforcement for speeding, aggressive passing, distracted drivers, and slow moving vehicles.

Roadway operations - the public recommended a review of passing areas.

These concerns represent the public's desire to reduce potential vehicle conflict that can potentially contribute to crashes, including opposite direction crashes.

# Run-off-the-Road

## How are Run-off-the-Road (ROR) crashes defined?

A Run-off-the Road is defined as the first crash occurring outside the travelled way.

In other words, a ROR is any crash that results in a vehicle leaving the travelled way or lane and strikes an object or overturns. For example, a vehicle crosses the edge of the lane and onto the shoulder and strikes guardrail or continues beyond the pavement and strikes an earth bank, roadway ditch, sign post, fence, etc.

## US 195 ROR crash data: What did we learn?

From the available data we learned:

| Five year study period | Count |
|---|---|
| All crashes | 768 |
| Run-off-the-Road | 408 |
| Fatal injury | 5 |
| Serious injury | 6 |

- About 60% of the vehicles left the travelled way off to the right side of the road, while 40% crossed over centerline first and left the travelled way on the opposite side of the road
- Frequent contributing human factors were exceeding reasonable speed for conditions, drowsiness, distractions, and alcohol/drug involvement
- Young drivers age 16 to 25 represent almost one-half of all involved
- Most of the vehicles (385) involved were moving straight ahead, 15 were passing
- The majority of the ROR crashes occurred on a straight roadway section with ice/snow/slush/wet roadway surface
- Single vehicle crashes accounted for 385 of the 408 total
- Over one-half of the vehicles were pick-up truck or similar vehicle under 10,000 pounds
- Morning and afternoon commute times show a higher number of

**Statewide**: Between 2006 to 2008, Run-off-the-Road crashes contributed to 2,510 serious injuries and 722 deaths, or 30% of all serious injuries and 39% of all fatalities.

**US 195 study section**: Between 2005 and 2009, Run-off-the-Road crashes contributed to 8 serious injuries and 6 deaths, or 20% of all serious injuries and 35% of all fatalities.

# Run-off-the-Road

ROR events

- November, December, and January show increased occurrences
- One-half of all ROR crashes resulted in the vehicle striking an object, and 40% resulted in vehicle overturning. These two outcomes typically increase the chance of a serious injury

Based on the data findings, the address of ROR type crashes on this 80 mile segment of US 195 with appropriate low cost countermeasures emerges as a potential priority.

It is important to note, "exceeding reasonable speed for conditions" is often a contributing factor leading to crashes along this corridor. The identification of this human factor, begs the following questions for consideration:

1. How can we assist drivers with understanding the importance of adjusting driving speed based on changing weather conditions, regardless of the "posted speed limit"?
2. How can we assist drivers with making informed decisions about when to consider adjusting travel speed?

Another emerging factor was the vehicle type frequently involved in ROR crashes. Over one-half of all vehicles involved were in the van, panel or pick-up truck category. While, the data does not further distinguish if the vehicle was actually a van, panel or pick-up truck, based on the

## US 195 ROR enforcement data:
### Washington State Patrol

ROR crashes are not recorded as violations. No enforcement data is available.

The adjacent table illustrates driver behaviors that potentially could increase the risk of a ROR crash, excluding speeding. Violations such as inappropriate passing, driving under the influence of alcohol/drugs, improper lane travel, reckless or negligent driving, and cell phone use.

| Violation Name | Count |
|---|---|
| PASSING | 3037 |
| LANE TRAVEL | 1393 |
| SHOULDER | 664 |
| ALCOHOL/DRUGS | 230 |
| RECKLESS/NEGLIGENT DRIVING | 123 |
| CELL PHONE -HANDHELD | 71 |

## US 195 ROR enforcement data: What did we learn?

Unlike crash data, violation data trends likely reflect focused enforcement efforts. We learned the following about driver behaviors that have been identified as leading to an increased risk for ROR crashes:

- Young drivers age 16 to 25 represent the highest percentage with at-risk ROR violations compared to all age groups
- Male drivers were involved in 70% of at-risk ROR related violations

## US 195 Public survey and ROR crashes: What did we learn?

The public's input regarding ROR crashes on the corridor was captured in the responses to two survey questions. We learned the following:

- Survey respondents ranked ROR crashes 6th out of 15 concerns while driving US 195 (Question 4 and 5).

Although the term ROR was not explicitly used in responses to the open-ended survey questions, there were comments regarding drivers risky/aggressive behavior and poor passing decisions along with recommendations to provide additional passing lanes, merge/turn lanes, and pullouts that indirectly express concern about Run-Off-the-Road crashes.

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# Heavy Truck

## How are heavy truck crashes defined?

A crash involving a vehicle that weighs 10,000 lbs. or more, except buses and motor homes, is recorded as a heavy truck crash. Drivers of these vehicles must possess a commercial driver's license (CDL).

## US 195 heavy truck crash data: What did we learn?

From the available data we learned that:

| Five year study period | Count |
|---|---|
| All crashes | 768 |
| Heavy truck involved | 84 |
| Fatal injury | 6 |
| Serious injury | 6 |

- No contributing circumstances were attributed to the truck driver for any of the 6 fatal crashes involving a heavy truck
- The majority of crashes occurred on a straight roadway section, during daylight hours, on a dry roadway surface
- 13 of the 84 heavy truck crashes were intersection or driveway related
- A vehicle crossing over center line into the opposing lane of traffic occurred 26 times, of these vehicles crossing center line 73% were passenger cars, pick-up trucks, or motorcycles
- Two or more vehicles were involved in 75% of all crashes involving a heavy truck

## US 195 heavy truck enforcement data: What did we learn?

Based on the available data, enforcement of heavy truck violations focuses on equipment or driver regulations rather than individual driver behavior. Although overweight trucks, defective equipment, and driver fatigue can be a contributing factor in a crash, it is difficult to infer a correlation with the crash data.

**Statewide**: WSDOT data for 2006 shows that while heavy trucks were involved in only 5% of all minor injury crashes, they were involved in over 13% of all fatal crashes that year.
**US 195 study section**: Between 2005 and 2009 heavy trucks were involved in only 8% of all minor injury crashes, they were involved in over 38% of all fatal crashes during the study period

**Truck Drivers**
Of the 6 fatal crashes involving a heavy truck the contributing circumstances of all truck drivers involved were recorded as none. In each of these crashes the passenger vehicle crossed center line. Two of the passenger vehicle drivers had contributing circumstance of alcohol or drug related and two other passenger vehicle drivers were distracted.

# Heavy Truck

## US 195 Public survey and heavy trucks: What did we learn?

The public's input regarding heavy trucks on the corridor was captured in responses to various survey questions. From this survey we learned:

- While all heavy trucks do not travel at slow speeds, slow moving vehicles ranked 6th out of 15 concerns while driving US 195. The rolling hill terrain in the study section does have an impact on some heavy trucks maintaining the posted speed limit at all times
- In the open-ended questions concern about conflict with heavy trucks was presented 16 times, compared to concerns regarding slow moving cars (53 responses), and slow moving farm equipment (20 responses)

# Young Drivers

## How are crashes involving young drivers defined?

A young driver crash involves a driver between 16 and 25 years old.

## US 195 young driver crash data: What did we learn?

Young drivers, typically because of limited driving experience and maturity, are at greater risk of being involved in a crash. From the available data we learned that:

| Five year study period | Count |
|---|---|
| All crashes | 768 |
| Young driver involved | 340 |
| Fatal injury | 6 |
| Serious injury | 11 |

- Young drivers, age 16 to 25, comprised 28% of all drivers involved in fatal or severe injury crashes
- Exceeding a reasonable speed, not granting right-of-way, following too close, and distractions were the most common young driver error
- A young driver who was apparently asleep was recorded 30 times and fatigued 5 times
- Of all vehicles involved in the 340 crashes, 380 vehicles were moving straight ahead, 12 were passing, and 32 were turning
- 34 vehicles crossed the center line into the opposing lane of traffic
- The majority of these crashes occurred on a straight roadway section, during daylight hours, with a dry roadway surface
- 41 percent involved more than one vehicle
- Crashes increased during morning and afternoon commute times
- Crashes increased during November, December, and January
- Friday, Saturday, and Sunday show an increased number of crashes

**Statewide:** Young drivers were a factor in approximately 48% percent (828 of 1725) of all traffic deaths between 2006 and 2008.

**US 195 study section:** Young drivers were involved in 35% (6 of 17) of traffic deaths between 2005 and 2009.

# Young Drivers

## US 195 young driver enforcement data: What did we learn?

We learned the following from the 5 years of violation data:

- Young drivers account for 35% of all violations compared to all other age groups
- Speeding, improper passing, improper lane travel, following to close, driving on the shoulder or center line, and not wearing a safety belt are the leading driver behaviors that led to an enforcement officer initiating a stop
- The proportion of female drivers compared to male drivers is similar to the majority of the other Target Zero priorities

## US 195 Public survey and young drivers: What did we learn?

The public's input regarding young drivers on the corridor was captured in responses to survey questions From the survey we learned the following about driver concerns regarding young drivers on the corridor:

- Ranks 7th out of 15 concerns while driving US 195, question 4 and 5
- In the open-ended questions, concerns about young drivers is mentioned sixteen times

Also, compared to all those that responded to the survey, young drivers age 16 to 25 years participated the least.

# Drowsy Drivers

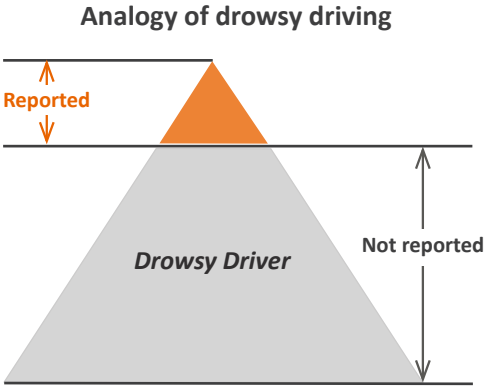
## How is drowsy driving defined?

A crash with an officer reported driver factor or contributing circumstance of apparently asleep or apparently fatigued is considered “drowsy driving”.

Some causes that can lead to drowsy driving include having one’s night sleep interrupted, insufficient hours of sleep for several nights in a row referred to as sleep debt, work schedules, sleep disorders, medication, alcohol, or a combination of these. Driving in this condition can result in vision problems, decreased awareness, aggressiveness, inattention, increased reaction time, and memory lapses similar to being under the influence of alcohol and drugs.

## Drowsy driving: What do we know?

The true size of the drowsy driving problem is unknown because crash data collected by crash investigators often under-report driver fatigued as a contributing factor.




There are several reasons for the under-reporting of drowsy or distracted driving as a crash factor. Unless a driver or a witness states that it was a factor, the investigator does not readily know. Some drivers simply do not admit to drowsy driving. Others may not be aware of the effect drowiness had on their driving so the crash was attributed to another factor. NCHRP Report 500 I-2

# Drowsy Drivers

**Statewide**: Between 2006-2008, drivers who were drowsy contributed to 77 (4.5%) of fatal crashes.

**US 195 study section**: Between 2005 and 2009, drivers who were drowsy contributed to 3 (18.8%) of fatal crashes.

## US 195 drowsy driving crash data: What did we learn?

The full impact of drowsy driving as a crash factor is unknown likely due to under-reporting. From the 5 years of crash data we learned:

| Five year study period | Count |
|---|---|
| All crashes | 768 |
| Drowsy driver involved | 66 |
| Fatal injury | 3 |
| Serious injury | 2 |

- Young drivers age 16 to 25 years represent over one-half of all drivers involved in a crash while driving drowsy
- Males made up 75% of all drowsy drivers involved
- 65% of drowsy driver related crashes occurred during daylight hours with a moderate peak between 6 - 7 AM
- Less than 10% of drowsy driver related crashes involved more than one vehicle

## US 195 drowsy driving enforcement data: Washington State Patrol

Enforcement data is not available for drowsy driving. Drowsy driving is not a behavior that can be readily measured. While tests are available to determine if a driver is under the influence of alcohol, currently there are no tests to determine if a person is fatigued.

## US 195 drowsy driving enforcement data: What did we learn?

Lane use violations, including shoulder driving or straddling the center line, is another violation that could in some cases be attributed to drowsy or distracted driving. Excluding speeding, lane use violations represent about 14% of all violations recorded during the study period.

# Drowsy Drivers

## US 195 Public survey and drowsy drivers: What did we learn?

The public's input regarding drowsy driving was captured in response to one survey question. From this survey we learned:

- 8% of all survey respondents said they often or very often drive while drowsy
- Almost 70% said they sometimes drive when fatigued

Drowsy driving was not mentioned in the open ended questions, perhaps for the same reason enforcement data does not capture this behavior. Typically, it is difficult or impossible to know if others on the road are fatigued to the point of diminished driving ability.

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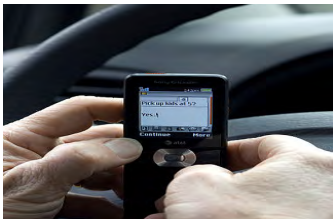
# Distracted



## How is a distracted driving crash defined?

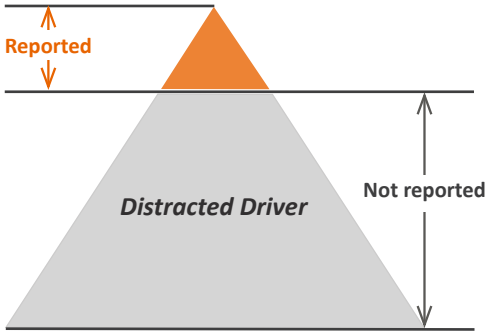
A distracted driving crash has an officer reported driver factor of inattentiveness or one or more distractions as follows:

Talking to passengers, using a cell phone to talk, sending a text, getting directions, eating, drinking, smoking, adjusting the radio, or reaching for something on the floor. Attention to driving can also be diminished by daydreaming, problem-solving, or worrying about problems.

## Distracted driving: What do we know?

"The true size of distracted driving ... [in crash outcomes] is unknown because crash data collected by crash investigators often under-reports driver distraction. In 2006, specific distraction items were added to Washington's Police Traffic Crash Report to better identify the types of distractions that contributed to crashes. Nonetheless, to select any of the 13 distraction items on the crash report, either the officer or an involved party needs to witness the distraction, or else it must be self-reported by the driver." **Washington State's Strategic Highway Safety Plan 2010: Target Zero**

**Analogy of distracted driving**




There are several reasons for under-reporting of distracted driving as a crash factor. Unless a driver or witness states that it was a factor, the investigator does not readily know. Some drivers know or don't admit it. Others may not be aware of the effect distractions had on their driving so the crash was attributed to another factor. **NCHRP Report 500 I-2**

# Distracted

## US 195 distracted driving crash data: What did we learn?

The full extent of distracted driving as a crash factor is unknown due to under-reporting. From the available data we have learned that:

| Five year study period | Count |
|---|---|
| All crashes | 768 |
| Distracted driver involved | 73 |
| Fatal injury | 2 |
| Serious injury | 2 |

**Statewide**: Between 2006 and 2008, distracted driving was a factor in 12.7% of serious injuries and 26.1% of all fatalities.

**US 195 study section**: Between 2005 and 2009, distracted driving was a factor in 8.7% of serious injuries and 12.5% of all fatalities.

- Young drivers age 16 to 25 represent almost one-half of all drivers involved in a crash and having a contributing circumstance of distracted
- Twenty-eight distracted drivers had additional contributing circumstances related to not obeying traffic laws
- The majority of distracted driving crashes occurred on a straight roadway section with a dry roadway surface during daylight hours
- Multiple vehicle crashes accounted for 29 of this 73 total
- Nineteen percent were intersection or driveway related
- Morning and afternoon commute times show a higher number of crashes involving distracted driving

## US 195 distracted driver enforcement data: What did we learn?

Distracted driving is likely occurring more frequently along the corridor than is reflected in the enforcement data.

The difference between the recorded data and the actual number of people driving distracted be attributed to the challenges in measuring distracted driving and recent changes in Washington State law. Originally, the Washington hands-free cell phone law, enacted July 1, 2008, supported hands-free enforcement as a secondary offense only.

The study data indicates 71 handheld cell phone violations, from 2008 to 2009 . The primary offense hands-free cell phone law, enacted in June 2010, was not in effect during the study period ( 2005 to 2009).

Other violations that could be related, in some cases, to distracted driving

involve lane use violations such as shoulder driving or straddling the center line. Excluding speeding, lane use violations represent about 14% of all violations recorded during the study period.

## US 195 Public survey and distracted drivers: What did we learn?

The public's input regarding distracted driving on the corridor was captured in the responses to several survey questions. As a result of the survey we learned the following about distracted driving:

- Respondents ranked distracted drivers as the 1st out of 10 concerns about other drivers' behavior
- 41% of all survey respondents reported they sometimes find themselves driving while distracted
- 6% of all survey respondents reported they often or very often find themselves driving while distracted
- Ranks 3rd out of 15 concerns while driving US 195 (Question 4/5)
- In the open-ended questions respondents presented about 20 concerns relating to distracted driving and the need for emphasized enforcement

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# Alcohol & Drugs

## How are alcohol and drug impaired driver related crashes defined?

In Washington, a driver is driving under the influence (DUI) if the driver's blood alcohol concentration is .08 or higher, if the driver is impaired by other drugs, or under the influence of both. This applies to both legal and illegal drugs, including prescription medication and over-the-counter drugs. Drivers under age 21 can be arrested for driving under the influence with a blood alcohol concentration of .02 or higher.

## US 195 Alcohol & Drugs crash data: What did we learn?

From the available data for Alcohol/Drug related crashes we learned:

| Five year study period | Count |
|---|---|
| All crashes | 768 |
| Alcohol, drugs, or medication involved | 36 |
| Fatal injury | 5 |
| Serious injury | 2 |

- Exceeding reasonable speed or speeding was an additional contributing circumstance in about one-third of crashes
- Young drivers age 16 to 25 accounted for 25% of all drivers involved in a crash while driving impaired
- Male drivers significantly outnumbered female drivers that were involved in alcohol/drug related crashes
- The majority of these crashes occurred on a dry roadway surface, during low light conditions, with equal crash occurrences on straight and curved roadway sections
- None of the crashes were related to intersections or driveways
- Eight vehicles crossed the center line into the opposing lane of travel
- About one-half of the crashes involved more than one vehicle
- Friday and Saturday had the highest percentage of crashes
- Midnight to 4 AM show a higher number of crashes

**Statewide**: Alcohol or drug-impaired drivers were a factor in approximately 48% percent (828 of 1725) of all traffic deaths between 2006 and 2008.
**US 195 study section**: Alcohol or drug-impaired drivers were a factor in 35% (6 of 17) of traffic deaths between 2005 and 2009.

# Alcohol & Drugs

## US 195 Alcohol & Drugs enforcement data: What did we learn?

We learned the following from the 5 years of violation data:

- There were 327 alcohol or drug related violations
- Alcohol related account for 237 violations, 192 of these were people driving impaired/under the influence
- Of the 90 drug related violations 26 people were impaired/under the influence
- Young drivers age 16 to 25 represent one-third of all alcohol/drug related violations
- Male drivers significantly outnumbered female drivers
- There were a similar number of violations each weekday and a notable increase on Friday and Saturday
- Violations started to increase in the early evening hours and peaked around midnight

## US 195 Public survey alcohol & drug impaired drivers: What did we learn?

The public's input regarding impaired drivers on the corridor was captured in the responses to two survey questions. As a result of the survey we learned the following about alcohol or drugs related crashes:

- Responding drivers ranked "impaired drivers" as the 4th of 15 concerns while driving US 195 (Question 4 and 5)
- In the open-ended question driving under the influence of alcohol or drugs is mentioned five times as a stated concern

# Aggressive Drivers

## How is aggressive driving defined?

The National Highway Traffic Safety Administration (NHTSA) defines aggressive driving as, "The commission of two or more moving violations that is likely to endanger other persons or property, or any single intentional violation that requires a defensive reaction of another driver."

Some behaviors associated with aggressive driving include exceeding the posted speed limit, following too closely, erratic or risky lane changes, improper passing, not granting right-of-way, improperly signaling lane changes, failure to obey stop signs, yield signs, traffic signals etc).

Road rage differs from aggressive driving. Road rage is a criminal offense and is "an assault with a motor vehicle or other dangerous weapon by the operator or passenger(s) of one motor vehicle on the operator or passenger(s) of another motor vehicle or is caused by an incident that occurred on a roadway." **National Highway Traffic Safety Agency, Aggressive Driving Enforcement Strategies for Implementing Best Practices (2000)**

## Aggressive driving: What do we know?

**Statewide Facts** - Aggressive driving is a contributing circumstance that is not recorded in the Crash Locations and Analysis System (CLAS) database. No statewide information on is available. **Washington State's Strategic Highway Safety Plan 2010: Target Zero**

## US 195 aggressive driving crash data: What did we learn?

From the available data about possible aggressive driving we learned:

| Five year study period | Count |
|---|---|
| All crashes | 768 |
| Potentially aggressive driver involved | 124 |
| Fatal injury | 2 |
| Serious injury | 7 |

- Young drivers age 16 to 25 years account for almost 40% of the aggressive drivers
- The majority of possible aggressive driver related crashes occurred on a straight roadway section, during daylight hours, on a dry roadway surface
- 35% were within Colfax City limits

The aggressive driver fails to consider the human element involved. The anonymity of being behind the wheel gives aggressive drivers a false sense of control and power; therefore, they seldom take into account the consequences of their actions. **NHTSA**

# Aggressive Drivers

- Of all vehicles involved 154 were moving straight ahead, 45 were turning, and 11 were passing
- The aggressive driving increased during morning, mid-morning and afternoon commute times
- Friday and Saturday show an increased incidence

**Enforcement**
Aggressive drivers is one of Washington State Patrol's four major enforcement focus areas. Seat belt and child car seat use, unrestrained vehicle occupants, speeding, and driving under the influence of alcohol/drugs are the four major areas that significantly impact public safety.

## US 195 aggressive driving enforcement data: : What did we learn?

From the available data about possible aggressive driving we learned that:

- Young drivers age 16 - 25 represent a significant percentage of aggressive driving compared to all other age groups

## US 195 Public survey and aggressive drivers: What did we learn?

The public's input regarding aggressive drivers was captured in responses to several questions. From the survey we learned:

- Aggressive drivers is mentioned 152 times in the open-ended questions in the form of passing in an aggressive way and aggressive behavior, in general
- Concerns about other driver's behaviors ranks frequent passing, following to close, ignoring traffic rules, and speeding as the most prominent issues that can be defined as one element indicating an aggressive driver

# Speeding

## How are crashes resulting from a speeding driver defined?

A crash involving a driver traveling too fast for conditions or exceeding the posted speed limit.

Driving too fast for conditions, occurs when a driver is unable to stop a vehicle or negotiate obstacles while driving at or under the posted speed limit. Road construction work zones, heavy traffic, adverse weather are environments when driving under the speed limit could still be considered too fast for conditions or exceeding reasonable speed.

## US 195 speeding crash data : What did we learn?

From the available data for speeding related crashes we learned:

| Five year study period | Count |
|---|---|
| All crashes | 768 |
| Driving to fast for conditions or exceeding speed limit | 296 |
| Fatal injury | 3 |
| Serious injury | 4 |

- Male drivers outnumbered female speeding drivers
- Young drivers age 16 to 25 account for almost one-half of all the drivers who were involved in a crash while speeding
- Of all vehicles involved, 310 were moving straight ahead, 21 were passing, 6 were turning, 14 were legally stopped in traffic
- The majority of these crashes occurred on a straight roadway section, during daylight, with a roadway surface of ice/snow/slush/wet
- Sixty-seven of the speeding related crashes involved more than one vehicle
- Twenty-eight vehicles crossed the center line into the opposing lane of travel
- Over one-half of the vehicles were a pick-up truck or similar vehicle under 10,000 pounds
- Crashes peaked during the morning and afternoon commute times, with 6 AM to 9 AM having the a higher number of crashes

**Statewide**: Between 2006-2008, over 40% of all fatal crashes and 30% of all serious injury crashes involved speeding.

**US 195 study section**: Between 2005 and 2009, over 18% of all fatal crashes and 17% of all serious injury crashes involved speeding.

# Speeding

- Friday, Saturday, Sunday, and Monday show an increased incidence of speeding related crashes

**Enforcement Focus**
Speeding drivers is one of Washington State Patrol's four major enforcement focus areas. Speeding along with aggressive driving, seat belt use, and driving under the influence of alcohol/ drugs are the four major areas that significantly impact public safety.

## US 195 speeding enforcement data: What did we learn?

Unlike crash data, violation trends likely reflect focused enforcement efforts. From the 5 years of violation data we learned:

- There were 26,261 speeding related violations
- Young drivers age 16 to 25 represent one-third of all speeding violators
- Male speeding drivers outnumbered female speeding drivers by 2 to 1
- There were a similar number of violations each weekday and an increase on Friday and Saturday
- Speeding violations started to increase in the early evening hours and peaked around midnight
- Violations began increasing in the AM commute hours and peaked between 2 PM to 5 PM

## US 195 public survey and speeding drivers: What did we learn?

The public's input regarding speeding drivers on the corridor was captured in responses to survey questions. From the survey we learned that speeding:

- Ranks 5th out of 15 concerns while driving US 195 (Question 4 /5)
- Ranks 4th out of 11 concerns about other drivers' behavior
- 67% of the respondents reported they sometimes find themselves speeding
- 15% of respondents reported they often or very often find themselves speeding
- In the open-ended question speeding is mentioned as a stated concern and as opportunity for emphasized enforcement
- Twenty-four people suggested increasing the speed limit

# Unlicensed Drivers

## How are crashes involving an unlicensed driver defined?

This type of crash involves a driver with suspended or revoked license status in Washington or any other state.

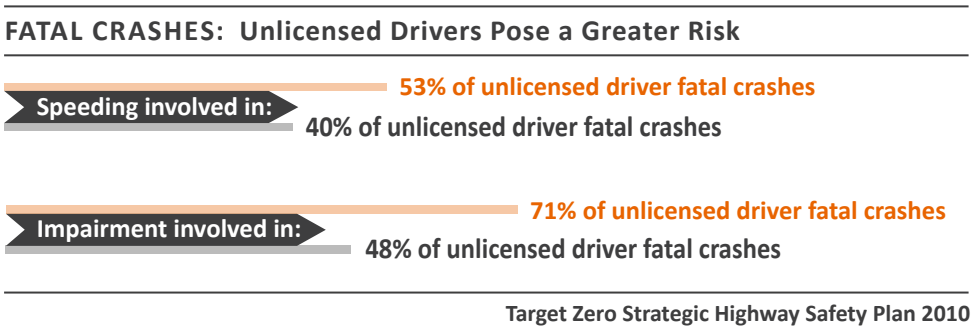
## US 195 unlicensed driver crash data: Not available

Why is serious injury data not available for unlicensed drivers? "Unlike the factors presented in the other chapters of Target Zero, license status data is not captured in WSDOT's crash database. Driver identification numbers are captured, but 21% of those numbers for serious injury crashes from 2003 through 2008 could not be matched to DOL's driver identification numbers, and only suspended and revoked data could be matched to serious injury crashes. Because the serious injury data is not complete, it will not be presented ..." **Washington State's Strategic Highway Safety Plan 2010: Target Zero**

## Causes of serious crashes involving unlicensed drivers

Most of the fatal crashes involving an unlicensed driver have similar causes compared to the fatal crashes involving drivers with valid licenses. However, the unlicensed drivers were involved at higher percentage rates.

- Impairment was factor in 71% of the unlicensed driver fatal crashes, compared to 48% of the licensed driver crashes
- Speeding was a factor in 53% of the unlicensed driver fatal crashes, compared to 40% of the licensed driver crashes
- Impairment and speeding were often co-occurring causes in fatal crashes, whether involving unlicensed or licensed drivers




Unrestrained vehicle occupants, distracted drivers, and young drivers were also factors that often co-occurred. Speed and impairment, also co-occurred in fatal crashes involving unlicensed drivers. **Washington State's Strategic Highway Safety Plan 2010: Target Zero**

# Unlicensed Drivers

## US 195 unlicensed driver enforcement data: What did we learn?

From the 5 years of violation data we learned:

- There were 289 violations related to a person operating a vehicle with a revoked or suspended drivers license and another 43 violations that resulted in a criminal infraction
- Young drivers age 16 to 25 years made up 41% of the unlicensed driver violations
- Male drivers significantly outnumbered female drivers with unlicensed driver violations

Driver without a valid license is a secondary offense. An unlicensed driver is typically identified as the result another violation such as speeding, following to close, distracted driving or operating defective equipment.

## US 195 Public survey and unlicensed drivers: What did we learn?

The public's input regarding unlicensed drivers on the corridor is captured in responses to two questions. From the survey we learned that unlicensed drivers:

- Ranks 12th out of 15 concerns while driving US 195 (Question 4/5)

# Intersections


## How are Intersection related crashes measured?

An intersection related crash occurs at or near an intersection and involves a driver making intersection related maneuvers.

## US 195 Intersection crash data: What did we learn?

All driver behaviors can potentially contribute to intersection crashes. We learned the following from the intersection related crash data:

| Five year study period | Count |
|---|---|
| All crashes | 768 |
| Intersection related | 108 |
| Fatal injury | 0 |
| Serious injury | 4 |

- There were no intersection related fatal crashes during the five year study period. The most recent two outside the study period occurred 2001 and a second in 2011
- Forty percent of the contributing circumstances was the driver "not granting right-of-way", basically an error in the driver judgement or a disregard/misunderstanding of the rules of the road
- Young drivers 16 to 25 years accounted for over 1/3 of all drivers involved in intersection related crashes
- Males represented a little over 1/2 of those involved
- The majority of intersection related crashes occurred on a straight roadway section, during daylight hours, with a road surface of dry
- Two or more vehicles were involved in 91% of intersection related crashes
- Intersection related crashes peaked between noon to 2 PM and 3 to 6 PM

**Statewide:** Intersection related crashes in Washington State resulted in 2,916 serious injuries and 356 fatalities, 35% of all serious injuries and 21% of fatalities between 2006 and 2008

**US 195 study section:** Intersection related crashes on this study section resulted in 6 serious injuries and no fatalities, 15% of all serious injuries and 0% of all fatalities between 2005 and 2009.

# Intersections

## US 195 Intersection enforcement data: What did we learn?

From the 5 years of violation data we learned:

- There were 159 intersection related violations
- Young drivers 16 to 25 years were involved in 25% of intersection related violations
- Drivers 40 to 49 years were involved in 28% of intersection related violations
- In a 2:1 ratio male drivers were involved in more intersection related crashes than female drivers
- Violations peaked between 7 to 8 AM, noon to 1 PM, and 3 - 4 PM

## US 195 Public survey and Intersections: What did we learn?

The public's input regarding intersection on the corridor was captured in the responses to several survey questions. As a result of the survey we learned the following about concerns regarding intersection related crashes:

- As a level of concern intersections ranked 8$^{th}$ out of 15 from question 4 and 5
- From the open-ended questions the public discussed intersections in several ways, stating a need for grade separated interchanges, modifying intersection control such as adding signals, and general concerns about how intersections within the study section operate

# Unrestrained

## How are unrestrained related crash defined?

An unrestrained crash involves a vehicle occupant that was not restrained by a seat belt or child car seat.

## US 195 unrestrained occupant crash data: What did we learn?

From the available data we learned:

| Five year study period | Count |
|---|---|
| All crashes | 768 |
| Unrestrained occupant | 4 |
| Fatal injury | 1 |
| Serious injury | 0 |

Although the low number of unrestrained vehicle occupant crashes indicate this is not an issue on US 195, the violation data shows that this behavior persists and is an appropriate priority to continue addressing.

## US 195 unrestrained occupant enforcement data: What did we learn?

From the 5 years of violation data we learned the following about unrestrained vehicle occupants:

- There were 667 unrestrained vehicle occupant violations, 17 of these were a child restraint violation
- Young drivers age 16 to 25 years represent 1/3 of all unrestrained vehicle occupant violations
- 4 of 5 drivers who did not use a restraint or ensure a passenger was restrained were male
- Violations increased during the AM and PM commute hours, this likely reflects focused enforcement effort

## US 195 Public survey and unrestrained occupants: What did we learn?

The public's input regarding unrestrained vehicle occupants was captured in responses to two survey questions. From the survey we learned that unrestrained vehicle occupants:

- Ranks 12th out of 15 concerns while driving US 195 (Question 4 /5)
- About 4% of the respondents shared the fact that they don't use seat a belt either very often, often, or just sometimes

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# Older Drivers

## How are crashes involving older drivers defined?

It is any crash involving a driver who is 75 years or older.

## US 195 older driver crash data: What did we learn?

Based on the crash data that included all contributing factors we learned that:

| Five year study period | Count |
|---|---|
| All crashes | 768 |
| Older driver involved | 29 |
| Fatal injury | 3 |
| Serious injury | 1 |

- Of all vehicles involved, 33 were moving straight ahead, 10 were turning, and none were passing
- A high percentage of older driver crashes were intersection related
- There was no contributing factor in almost 60% of the older driver related crashes
- Not granting right-of-way and apparently asleep were the most common driver error in older driver related crashes
- Over 50% of the older driver related crashes involved more than one vehicle
- Most of the crashes occurred on a straight roadway section, during daylight hours, with a dry roadway surface
- There was an increase in crashes during the afternoon commute period from 3- 5 PM
- Monday and Tuesday show an increased incidence

## US 195 older driver enforcement data: What did we learn?

Age is a driver attribute and includes all driver behaviors that led to a violation. From the 5 year violation data we learned:

- Older drivers account for 1% of all violations compared to all other age groups
- Speeding, passing, improper lane travel, driving on the shoulder

### Age and Injury

Per mile traveled, fatal crash rates increase starting at age 75 and increase notably after age 80. This is largely due to increased susceptibility to injury and medical complications among older drivers rather than an increased tendency to get into crashes. **Centers for Disease Control and Prevention**

**Statewide**: Between 2006 and 2008, older road users accounted for 120 (7.0%) of traffic fatalities.
**US 195 study section:** Between 2005 and 2009, older road users accounted for 3 (17.6%) of traffic fatalities.

# Older Drivers

or center line, and not wearing a safety belt are the leading driver behaviors that led to an enforcement officer initiating a stop for older drivers, similar to young drivers

- Older male drivers accounted for a significant percentage of violations compared to older female drivers

### US 195 Public survey and older drivers: What did we learn?

The public's concern regarding older drivers was not readily evident from the survey responses.

# Wildlife

## How are wildlife crashes determined?

A crash involving a non-domestic animal is deemed a wildlife crash.

## US 195 wildlife crash data: What did we learn?

From the available data regarding wildlife crashes we learned:

| Five year study period | Count |
|---|---|
| All crashes | 768 |
| Wildlife crash | 85 |
| Fatal injury | 0 |
| Serious injury | 0 |

**Statewide**: Wildlife crashes accounted for nine fatalities (0.5%) between 2006 and 2008

**US 195 study section**: Wildlife crashes accounted for no fatalities (0.0%) between 2005 and 2009.

- There was a higher percentage of wildlife related crashes during October, likely related to increased deer movement during the breeding season
- 85% of wildlife related crashes occurred during dark or low light conditions
- There was a significant increase in wildlife related crashes during evening hours between 5 PM and 11 PM.
- 50% of all wildlife crashes occurred in the vicinity of milepost 26 near Pullman to milepost 41 near Dry Creek Road, about 15 miles of the 80 mile study section

## US 195 wildlife enforcement data: Washington State Patrol

Wildlife crashes are not recorded as violations. No violation data is available.

## US 195 Public survey and wildlife crashes: What did we learn?

The public's input regarding crashes with wildlife was captured in responses to two survey questions. From this survey we learned the following regarding wildlife crashes:

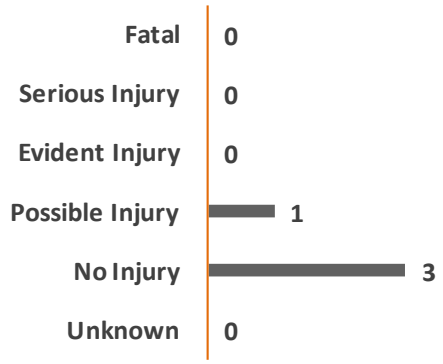
- Concerns regarding wildlife related crashes was mentioned six times in the open-ended questions

# Priorities: 10 or less crashes

| Target Zero Priority | Number of vehicles involved | Injury severity |
|---|---|---|

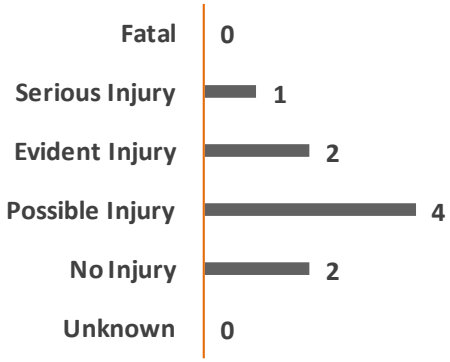
## School bus related

| Number of Crashes | Number of Vehicles Involved |
|---|---|
| 1 | 🚗 |
| 3 | 🚗🚗 |
| | 7 |



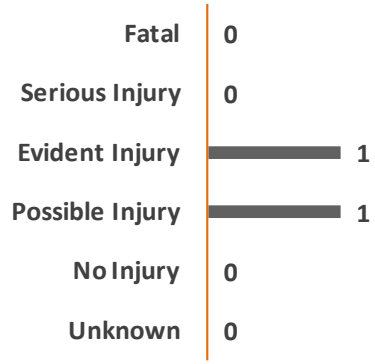

## Work Zone

| Number of Crashes | Number of Vehicles Involved |
|---|---|
| 2 | 🚗 |
| 7 | 🚗🚗 |
| | 16 |




## Bicyclist Involved

| Number of Events | Number of Vehicles Involved |
|---|---|
| 2 | 🚗 |
| 1 | Not known |
| | |




## Vehicle - Train Involved

**None**

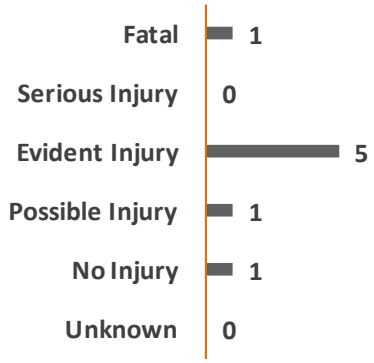
# Priorities: 10 or less crashes

**Target Zero Priority** | **Number of vehicles involved** | **Injury severity**

## Motorcyclist

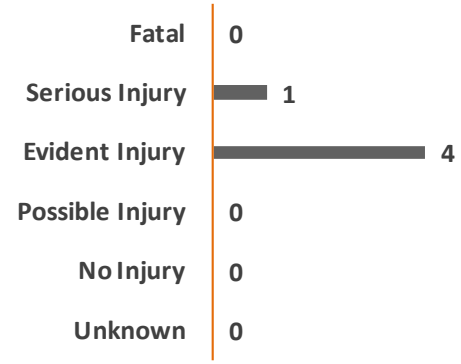
| Number of Events | Number of Vehicles Involved |
|---|---|
| 4 | |
| 4 | |
| | 8 4 |

Six Helmet Used, 1 Helmets not used, 1 Unknown




## Pedestrian Involved

| Number of Events | Number of Vehicles Involved |
|---|---|
| 5 | |
| | 5 |
| | |



# Countermeasures

## What is a countermeasure?

A countermeasure is an action taken to prevent an undesirable outcome. The term countermeasure also implies an optimal action.

## What do I need to know about the countermeasures presented in this study?

Many of the potential countermeasures presented in this study were defined by US 195 crash trends, enforcement data and public input. Other countermeasures are of a broader scope and were identified through existing research.

The countermeasures presented here are not intended to be a comprehensive list, but rather a starting point for becoming familiar with a variety of possible strategies that can help accomplish the goal of reducing serious and fatal crashes along the US 195 corridor study section.

## How effective are the listed countermeasures?

The effectiveness of the potential countermeasures listed in this study range from proven effective, likely to be effective, unknown, and conditional.

Some of the measures have been proven by research, others have less supporting research but are likely to be effective, and some have received little research attention and their effectiveness is simply not known.

How effective a countermeasure is can also depend on how it is implemented. The best countermeasure may have little effect if it is not appropriately implemented.

## Are any of the countermeasures currently used on US 195?

Yes, many of the countermeasures presented in this study are already being successfully implemented on the corridor.

Washington State Patrol, WSDOT, Washington Traffic Safety Commission, local emergency responders, and others apply countermeasures daily along the corridor as part of their mission.

For example, Washington Traffic Safety Commission among many other things is actively involved in funding and producing public service announcements that we see or hear every day.

## Why are implemented countermeasures listed?

Implemented countermeasures are listed because for some it might be possible to improve their effectiveness by collaborating and leveraging resources.

## What else needs to be done?

There is an opportunity to further refine and prioritize this list to identify the most cost effective countermeasures to implement in either the short-term or long-term.

Also, as new partnerships develop, additional countermeasures will be identified and may be included in future plans.

## How is the countermeasure list organized?

The list is organized by the 4E's: Enforcement, Education, Engineering, and Emergency Medical Services. Each countermeasure was matched to the applicable Target Zero priority based on where the study data indicated the most benefit might be realized.

The crash data, public input, violation data, although subjective in some cases, was the basis for matching a countermeasure to a priority.

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# Enforcement

## Potential Countermeasures - *Funding Dependent*

Noted priorities are mainly based on US 195 study data

▲ = Primary application of countermeasure

△ = Secondary application of countermeasure

| | Target Zero Priorities | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Driver Behavior | | | | | | | Age | | Crash Type | | | | | | | | | | | | |
| | Alcohol/Drug | Speeding | Unrestrained | Distracted | Unlicensed | Drowsy | Aggressive | Older Drivers | Young Drivers | Run-off-Road | Intersection | Opposite | Motorcycle | Pedestrian | Heavy Truck | Work Zone | Wildlife | Bicyclist | Vehicle Train | School Bus |
| Use Eastern Washington's Target Zero Prosecutor or Traffic Safety Resource Prosecutor (TSRP) program to assist local prosecutors and law enforcement on legal issues. The programs staff assist with difficult impaired driving cases by aiding with trial preparation, predicate questions, case review, briefing preparation, research of novel legal issues, or serving as second chair at trial. Staff will also respond to queries from law enforcement and other stakeholders on recent law changes, defense challenges and court procedures, and provide a variety of legal trainings. | ▲ | | | | | | | | | △ | | △ | | | | | | | | | | |
| Continue/Increase high visibility enforcement/media campaigns to target distracted drivers on US 195. Particularly drivers that disregard Washington State hands-free wireless device law. Potential partners may include Washington State Patrol, Washington Traffic Safety Commission, County Target Zero task forces and WSDOT. | | | | ▲ | | | | | △ | △ | | | | | | | | | | | | |
| Continue/Increase high visibility enforcement efforts that target drivers who are exceeding reasonable speed for roadway conditions such as wet, snow/ slush, icy, reduced visibility, and in work zones. | | ▲ | | | | | | | △ | △ | | | | | | | | | | | | |
| Identify drivers with an unusual number of citations and crashes related to aggressive driving behaviors, then educate and/or impose sanctions. Partners could include local traffic courts, Washington State Patrol, Whitman County Sheriff, and Spokane County Sheriff. | | △ | | | | | ▲ | | △ | | | | | | | | | | | | | |
| Limit diversion and plea agreements for impaired driving offenders. | ▲ | | | | | | | | | | | | | | | | | | | | | |
| Continue to explore opportunities to increase well-planned enforcement/ media campaigns focused on drivers that: Are aggressive, impaired, don't adjust to road conditions and continue to exceed reasonable speeds, or are drowsy. | ▲ | ▲ | | | | ▲ | ▲ | | | | | | | | | | | | | | | |

# Enforcement

## Potential Countermeasures - *Funding Dependent*

Noted priorities are mainly based on US 195 study data

▲ = Primary application of countermeasure

△ = Secondary application of countermeasure

| | Target Zero Priorities | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Driver Behavior | | | | | | | Age | | Crash Type | | | | | | | | | | | |
| | Alcohol/Drug | Speeding | Unrestrained | Distracted | Unlicensed | Drowsy | Aggressive | Older Drivers | Young Drivers | Run-off-Road | Intersection | Opposite | Motorcycle | Pedestrian | Heavy Truck | Work Zone | Wildlife | Bicyclist | Vehicle Train | School Bus |
| Expand the partnership between Washington State Patrol and WSDOT for addressing Target Zero priorities. Schedule regular meetings with the purpose of identifying potential engineering/enforcement countermeasures that can reduce crashes or mitigate the severity of crash outcomes. | Potentially all priorities | | | | | | | | | | | | | | | | | | | | |
| Similar to red light cameras explore opportunities to use speed cameras for automated speed enforcement on the US 195 corridor. Two Washington State pilot projects were completed in 2012. The final report "Automated Speed Enforcement Pilot Project Evaluation" prepared by the Washington Traffic Safety Commission was submitted to the Legislature in January 2013. | | ▲ | | | | | | | △ | △ | | | | | | | | | | | |
| Increase commercial truck inspections on US 195 during winter months to ensure truckers are properly equipped for adverse weather conditions. | | | | | | | | | | | | | | | ▲ | | | | | | |
| Conduct well publicized enforcement campaigns aimed at underage drinking parties. Pullman, Moscow, Colfax, Colton, Rosalia, and Liberty High Schools, WSU, University of Idaho, Washington State Patrol, Idaho State Police, and County Sheriffs. | | | | | | | | | ▲ | | | | | | | | | | | | |
| Encourage external reporting of older at-risk drivers to licensing authorities. At-risk drivers would be those with diminished vision, cognition, and motor function. | | | | | | | | ▲ | | | △ | | | | | | | | | | |

# Education

## Potential Countermeasures - *Funding Dependent*

Noted priorities are mainly based on US 195 study data

▲ = Primary application of countermeasure

△ = Secondary application of countermeasure

| | Target Zero Priorities | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Driver Behavior | | | | | | | Age | | Crash Type | | | | | | | | | | | | |
| | Alcohol/Drug | Speeding | Unrestrained | Distracted | Unlicensed | Drowsy | Aggressive | Older Drivers | Young Drivers | Run-off-Road | Intersection | Opposite | Motorcycle | Pedestrian | Heavy Truck | Work Zone | Wildlife | Bicyclist | Vehicle Train | School Bus |
| Establish a community based traffic safety task force. The role of this task force would be to plan and advocate for strategies from the 4E's: Education, Enforcement, Emergency medical services, and Engineering. Refer to the "Community Task Force" section of this document. | Potentially all priorities | | | | | | | | | | | | | | | | | | | | | |
| Identify funding opportunities for targeted priorities. Funding is available for local governments and organizations through two statewide grant programs, one from the Washington Traffic Safety Commission (WTSC) and one from the Washington State Department of Transportation (WSDOT). The WTSC Federal Grant process funds behavioral change projects. | Potentially all priorities | | | | | | | | | | | | | | | | | | | | | |
| Conduct mock crash dramatizations at local high schools and colleges. Mock crashes dramatize fatal and serious injury crashes with student actors, fire departments, law enforcement, and MedStar helicopters. This is followed by memorial services with eulogies and counselors being made available for students as needed. Mock crash programs have been successfully conducted at several Spokane high schools. | △ | | | | | | | | ▲ | △ | | | | | | | | | | | | |
| Establish an annual "US 195 Safe Driving Week" that gives local communities an opportunity to raise awareness for all US 195 users and to highlight at risk young drivers and the challenges of rural highway driving. Partners could include Washington Traffic Safety Commission, County Target Zero Safety Tasks Forces, Washington State Patrol, and WSDOT. Venues for the "US 195 Safe Driving Week" could include the Whitman and Spokane County Fairs, other community events, and schools. | | △ | △ | △ | | △ | △ | | ▲ | △ | | | | | | | | | | | | |

# Education

## Potential Countermeasures - *Funding Dependent*

Noted priorities are mainly based on US 195 study data

▲ = Primary application of countermeasure

△ = Secondary application of countermeasure

| | Target Zero Priorities | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Driver Behavior | | | | | | | Age | | Crash Type | | | | | | | | | | | | |
| | Alcohol/Drug | Speeding | Unrestrained | Distracted | Unlicensed | Drowsy | Aggressive | Older Drivers | Young Drivers | Run-off-Road | Intersection | Opposite | Motorcycle | Pedestrian | Heavy Truck | Work Zone | Wildlife | Bicyclist | Vehicle Train | School Bus |
| Expand "Zero Tolerance for Alcohol" education for drivers under the age of 21 and parents or guardians, with the purpose of reinforcing the Zero Tolerance law and the consequences of non-compliance. Partners should include Pullman, Colfax, Colton, Rosalia, and Liberty high schools, WSU, University of Idaho. | ▲ | | | | | | | | △ | △ | | △ | | | | | | | | | | |
| Utilize Spokane County Target Zero Task Force's expertise. Their mission is to identify traffic safety needs and guide investment decisions to achieve reductions in traffic fatalities and disabling injuries on all public roads. Spokane County Traffic Safety Task Force should be considered a lead partner. | Potentially all priorities | | | | | | | | | | | | | | | | | | | | | |
| Launch the “Every 15 Minutes" program in local high schools. "Every 15 Minutes" program offers dramatization of real-life experiences without the real-life risks. Every 15 minutes a student is removed from the classroom and asked not to talk to or interact with the other students for the duration of the exercise as if he/she were deceased. | △ | | | | | | | | ▲ | △ | | | | | | | | | | | | |
| Local communities could leverage existing programs such as the National Highway Traffic Safety Administration "Speed Shatters Life" public service advertising campaign. Get local media involved by demonstrating the importance of this issue for the residents of local communities. Other potential partners might include Washington Traffic Safety Commission and County Target Zero task forces. | | ▲ | | | | | | | △ | △ | | △ | | | | | | | | | | |
| Look for opportunities to increase parental involvement in driver education. | △ | △ | | △ | | △ | △ | | ▲ | △ | | | | | | | | | | | | |
| Promote "Pledge Not to Text & Drive" Programs. Current programs are available through wireless carriers and insurance companies. | | | | ▲ | | | | | △ | △ | | | | | | | | | | | | |

# Education

## Potential Countermeasures - *Funding Dependent*

Noted priorities are mainly based on US 195 study data

▲ = Primary application of countermeasure

△ = Secondary application of countermeasure

| | Target Zero Priorities | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Driver Behavior | | | | | | | Age | | Crash Type | | | | | | | | | | | | |
| | Alcohol/Drug | Speeding | Unrestrained | Distracted | Unlicensed | Drowsy | Aggressive | Older Drivers | Young Drivers | Run-off-Road | Intersection | Opposite | Motorcycle | Pedestrian | Heavy Truck | Work Zone | Wildlife | Bicyclist | Vehicle Train | School Bus |
| Promote mandatory attendance at DUI Victims Panels for all DUI offenders. Partner with Spokane and Whitman Counties where those panels are already in place. DUI victim panels give offenders an opportunity to hear the stories of real victims of drunk driving, gaining a new perspective on their DUI case. | ▲ | | | | | | | | △ | | | △ | | | | | | | | | | |
| Promote the use of safe driving agreements or contracts between young drivers and parents/guardians. | | | | ▲ | | | | | △ | △ | | | | | | | | | | | | |
| Promote the use of smartphone applications (apps) that have a drive mode to automatically silence notification sounds of incoming texts, e-mails, and phone calls. One such smartphone app includes an incentive of gift certificates for safe driving. Explore establishing a locally based incentive program. | | | | ▲ | | | | | △ | △ | | | | | | | | | | | | |
| Raise awareness of the intermediate license law restrictions among young drivers and their guardians. Collaborate with Colfax, Pullman, Moscow, Rosalia, Liberty, and Colton high schools and other groups associated with drivers 18 or younger. Emphasize the success of this law and the reduction of serious injury crashes among young drivers. | | | | | | | | | ▲ | △ | | | | | | | | | | | | |
| Use roadside variable message signs to remind drivers of the importance of adjusting to changing weather conditions. Exceeding reasonable speed for conditions adverse weather is evident from the US 195 crash data. | | ▲ | | | | | | | | △ | | | | | | | | | | | | |
| Use/expand the existing WSU program that targets habitual offenders of the minors in possession (MIP) ordinance by taking away privileges e.g. parking, sports activities, etc. Make WSU's counseling services a mandatory part of the process. | △ | | | | | | | | ▲ | | | | | | | | | | | | | |

# Education

## Potential Countermeasures - *Funding Dependent*

Noted priorities are mainly based on US 195 study data

▲ = Primary application of countermeasure

△ = Secondary application of countermeasure

| | Target Zero Priorities | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Driver Behavior | | | | | | | Age | | Crash Type | | | | | | | | | | | | |
| | Alcohol/Drug | Speeding | Unrestrained | Distracted | Unlicensed | Drowsy | Aggressive | Older Drivers | Young Drivers | Run-off-Road | Intersection | Opposite | Motorcycle | Pedestrian | Heavy Truck | Work Zone | Wildlife | Bicyclist | Vehicle Train | School Bus |
| Create, expand, improve, and market the alternative ride “Home Safe Program” and the designated driver programs. Target all age groups. | ▲ | | | | | | | | | | | | | | | | | | | | | |
| Leverage the expertise of Mothers Against Drunk Drivers (MADD) | ▲ | | | | | | | | △ | △ | | | | | | | | | | | | |
| Develop an interactive road information and safety culture among the US 195 corridor drivers and in adjacent communities using social media and existing agency electronic communications such as WSDOT variable message signs, Spokane and Pullman airports, university web pages, and other sources. | △ | △ | △ | △ | | △ | △ | | | | | | | | | | | | | | | |
| Emulate the Youth Court Program currently in existence at Cheney high school. | | | | | | | | | ▲ | | | | | | | | | | | | | |
| Enlist college and high school journalism students and faculty to investigate and write about US 195, it's local users, the cost of crashes for local communities, young driver risks, rural highway driving, safe driving skills. | △ | △ | | △ | | △ | △ | | ▲ | | | | | | | | | | | | | |
| Explore ways to remind college students of the risks of driving while fatigued particularly after mid-term/final testing periods. There are students who hit the road for school breaks immediately after long study and testing periods without sufficient sleep. Encourage proper rest prior to travelling. Partner with colleges to ask parents via the school website, robocalls, and e-mail to encourage children to " start the trip home the next day". | | | | | | ▲ | | | △ | △ | | | | | | | | | | | | |

# Education

## Potential Countermeasures - *Funding Dependent*

Noted priorities are mainly based on US 195 study data

▲ = Primary application of countermeasure

△ = Secondary application of countermeasure

| | Target Zero Priorities | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Driver Behavior | | | | | | | Age | | Crash Type | | | | | | | | | | | | |
| | Alcohol/Drug | Speeding | Unrestrained | Distracted | Unlicensed | Drowsy | Aggressive | Older Drivers | Young Drivers | Run-off-Road | Intersection | Opposite | Motorcycle | Pedestrian | Heavy Truck | Work Zone | Wildlife | Bicyclist | Vehicle Train | School Bus |
| Fund and produce a Target Zero safety video that presents identified Target Zero priorities on the US 195 corridor. This video can help raise highway safety awareness and help guide investment decisions for reducing serious and fatal crashes. The video can be distributed within communities on US 195 and viewed at any number of venues. The "Traffic Safety Successes on the Colville Reservation" which highlights the successful application of Target Zero principles is an award winning production example. | △ | △ | △ | △ | △ | △ | △ | △ | ▲ | | | | | | | | | | | | |
| Implement measures/programs developed by the Washington Traffic Safety Commission's Young Driver Task Force in coordination with Washington State University, University of Idaho, Pullman, Moscow, Colfax, Colton, Rosalia, and Liberty High Schools. | | | | | | | | | ▲ | | | | | | | | | | | | |
| Initiate workplace education programs that raise awareness of distracted and drowsy driving risks. This effort could be included in a company's existing safety program. | | | | ▲ | | ▲ | | | | △ | | | | | | | | | | | |
| Produce public service announcements with local residents in conjunction with Washington State Patrol, Whitman and Spokane County Sheriffs, emergency responders, etc. | ▲ | ▲ | ▲ | ▲ | | ▲ | ▲ | | ▲ | | | | | | | | | | | | |
| Provide roadside variable message signs (VMS) to deter aggressive driving. Messages such as "Share the Road", "Respect the Speed", "Choose Safety for Life", "Be Patient, be a Follower", and "Report Aggressive Drivers." Communicating with US 195 travellers through variable message signs is a 'real-time' low cost way to share safe driving reminders that can help drivers modify their behaviors choices. | | △ | | | | | ▲ | | △ | | | | | | | | | | | | |

# Education

## Potential Countermeasures - *Funding Dependent*

Noted priorities are mainly based on US 195 study data

▲ = Primary application of countermeasure

△ = Secondary application of countermeasure

| | Target Zero Priorities | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Driver Behavior | | | | | | | Age | | Crash Type | | | | | | | | | | | | |
| | Alcohol/Drug | Speeding | Unrestrained | Distracted | Unlicensed | Drowsy | Aggressive | Older Drivers | Young Drivers | Run-off-Road | Intersection | Opposite | Motorcycle | Pedestrian | Heavy Truck | Work Zone | Wildlife | Bicyclist | Vehicle Train | School Bus |
| Secure a virtual driving simulator. This gives individual drivers first hand experience that helps them better understand the risks involved with distracted driving, speeding, and impaired driving. The simulator can be utilized at high schools, colleges, county fairs and other community events. | △ | △ | | ▲ | | | △ | | △ | △ | | | | | | | | | | | | |
| Use targeted messages on variable message signs to remind drivers to not drive distracted. Messages such as "One Text or Call Could WRECK IT ALL." Texting & Driving: "It Can Wait", "No Texting While Driving It's the Law". Partner with colleges to market, to include messages on web pages, and provide public service announcements to deter distracted. | | | | ▲ | | | | | △ | △ | | | | | | | | | | | | |
| Develop appropriate messages and methods to reach all segments of the population but target groups who have a higher incidence of driving while impaired. Locations for this effort could include workplace safety meetings, WSU, University of Idaho, and local high schools. | ▲ | | | | | | | | △ | △ | | △ | | | | | | | | | | |
| Further promote and look for ways to increase young drivers interest in WSU's "Safe Winter Driving: Avoiding the Skids" program. | | | | | | | | | ▲ | | | | | | | | | | | | | |
| Educate drivers about the inherent limitations of four-wheel drive vehicles during certain winter road surface conditions. | | | | | | | | | | ▲ | | | | | | | | | | | | |
| Coordinate with Spokane International Airport for the purpose of using current and future on-site systems to provide information to inbound travelers. Variable message signs and mobile device applications could be used to alert US 195 bound travelers about changing roadway conditions, estimated drive times, current road construction and in addition too share safe driving reminders and other appropriate public service announcements. | | △ | | △ | | △ | | | | ▲ | | | | | | | | | | | | |

# Education

## Potential Countermeasures - *Funding Dependent*

Noted priorities are mainly based on US 195 study data

▲ = Primary application of countermeasure

△ = Secondary application of countermeasure

| | Target Zero Priorities | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Driver Behavior | | | | | | | Age | | Crash Type | | | | | | | | | | | |
| | Alcohol/Drug | Speeding | Unrestrained | Distracted | Unlicensed | Drowsy | Aggressive | Older Drivers | Young Drivers | Run-off-Road | Intersection | Opposite | Motorcycle | Pedestrian | Heavy Truck | Work Zone | Wildlife | Bicyclist | Vehicle Train | School Bus |
| Invite guest speakers from the Greater Spokane Substance Abuses organization to speak at schools. | ▲ | | | | | | | | △ | △ | | | | | | | | | | | |
| Conduct well publicized compliance checks at alcohol retailers to reinforce state law regarding underage persons buying alcohol. Request additional Washington State Liquor Board inspections to make sure vendors are doing due diligence. | ▲ | | | | | | | | △ | △ | | △ | | | | | | | | | |
| Develop partnerships that work with high schools students to enhance or establish education programs related to impaired driving. Collaborate with parents, enforcement officers and emergency medical service personnel to discuss risky behaviors | | | | | | | | | ▲ | | | | | | | | | | | | |
| Explore opportunities to include information about rural driving skills and the consequences of high risk behaviors in existing forums at Washington State University and University of Idaho. | | △ | △ | △ | | △ | △ | | ▲ | △ | | | | | | | | | | | |
| Leverage existing college programs such as WSU's ALIVE! Orientation/ registration program to target young drivers at WSU and U of I student orientations and provide education about high risk driving behaviors and the misconceptions of rural highway driving. | △ | △ | | △ | | △ | △ | | ▲ | | | | | | | | | | | | |
| Raise awareness of the Ticketing Aggressive Cars and Trucks (TACT) program which combats unsafe driving around commercial motor vehicles. The mission of this program is to educate car and truck drivers on how to share the road safely. | | | | | | | | | | | | △ | | | ▲ | | | | | | |

# Education

## Potential Countermeasures - *Funding Dependent*

Noted priorities are mainly based on US 195 study data

▲ = Primary application of countermeasure

△ = Secondary application of countermeasure

| | Target Zero Priorities | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Driver Behavior | | | | | | | Age | | Crash Type | | | | | | | | | | | | |
| | Alcohol/Drug | Speeding | Unrestrained | Distracted | Unlicensed | Drowsy | Aggressive | Older Drivers | Young Drivers | Run-off-Road | Intersection | Opposite | Motorcycle | Pedestrian | Heavy Truck | Work Zone | Wildlife | Bicyclist | Vehicle Train | School Bus |
| Leverage existing safe driver education aimed at young drivers. For example, making education material readily available to local schools that discuss high risk behaviors. Behaviors such as driving to fast for conditions, being distracted, driving drowsy, and aggressive are leading contributing factors among young drivers on the US 195 study section. Develop grass-root programs that address young driver behaviors and are potentially eligible for Washington Traffic Safety Commission's and Spokane County Target Zero Task force grants, and County Target Zero Task force programs which target young drivers. | | | | | | | | | ▲ | | | | | | | | | | | | | |
| Place public service announcements about safe driving on the big screen at sporting events. | | | | | | | | | | ▲ | | | | | | | | | | | | |
| Share messages using variable message signs that alert drivers to slow moving vehicles and the need to share the road. Seasonal harvest times for example. | | | | | | | | | | ▲ | △ | | | | | | | | | | | |
| Use roadside variable message signs to remind drivers of the "Click it or Ticket" law and the importance of all vehicle occupants using proper restraints. This includes child safety seats and seat belts. | | | ▲ | | | | | | | | | | | | | | | | | | | |
| Conduct area wide education combined with targeted enforcement of distracted driving laws. . | | | | ▲ | | | | | | | | | | | | | | | | | | |

# Education

## Potential Countermeasures - *Funding Dependent*

Noted priorities are mainly based on US 195 study data

▲ = Primary application of countermeasure

△ = Secondary application of countermeasure

| | Target Zero Priorities | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Driver Behavior | | | | | | | Age | | Crash Type | | | | | | | | | | | |
| | Alcohol/Drug | Speeding | Unrestrained | Distracted | Unlicensed | Drowsy | Aggressive | Older Drivers | Young Drivers | Run-off-Road | Intersection | Opposite | Motorcycle | Pedestrian | Heavy Truck | Work Zone | Wildlife | Bicyclist | Vehicle Train | School Bus |
| Explore ways to enhance and improve existing programs along the US 195 corridor that raise awareness of aggressive driving and its consequences. Potential partners are citizen action groups, Washington Traffic Safety Commission, County Traffic Safety Commissions and local media. As an example, provide radio public service announcements during morning and afternoon commute times. | | | | | | | ▲ | | | | | | | | | | | | | | |
| Identify and contact trucking companies that use the US 195 corridor with the aim of having their drivers and trucks adequately prepared for adverse winter road conditions. | | | | | | | | | | | | | | | ▲ | | | | | | |
| Improve communication with US 195 travelers via intelligent transportation system technologies (ITS) such as variable message signs (VMS) and RSS feeds that allows drivers to adjust travel plans to changing road conditions. Develop an "Interactive Corridor" that alerts drivers to possible delays due to adverse weather, university events, seasonal harvest, and roadway construction for example. | | △ | △ | △ | | △ | △ | | ▲ | | | | | | | | | | | | |
| Look for opportunities to raise awareness that not adjusting speeds to changing road conditions is a significant contributing factor to US crash on US 195 crashes. Additional focus toward young drivers should be explored. For example, invite local law enforcement and emergency responders to speak with young drivers at Colfax High School, WSU, and University of Idaho. | | △ | △ | △ | △ | △ | △ | ▲ | ▲ | | | | | | | | | | | | |
| Share US 195 crash facts with establishments that serve alcohol so they can better understand the consequences impaired driving has on local residents. | ▲ | | | | | | | | | △ | | △ | | | | | | | | | |

# Engineering

## Potential Countermeasures - *Funding Dependent*

Noted priorities are mainly based on US 195 study data

▲ = Primary application of countermeasure

△ = Secondary application of countermeasure

| | Target Zero Priorities | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Driver Behavior | | | | | | | Age | | Crash Type | | | | | | | | | | | | |
| | Alcohol/Drug | Speeding | Unrestrained | Distracted | Unlicensed | Drowsy | Aggressive | Older Drivers | Young Drivers | Run-off-Road | Intersection | Opposite | Motorcycle | Pedestrian | Heavy Truck | Work Zone | Wildlife | Bicyclist | Vehicle Train | School Bus |
| Implement an on-going corridor safety process to identify priorities, strategies, countermeasures, establish reduction goals, and periodically re-evaluate the same. This would be carried out by a task force modeled after or established through the Washington Traffic Safety commission's Local Traffic Safety Task Force program. See the Development of a Community Based Task Force section of this document for additional details. | Potentially all priorities | | | | | | | | | | | | | | | | | | | | | |
| Modify roadway delineation by widening the standard 4 inch lane edge line to 6 - 8 inches. This is a proven low cost countermeasure that has the potential to reduce run-off-the-road crashes. | | | | | | | | | | ▲ | | | | | | | | | | | | |
| Maintain roadway delineation. Consider increasing the maintenance cycle of applying the lane edge line. | | | | | | | | | | ▲ | | | | | | | | | | | | |
| Install center line rumble strips. Center line rumble strips are a proven countermeasures that has a significant cost to benefit ratio. This countermeasure has been implemented along the entire 80 mile study section. | | | | | | | | | | △ | | ▲ | | | | | | | | | | |
| Install shoulder rumble strips where appropriate. This is a proven low cost countermeasure that has good potential to reduce run-off-the-road crashes. This countermeasure has been implemented at several locations along the 80 mile study section. | | | | | | | | | | ▲ | | | | | | | | | | | | |
| Perform a site distance survey to catalog existing passing/no-passing zones and compare to appropriate design standards. Make changes to the existing passing/no-passing signs and roadway paint striping as necessary based on the survey findings. This countermeasure has been implemented along the entire 80 mile study section. | | | | | | | | | | △ | | ▲ | | | | | | | | | | |

# Engineering

## Potential Countermeasures - *Funding Dependent*

Noted priorities are mainly based on US 195 study data

▲ = Primary application of countermeasure

△ = Secondary application of countermeasure

| | Target Zero Priorities | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Driver Behavior | | | | | | | Age | | Crash Type | | | | | | | | | | | | |
| | Alcohol/Drug | Speeding | Unrestrained | Distracted | Unlicensed | Drowsy | Aggressive | Older Drivers | Young Drivers | Run-off-Road | Intersection | Opposite | Motorcycle | Pedestrian | Heavy Truck | Work Zone | Wildlife | Bicyclist | Vehicle Train | School Bus |
| Modify ditches and back slopes to minimize crash severity. An engineering study would be needed to identify areas for this treatment based on design standards and crash history. | | | | | | | | | | ▲ | | | | | | | | | | | | |
| Modify road side slopes to reduce snow drifting onto the travelled way. WSDOT maintenance has applied this countermeasure at a limited number of areas and it has proven successful. | | | | | | | | | | ▲ | | | | | | | | | | | | |
| Consider dynamic speed limits signs for changing posted speed limits during adverse roadway conditions. | | ▲ | | | | | | | | △ | | △ | | | | | | | | | | |
| Construct additional Road Weather Information Systems (RWIS) for enhanced data collection. This will assist WSDOT maintenance with focusing efforts at appropriate locations during adverse weather conditions. This data will be disseminated through the existing Transportation Management Center system to all user of US 195 including Spokane International Airport, Washington State University, and University of Idaho for example. This allow US 195 users adjust travel plans. | | | | | | | | | | ▲ | | | | | | | | | | | | |
| Increase the number of closed-circuit television cameras to be used by the Traffic Management Center to monitor roadway conditions and share up-to-date information with users of US 195. | | | | | | | | | | ▲ | | | | | | | | | | | | |
| Plant living snow fences to reduce snow drifting onto the travelled way. Living snow fences are a proven countermeasure with a significant cost to benefit ratio in comparison to other snow fence measures. Addressing areas on US 195 prone to drifting snow will reduce maintenance efforts and roadway closures. | | | | | | | | | | ▲ | | | | | | | | | | | | |

# Engineering

## Potential Countermeasures - *Funding Dependent*

Noted priorities are mainly based on US 195 study data

▲ = Primary application of countermeasure

△ = Secondary application of countermeasure

| | Target Zero Priorities | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Driver Behavior | | | | | | | Age | | Crash Type | | | | | | | | | | | | |
| | Alcohol/Drug | Speeding | Unrestrained | Distracted | Unlicensed | Drowsy | Aggressive | Older Drivers | Young Drivers | Run-off-Road | Intersection | Opposite | Motorcycle | Pedestrian | Heavy Truck | Work Zone | Wildlife | Bicyclist | Vehicle Train | School Bus |
| Provide additional passing opportunities by constructing passing lanes at locations identified by an engineering analysis shown to have the potential to reduce crashes and to address drivers expectations for passing opportunities along an 80 mile corridor. | | | | | | | | | | △ | | ▲ | | | | | | | | |
| Modify guardrail. This countermeasure has been implemented along the entire 80 mile study section. | | | | | | | | | | ▲ | | | | | | | | | | |
| Use additional, larger, and more reflective curve warning signs and chevrons. | | | | | | | | | | ▲ | | | | | | | | | | |
| Use mobile speed trailers and static radar feedback signs to alert drivers to their actual speed and the posted speed. To increase effectiveness mobile radar speed feedback signs can be intermittently used in conjunction with the Washington State Patrols enforcement. | | ▲ | | | | | | | △ | △ | | | | | | | | | | |
| Evaluate the viability of modifying existing speed limits by conducting a speed study. This study can help determine if posted speed limits are accepted as reasonable by most drivers. Reducing excessive speed differences between vehicles has the potential to reduce conflict due to risky passing and following to close for example. | | △ | | | | | ▲ | | △ | | | | | | | | | | | |
| Identify operational factors that might be triggers for frustration and aggressive driving. Potential partners are WSP, Whitman County Sheriff, and WSDOT. | | △ | | | | | ▲ | | △ | | | | | | | | | | | |
| Modify roadway delineation by using a more durable and higher reflective paint line product for the roadway center and edge lines. | | | | | | | | | | | | ▲ | | | | | | | | |
| Study the feasibility of high friction road surface treatments on horizontal curves that have been prone to ROR or opposite direction crashes. | | | | | | | | | | ▲ | | △ | | | | | | | | |

# Engineering

## Potential Countermeasures - *Funding Dependent*

Noted priorities are mainly based on US 195 study data

▲ = Primary application of countermeasure

△ = Secondary application of countermeasure

| | Target Zero Priorities | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Driver Behavior | | | | | | | Age | | Crash Type | | | | | | | | | | | | |
| | Alcohol/Drug | Speeding | Unrestrained | Distracted | Unlicensed | Drowsy | Aggressive | Older Drivers | Young Drivers | Run-off-Road | Intersection | Opposite | Motorcycle | Pedestrian | Heavy Truck | Work Zone | Wildlife | Bicyclist | Vehicle Train | School Bus |
| Create a separation between opposing lanes with a painted median or channelization along sections of US 195 based on opposite direction crash history, existing roadway cross-section, and the potential for crash reduction. | | | | | | | | | | | | ▲ | | | | | | | | |
| Implement the 2+1 road design concept. In this design, the existing two wide lanes and shoulders are converted to three narrow lanes with a cable barrier down the center line. The center lane alternates between traffic directions at regular intervals to provide passing opportunities. | | | | | | | | | | | | ▲ | | | | | | | | |
| Modify roadway guide and/or regulatory signs. Consider reintroducing no passing signs that coincide with no pass striping. | | | | | | | | | | | | ▲ | | | | | | | | |
| Modify visibility of intersections by providing enhanced signing and delineation. | | | | | | | | △ | | | ▲ | | | | | | | | | |
| Leverage WSDOT's existing Maintenance Accountability Process program (MAP) by incorporating crash data to prioritize certain maintenance services that have the potential to reduce some crash types. Current MAP measurables that could be used are lane striping, snow/ice removal, condition of signs, and guardrail. | | | | | | | | | | ▲ | | | | | | | | | | |
| Potentially reduce driver impatience typically related to slower moving vehicles by placing additional signs advising drivers of passing zones ahead at 3 miles, 2 miles, and 1 mile for example. Targeted behaviors are following to close and high risk or illegal passing. | | | | | | | ▲ | | | | | | | | | | | | | |
| Construct or widen existing turnouts to encourage use by drowsy drivers and cellphone users. | | | | ▲ | | ▲ | | | △ | △ | | | | | | | | | | |
| Modify access to safe stopping areas and safety rest areas. | | | | | | ▲ | | | △ | △ | | | | | | | | | | |
| Provide Wi-Fi at rest areas to encourage drowsy drivers to stop and take a break. | | | | | | ▲ | | | △ | △ | | | | | | | | | | |

# Engineering

## Potential Countermeasures - *Funding Dependent*

Noted priorities are mainly based on US 195 study data

▲ = Primary application of countermeasure

△ = Secondary application of countermeasure

| | Target Zero Priorities | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Driver Behavior | | | | | | | Age | | Crash Type | | | | | | | | | | | | |
| | Alcohol/Drug | Speeding | Unrestrained | Distracted | Unlicensed | Drowsy | Aggressive | Older Drivers | Young Drivers | Run-off-Road | Intersection | Opposite | Motorcycle | Pedestrian | Heavy Truck | Work Zone | Wildlife | Bicyclist | Vehicle Train | School Bus |
| Study the viability of wind vortexes to reduce snow drifting onto the travelled way. | | | | | | | | | | ▲ | | | | | | | | | | |
| Transit: Establish a coalition of partners to address older adults transportation needs to and from Spokane by improving accessibility, frequency, and affordability. | | | | | | | | ▲ | | △ | | | | | | | | | | |
| Transit: Establish a broad-based coalition to address and coordinate the transportation needs of young people to and from Spokane, by developing ways to modify accessibility, frequency, and more affordable of public transportation. | | | | | | | | ▲ | | | | | | | | | | | | |
| Transit: Expand commute trip reduction programs and expand transit networks within the region. | | △ | | △ | | △ | △ | | | △ | | | | | | | | | | |
| Transit: Provide transit mobility choices in communities so unlicensed drivers have a viable alternative for necessary trips. | | | | | ▲ | | | | | | | | | | | | | | | |
| Transit: Get impaired drivers off the road by supporting alternative transportation services such as transit, designated drivers programs, and taxi rides home programs. | ▲ | | | | | | | | | | | | | | | | | | | |
| Transit: Expand and market area transit services to increase young and older peoples ridership. The purpose is to reduce single vehicle trips made by these at risk groups. | | | | | | | | ▲ | ▲ | | | | | | | | | | | |
| Install animal crossing signs. Consider signs with solar-powered flashing lights. | | | | | | | | | | | | | | | | | ▲ | | | |
| Modify deer crossing behavior with barrier fencing. | | | | | | | | | | | | | | | | | ▲ | | | |

# Emergency Medical Services

## Potential Countermeasures - *Funding Dependent*

Noted priorities are mainly based on US 195 study data

▲ = Primary application of countermeasure

△ = Secondary application of countermeasure

| | Target Zero Priorities | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Driver Behavior | | | | | | | Age | | Crash Type | | | | | | | | | | | | |
| | Alcohol/Drug | Speeding | Unrestrained | Distracted | Unlicensed | Drowsy | Aggressive | Older Drivers | Young Drivers | Run-off-Road | Intersection | Opposite | Motorcycle | Pedestrian | Heavy Truck | Work Zone | Wildlife | Bicyclist | Vehicle Train | School Bus |
| Assist EMS volunteers with the expense associated with continuing education and recertification. | | | | | | | | | | | | | | | | | | | | | | |
| Secure funding for the purchase of new or replacement equipment for local EMS organizations. For example, air lifting bags which are used to stabilize vehicles while attending crash victims. | | | | | | | | | | | | | | | | | | | | | | |
| Increase the number of volunteers that are certified to EMT - Intermediate level. At this level the responder is trained for supraglottic airway placement and intraosseous infusion placement. | | | | | | | | | | | | | | | | | | | | | | |
| Fund the purchase of emergency treatment jump kit bags for emergency responders to have at the ready during off-duty hours. The content of a Jump kit can vary. They contain supplies such as a stethoscope, multi-trauma dressings, and saline flushes. | | | | | | | | | | | | | | | | | | | | | | |
| Provide FHWA 2012 Training for first responders for multi-discipline Traffic Incident Management (TIM) | | | | | | | | | | | | | | | | | | | | | | |
| Provide a full-time Emergency Medical Technician (EMT) in Rosalia. The Rosalia area of US 195 has been identified as a priority for increased emergency medical response services. | | | | | | | | | | | | | | | | | | | | | | |
| Modify communication between EMS, law enforcement, and fire service agencies with the purchase of 700 to 800 megahertz radio equipment. | | | | | | | | | | | | | | | | | | | | | | |
| Increase the available pool of Emergency Medical Responders (EMR) to insure sufficient response at injury crashes. | | | | | | | | | | | | | | | | | | | | | | |

Potentially all priorities

Emergency Medical Services provided by first responders is a post-crash measure that works to reduce the trauma sustained by crash victims. The medical care provided can be the difference between a serious and potentially fatal injury.

This care is especially important in rural areas because of the time needed to transport a victim to a hospital.

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# Appendix


Data ..... A-1
Community Based Task Force ..... B-1
Emergency Medical Services ..... C-1
Safety Rest Areas ..... D-1
Intelligent Transportation Systems ..... E-1
Adverse Weather & Climate Change..... F-1
Roadway Geometry ..... G-1
Public Transportation ..... H-1

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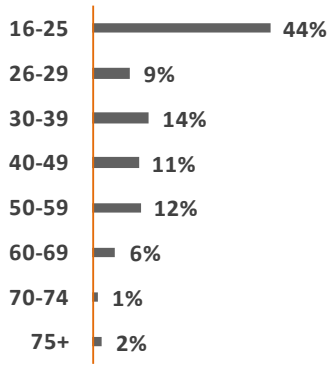
# Run-off-the-Road

## US 195 ROR crash data:

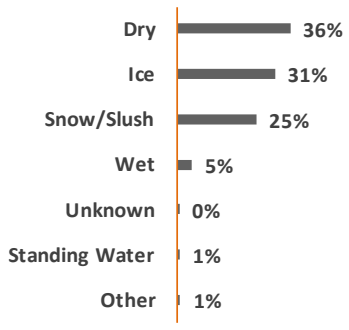
| Failure to Obey Traffic Laws/Aggressive | Driver of 1st | 2nd | 3rd |
|---|---|---|---|
| Exceeding Reasonable Safe Speed | 224 | 1 | 0 |
| Exceeding Stated Speed Limit | 8 | 0 | 0 |
| Improper Passing | 6 | 0 | 0 |
| Did Not Grant Right-of-Way to Vehicle | 1 | 0 | 0 |
| Disregard Stop Sign - Flashing Red | 1 | 0 | 0 |
| Improper Backing | 1 | 0 | 0 |
| **Distraction Type** | | | |
| Inattention | 35 | 0 | 0 |
| Other Driver Distractions Inside Vehicle | 3 | 0 | 0 |
| Driver Interacting with Passengers, Animal | 2 | 0 | 0 |
| Driver Adjusting Audio or Entertainment | 1 | 0 | 0 |
| Driver Distractions Outside Vehicle | 1 | 0 | 0 |
| Driver Eating or Drinking | 1 | 0 | 0 |
| **Impairment** | | | |
| Under Influence of Alcohol | 16 | 0 | 0 |
| Under Influence of Drugs | 3 | 0 | 0 |
| Had Been Drinking - Sobriety Unknown | 3 | 0 | 0 |
| Had Taken Medication | 2 | 0 | 0 |
| Had Been Drinking - Ability Not Impaired | 1 | 0 | 0 |
| **Drowsy/Illness** | | | |
| Apparently Asleep | 57 | 0 | 0 |
| Apparently Fatigued | 7 | 0 | 0 |
| Apparently Ill | 6 | 0 | 0 |

### Age

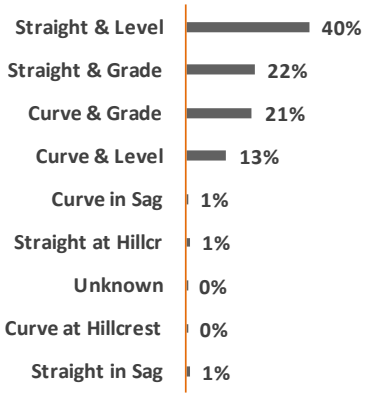



### Gender

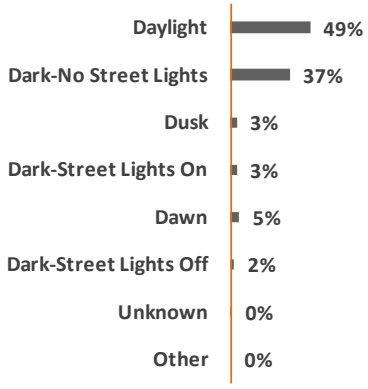

### Roadway Surface




### Roadway character

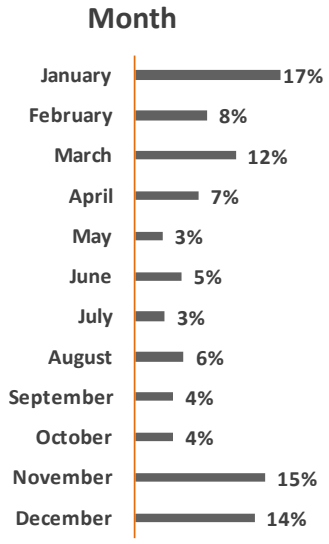


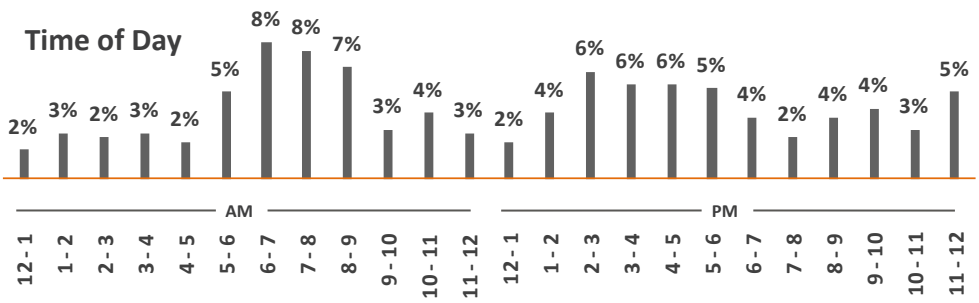

### Light condition

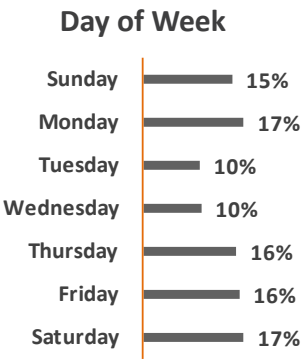


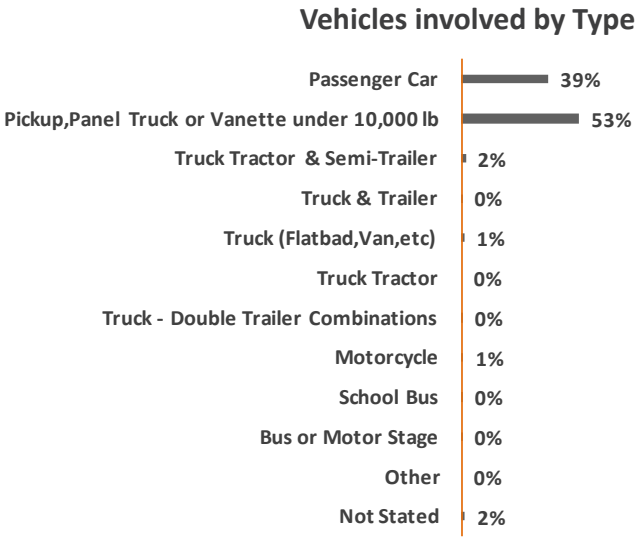
# Run-off-the-Road

## US 195 ROR crash data:



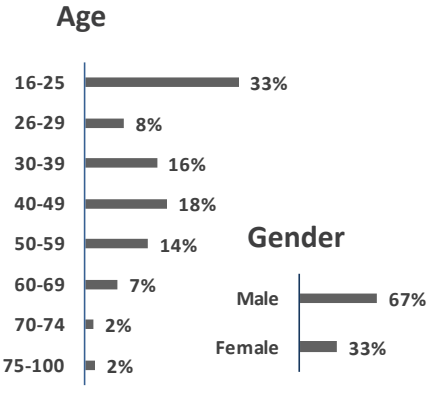




## US 195 ROR enforcement data:

ROR crashes are not recorded as violations. No enforcement data is available.

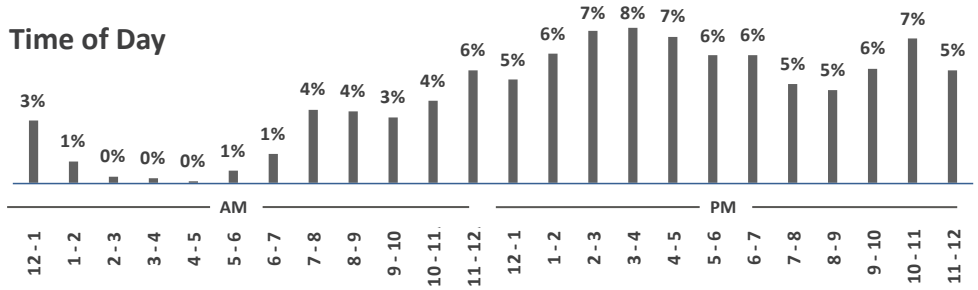
The following illustrates driver behaviors that could potentially increase the risk of a ROR crash, excluding speeding. Violations such as inappropriate passing, driving under the influence of alcohol/drugs, improper lane travel, reckless or negligent driving, and cell phone use.

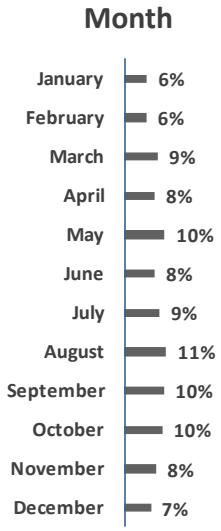
| Violation Name | Count |
|---|---|
| PASSING | 3037 |
| LANE TRAVEL | 1393 |
| SHOULDER | 664 |
| ALCOHOL/DRUGS | 230 |
| RECKLESS/NEGLIGENT DRIVING | 123 |
| CELL PHONE -HANDHELD | 71 |

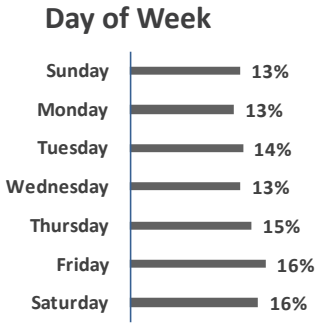


# Run-off-the-Road

## US 195 ROR enforcement data:




See Section “Community Engagement” for survey data

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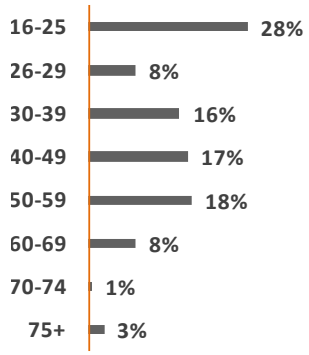
# Opposite Direction

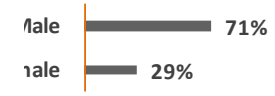
## US 195 opposite direction crash data:

| Failure to Obey Traffic Laws/Aggressive<br>*229 single, 60 two, and 7 three vehicle crashes* | Driver of 1st | 2nd | 3rd |
|---|---|---|---|
| Exceeding Reasonable Safe Speed | 23 | 1 | 0 |
| Improper Passing | 2 | 0 | 0 |
| Exceeding Stated Speed Limit | 1 | 0 | 1 |
| Did Not Grant Right-of-Way to Vehicle | 1 | 0 | 0 |
| Disregard Flagger - Officer | 1 | 0 | 0 |
| Follow Too Closely | 0 | 0 | 1 |
| **Distraction Type** | | | |
| Inattention | 1 | 0 | 0 |
| Driver Distractions Outside Vehicle | 1 | 0 | 0 |
| Other Driver Distractions Inside Vehicle | 1 | 1 | 0 |
| Unknown Driver Distraction | 1 | 0 | 0 |
| Driver Operating Other Electronic Device | 1 | 0 | 0 |
| **Impairment** | | | |
| Under Influence of Alcohol | 5 | 0 | 0 |
| Under Influence of Drugs | 2 | 0 | 0 |
| Had Been Drinking - Ability Not Impaired | 1 | 0 | 0 |
| **Drowsy/Illness** | | | |
| Apparently Ill | 2 | 0 | 0 |
| Apparently Asleep | 1 | 0 | 0 |

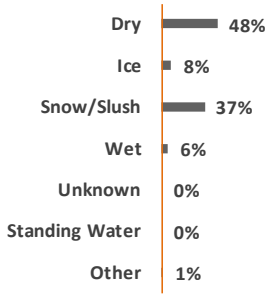
### Age



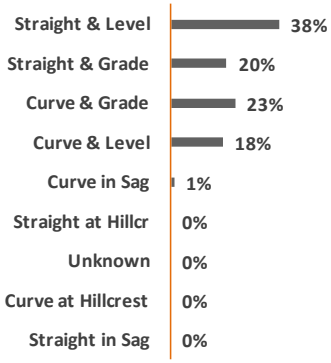

### Gender



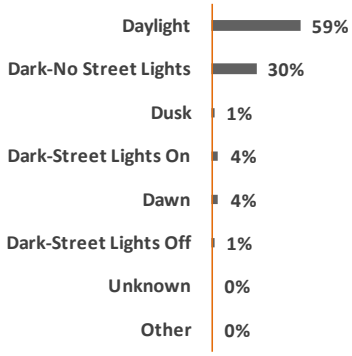

### Roadway Surface




### Roadway Character

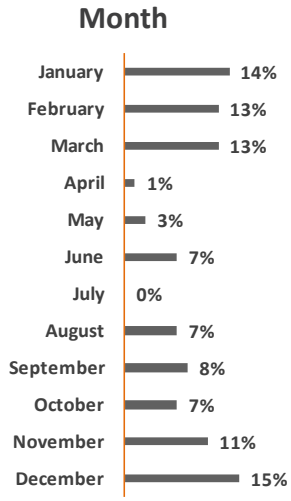


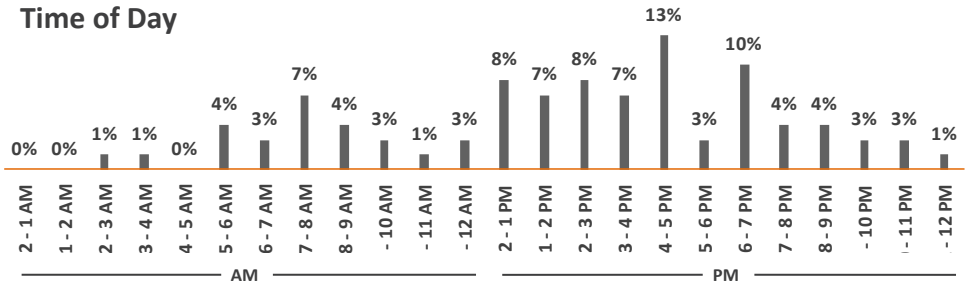

### Light Condition

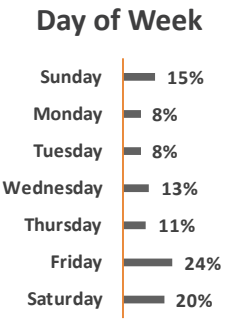


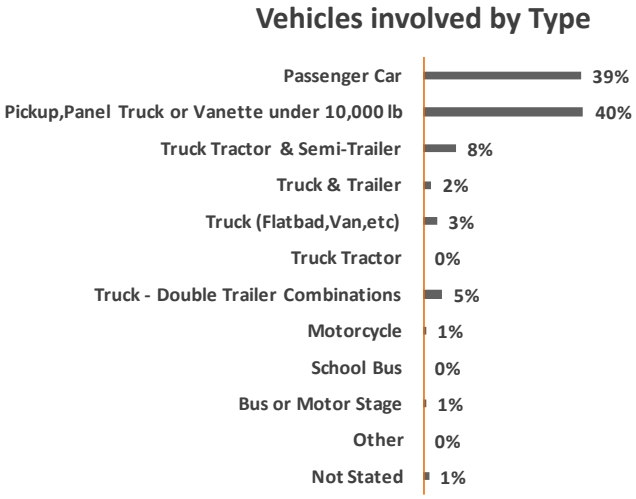
# Opposite Direction

## US 195 opposite direction crash data:



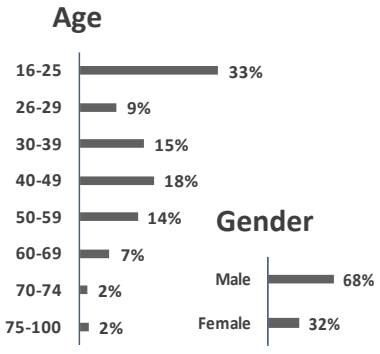




## US 195 opposite direction enforcement data:

Opposite direction crashes are not recorded as violations. No violation data is available.

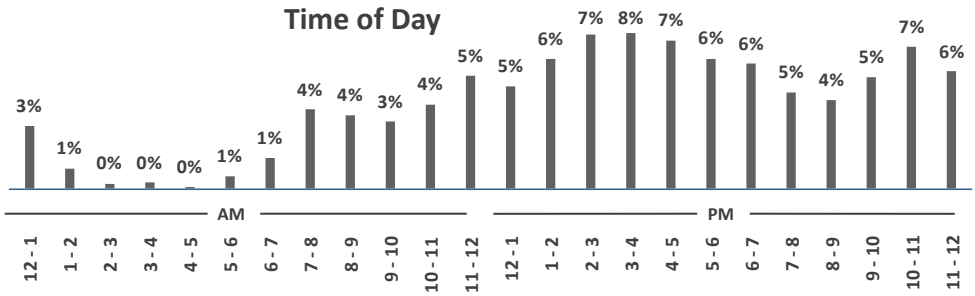
The following table and charts illustrate driver violations (excluding speeding) that increases the risk of an opposite direction crash. The violations include inappropriate passing, driving under the influence of alcohol/ drugs, erratic lane travel, reckless or negligent driving, and cell phone use.

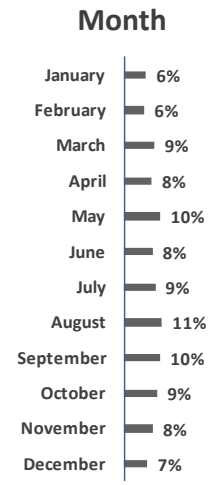
| Violation Name | Count |
|---|---|
| PASSING | 3037 |
| LANE TRAVEL | 1393 |
| CENTER LINE | 641 |
| ALCOHOL/DRUGS | 230 |
| RECKLESS/NEGLIGENT DRIVING | 123 |
| CELL PHONE -HANDHELD | 71 |

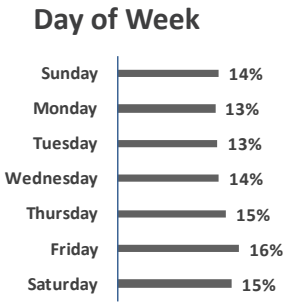


# Opposite Direction

## US 195 opposite direction enforcement data:




See Section “Community Engagement” for survey data

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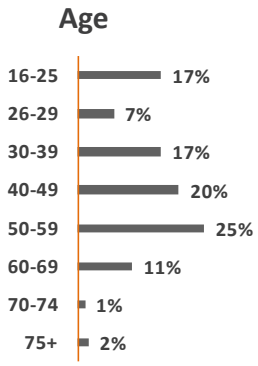
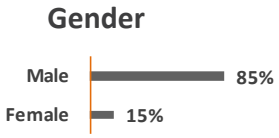
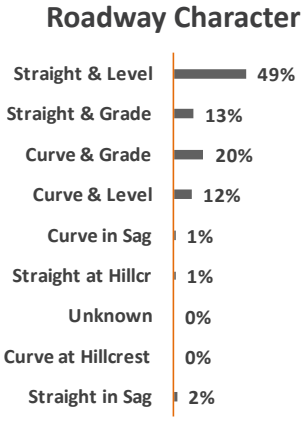
# Heavy Truck

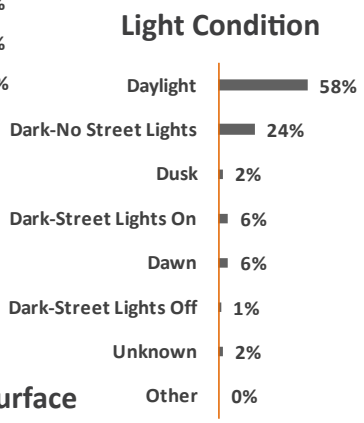
## US 195 heavy truk crash data:

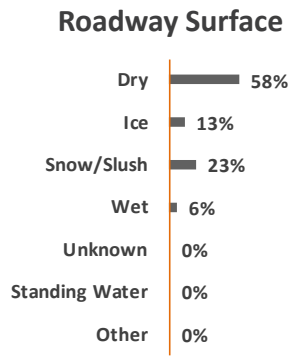
| Failure to Obey Traffic Laws/Aggressive | | |
|---|---|---|
| Exceeding Reasonable Safe Speed | 10 | 10 |
| Did Not Grant Right-of-Way to Vehicle | 6 | 5 |
| Follow Too Closely | 4 | 2 |
| Improper Passing | 0 | 2 |
| Improper U-Turn | 0 | 1 |
| Exceeding Stated Speed Limit | 0 | 1 |
| Disregard Flagger - Officer | 1 | 0 |
| **Distraction Type** | | |
| Inattention | 4 | 1 |
| Driver Distractions Outside Vehicle | 0 | 1 |
| Driver Interacting with Passengers, Animal | 1 | 0 |
| Other Driver Distractions Inside Vehicle | 1 | 0 |
| Unknown Driver Distraction | 0 | 1 |
| Driver Operating Other Electronic Device | 0 | 1 |
| Driver Reading or Writing | 1 | 0 |
| **Impairment** | | |
| Under Influence of Alcohol | 0 | 2 |
| Under Influence of Drugs | 0 | 2 |
| **Drowsy/Illness** | | |
| Apparently Asleep | 0 | 2 |
| Apparently Ill | 0 | 1 |
| **Misc** | | |
| Over Center Line | 6 | 19 |
| Operating Defective Equipment | 2 | 3 |
| Other | 9 | 2 |
| None | 44 | 18 |



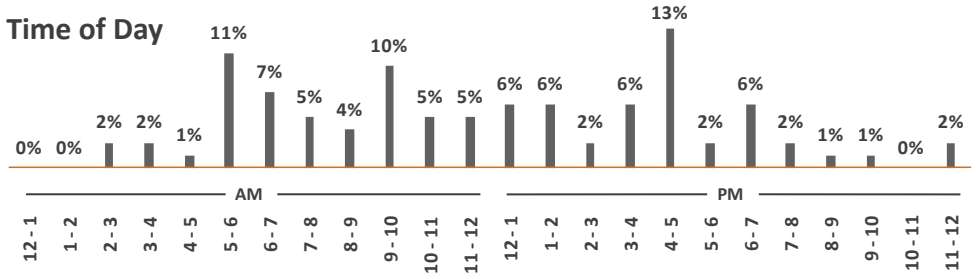



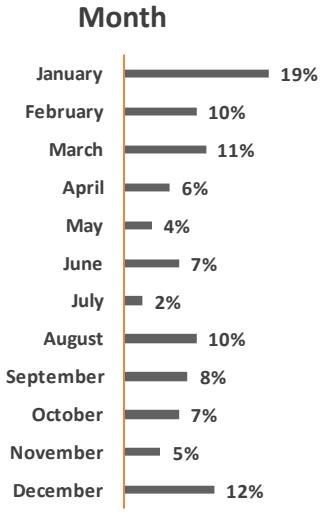



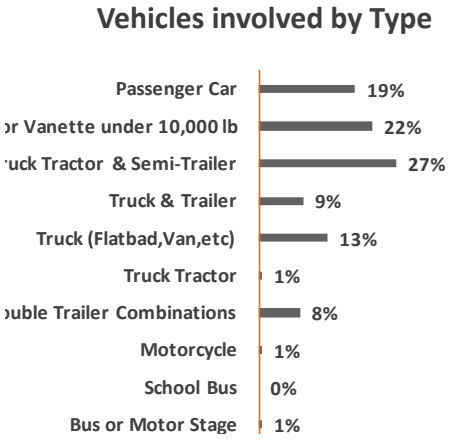



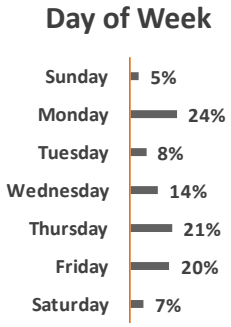
# Heavy Truck

## US 195 heavy truk crash data:



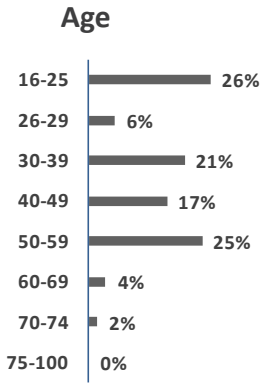



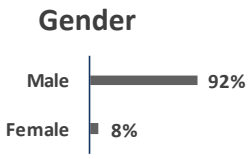




## US 195 heavy truck enforcement data:

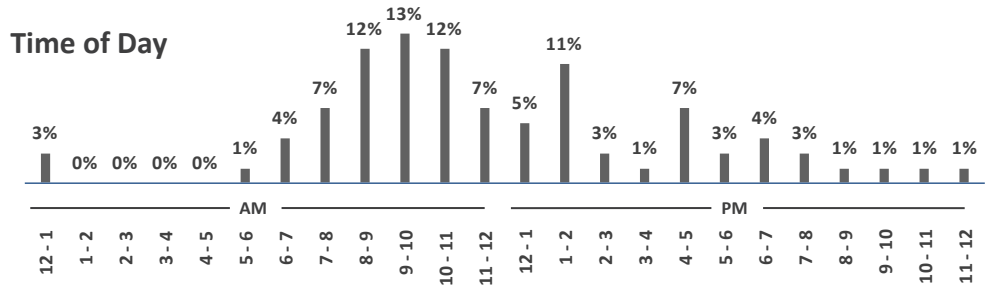
| Violation Name | Count |
|---|---|
| LOG BOOK-REG CARR | 43 |
| VALID TONNAGE | 7 |
| LOG BOOK-PRV CARR | 4 |
| COUPLING | 3 |
| OVER AXLE | 3 |
| FAIL CARRY CHNS | 2 |
| OVER TIRES | 2 |
| OVER LGL GROSS | 2 |
| OVER LIC CAPCTY | 2 |
| OVER WIDTH | 2 |
| TRIP PRMT-NONE | 2 |
| OVER HEIGHT | 1 |
| OVER AXLE SPCNG | 1 |
| OVER LENGTH | 1 |

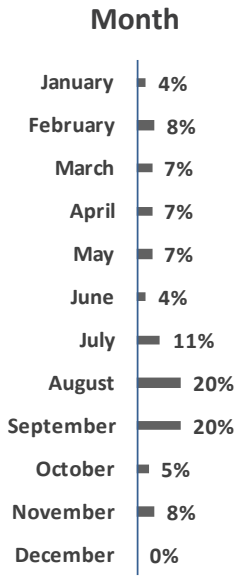


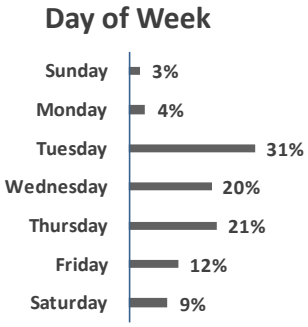



# Heavy Truck

## US 195 heavy truck enforcement data:




See Section “Community Engagement” for survey data

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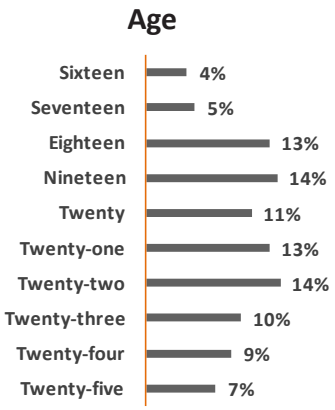
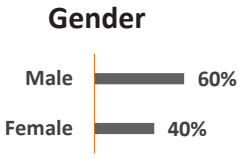
# Young Drivers

## US 195 young driver crash data:

| Failure to Obey Traffic Laws/Aggressive | Driver of 1st | 2nd | 3rd |
|---|---|---|---|
| Exceeding Reasonable Safe Speed | 128 | 0 | 0 |
| Did Not Grant Right-of-Way to Vehicle | 19 | 1 | 0 |
| Follow Too Closely | 14 | 2 | 2 |
| Improper Passing | 7 | 1 | 0 |
| Exceeding Stated Speed Limit | 7 | 0 | 0 |
| Improper Backing | 4 | 0 | 0 |
| Improper U-Turn | 2 | 0 | 0 |
| Fail to Yield Row to Pedestrian | 2 | 0 | 0 |
| Disregard Stop Sign - Flashing Red | 2 | 0 | 0 |
| **Distraction Type** | 1 | 0 | 0 |
| Inattention | 22 | 0 | 0 |
| Other Driver Distractions Inside Vehicle | 4 | 0 | 0 |
| Unknown Driver Distraction | 2 | 0 | 0 |
| Driver Distractions Outside Vehicle | 2 | 1 | 0 |
| Driver Interacting with Passengers, Animal | 2 | 0 | 0 |
| Driver Adjusting Audio or Entertainment | 1 | 0 | 0 |
| Driver Operating Other Electronic Device | 1 | 0 | 0 |
| **Impairment** | | | |
| Under Influence of Alcohol | 5 | 0 | 0 |
| Under Influence of Drugs | 1 | 0 | 0 |
| Had Been Drinking - Sobriety Unknown | 1 | 0 | 0 |
| Had Taken Medication | 1 | 0 | 0 |
| **Drowsy/Illness** | 1 | 0 | 0 |
| Apparently Asleep | 30 | 0 | 0 |
| Apparently Fatigued | 5 | 0 | 0 |

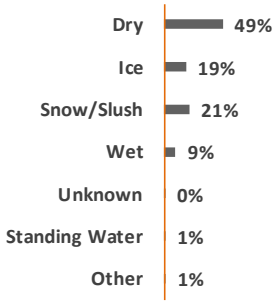


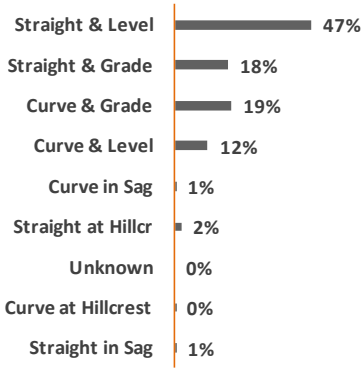
# Young Drivers

## US 195 young driver crash data:

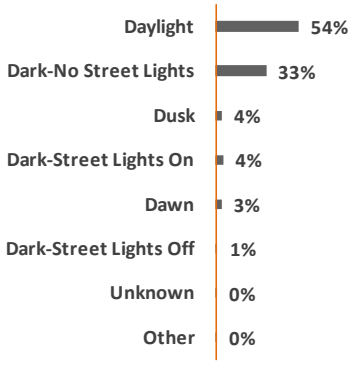
### Roadway Surface



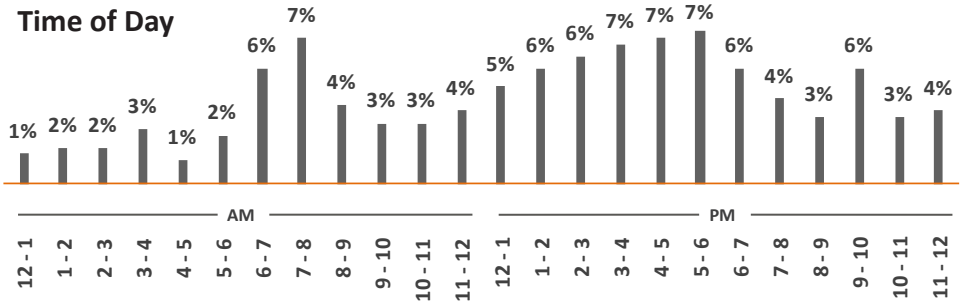

### Roadway Character



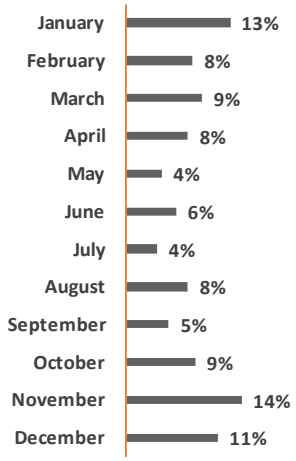

### Light Condition



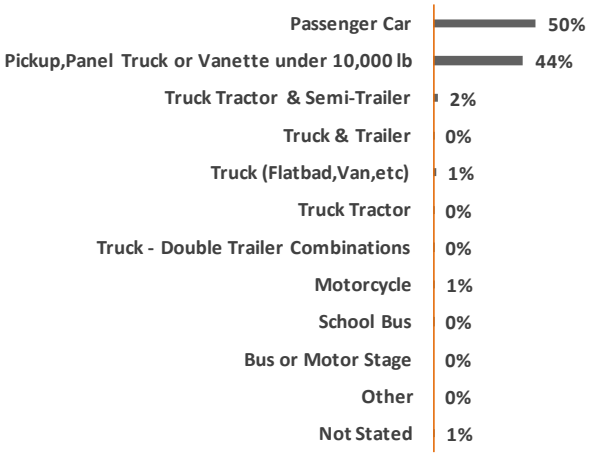

### Time of Day



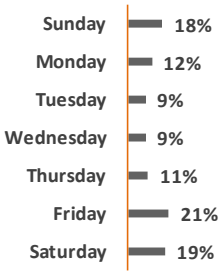

### Month




### Vehicles involved by Type




### Day of Week



# Young Drivers

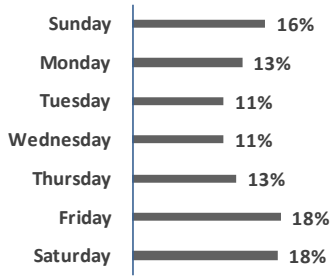
## US 195 young driver enforcement data:

### Young drivers share of violations compared to all other age groups

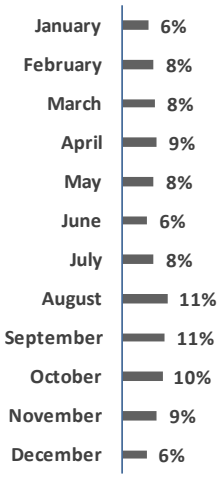
| Violation Type | |
|---|---|
| Speeding | 34% |
| Improper lane use | 34% |
| Unrestrained passengers | 32% |
| Other moving violation | 25% |
| Alcohol/Drug impaired | 32% |
| Distracted driving | 30% |
| Intersection related | 25% |
| Drivers license related | 42% |
| Vehicle tabs, Reg, Insurance | 41% |
| Defective equipment | 37% |

### Gender

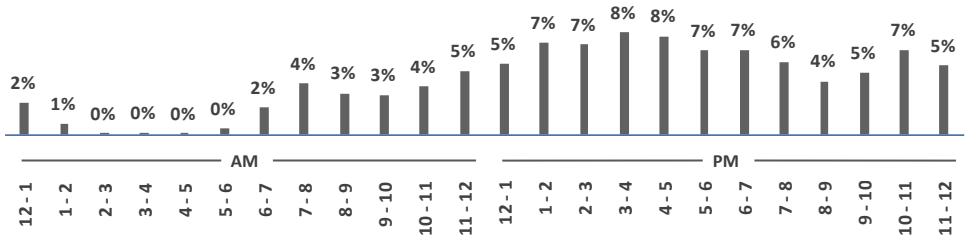

### Day of Week




### Month




### Time of Day




See Section “Community Engagement” for survey data

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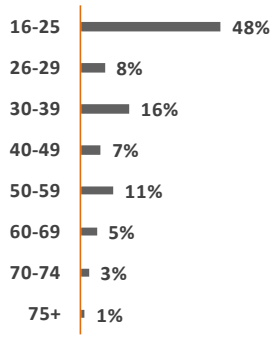
# Distracted

## US 195 distracted driver crash data:

| Failure to Obey Traffic Laws/Aggressive | Driver of 1st | 2nd | 3rd |
|---|---|---|---|
| Exceeding Reasonable Safe Speed | 16 | 0 | 0 |
| Follow Too Closely | 4 | 1 | 0 |
| Did Not Grant Right-of-Way to Vehicle | 4 | 0 | 0 |
| Improper Passing | 2 | 0 | 0 |
| Exceeding Stated Speed Limit | 1 | 0 | 0 |
| Disregard Stop Sign - Flashing Red | 1 | 0 | 0 |
| **Distraction Type** | | | |
| Inattention | 44 | 2 | 0 |
| Other Driver Distractions Inside Vehicle | 5 | 1 | 0 |
| Driver Distractions Outside Vehicle | 5 | 1 | 0 |
| Driver Interacting with Passengers, Animal | 4 | 0 | 0 |
| Unknown Driver Distraction | 4 | 1 | 0 |
| Driver Operating Handheld Telecommunication Device | 1 | 1 | 0 |
| Driver Adjusting Audio or Entertainment | 1 | 0 | 0 |
| Driver Operating Other Electronic Device | 1 | 0 | 0 |
| Driver Eating or Drinking | 1 | 0 | 0 |
| Driver Reading or Writing | 1 | 0 | 0 |
| **Impairment** | | | |
| None | 0 | 0 | 0 |
| **Drowsy/Illness** | | | |
| Apparently Fatigued | 1 | 0 | 0 |

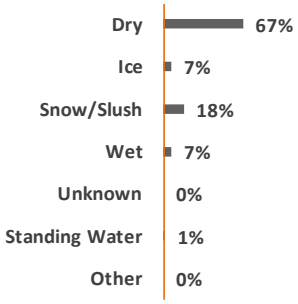
### Distracted drivers only

#### Age

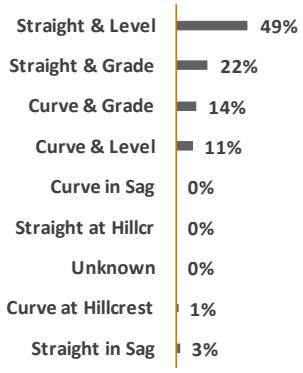



#### Gender

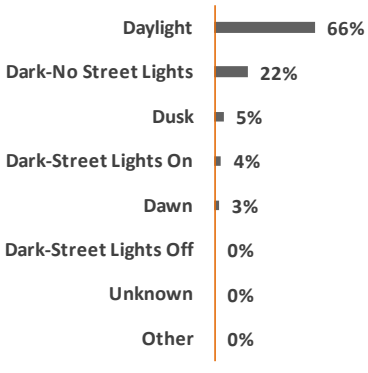

### Roadway Surface




### Roadway Character

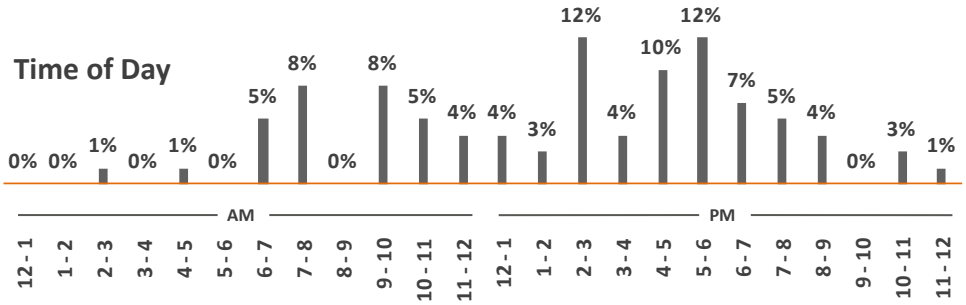


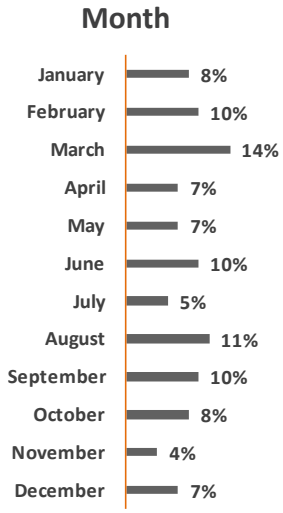

### Light Condition

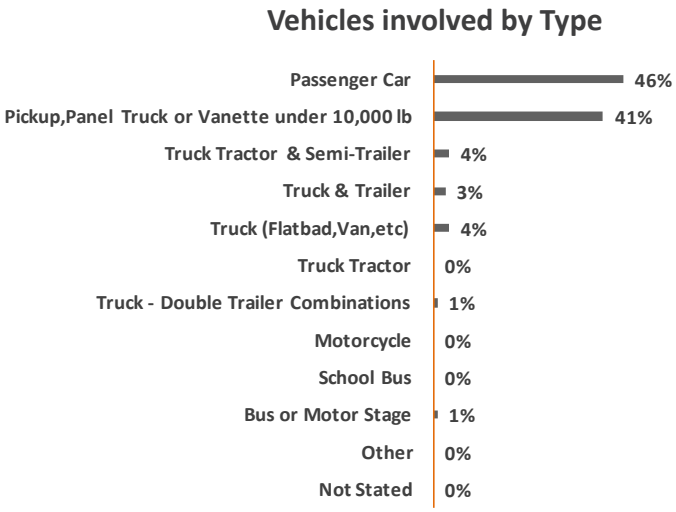


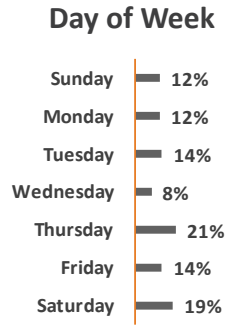
# Distracted

## US 195 distracted driver crash data:



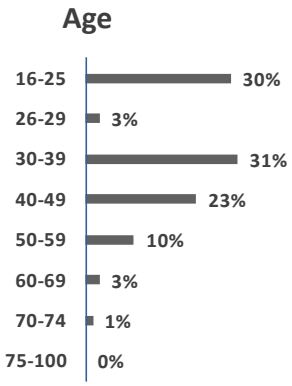



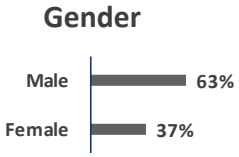




## US 195 distracted driver enforcement data:

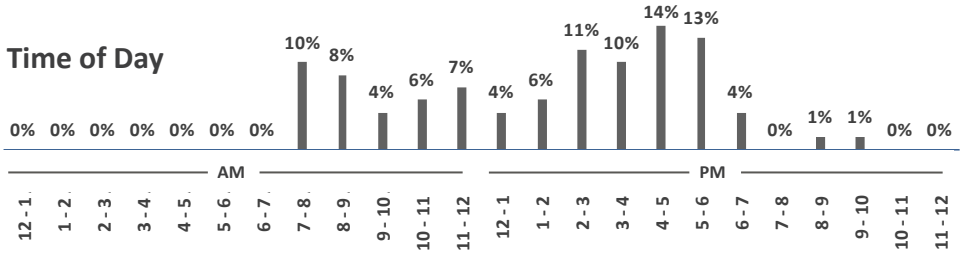
| Violation Name | Count |
|---|---|
| CELL PHONE -HANDHELD | 71 |

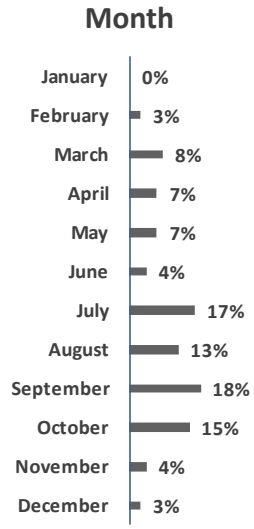


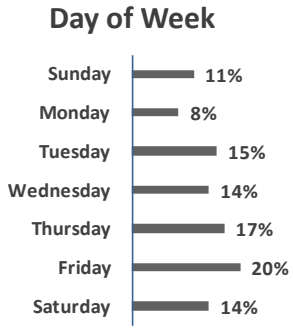



# Distracted

## US 195 distracted driver enforcement data:




**See Section "Community Engagement" for survey data**

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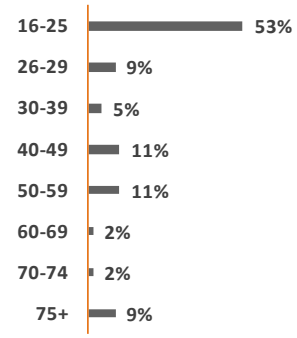
# Drowsy Drivers

## US 195 drowsy driver crash data:

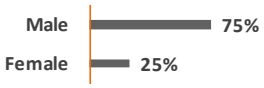
| Failure to Obey Traffic Laws/Aggressive | Driver of 1st | 2nd | 3rd |
|---|---|---|---|
| Exceeding Reasonable Safe Speed for Conditions | 4 | 0 | 0 |
| Exceeding Stated Speed Limit | 1 | 0 | 0 |
| **Distraction Type** | | | |
| Unknown Driver Distraction | 1 | 0 | 0 |
| **Impairment** | | | |
| Had Taken Medication | 2 | 0 | 0 |
| Under Influence of Alcohol | 1 | 0 | 0 |
| Had Been Drinking - Sobriety Unknown | 1 | 0 | 0 |
| **Drowsy/Illness** | | | |
| Apparently Asleep | 60 | 0 | 0 |
| Apparently Fatigued | 6 | 0 | 0 |

### Drowsy drivers only

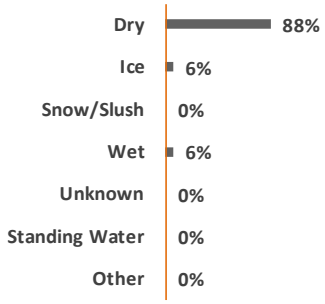
#### Age



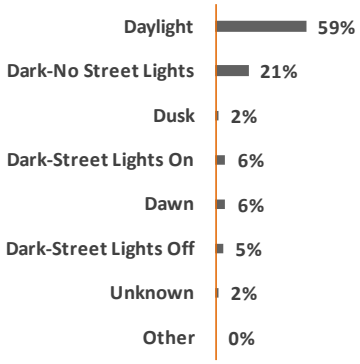

#### Gender



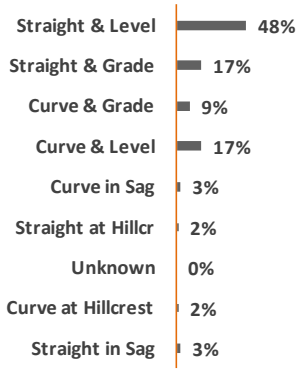

### Roadway Surface




### Light Condition

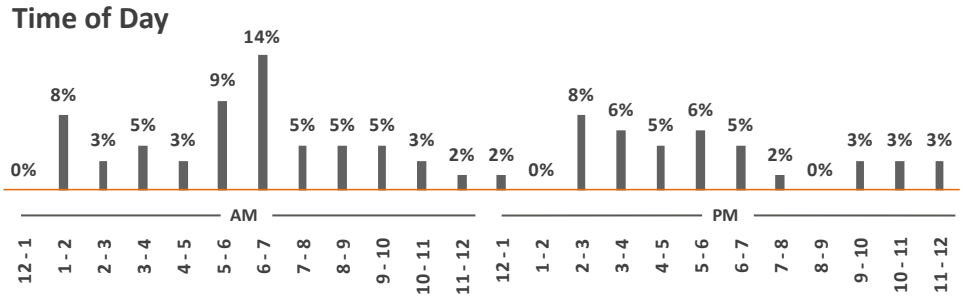


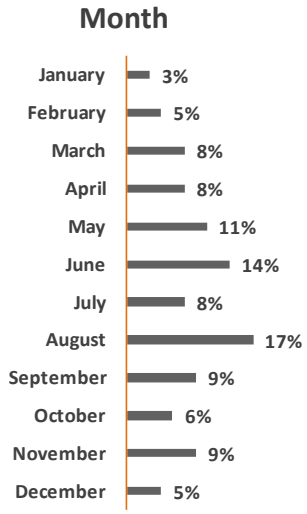

### Roadway Character

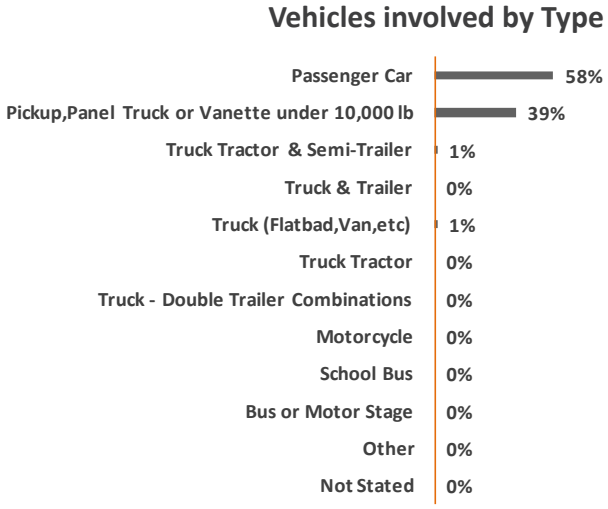


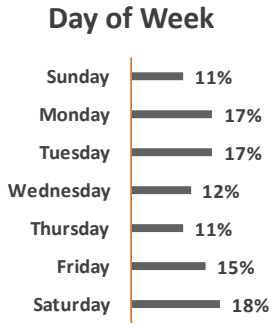
# Drowsy Drivers

## US 195 drowsy driver crash data:




## US 195 drowsy driver enforcement data:

Enforcement data is not available for drowsy driving. Drowsy driving is not a behavior that can be readily measured. While tests are available to determine if a driver is under the influence of alcohol, currently there are no tests to determine if a person is fatigued.

**See Section "Community Engagement" for survey data**

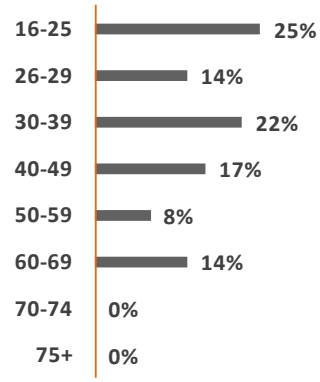
# Alcohol & Drugs

## US 195 alcohol and drug crash data:

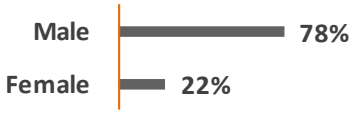
| Failure to Obey Traffic Laws/Aggressive | Driver of 1st | 2nd | 3rd |
|---|---|---|---|
| Exceeding Reasonable Safe Speed for Conditions | 9 | 0 | 0 |
| Exceeding Stated Speed Limit | 1 | 0 | 0 |
| Improper U-Turn | 1 | 0 | 0 |
| **Distraction Type** | | | |
| Driver Operating Handheld Telecommunication Device | 1 | 0 | 0 |
| **Sobriety** | | | |
| Under Influence of Alcohol | 23 | 0 | 0 |
| Under Influence of Drugs | 5 | 0 | 0 |
| Had Been Drinking - Sobriety Unknown | 4 | 0 | 0 |
| Had Been Drinking - Ability Not Impaired | 3 | 0 | 0 |
| Had Taken Medication | 2 | 0 | 0 |
| **Drowsy/Illness** | | | |
| Apparently Asleep | 4 | 0 | 0 |

**Only drivers with a contributing circumstance of alcohol/ drugs**

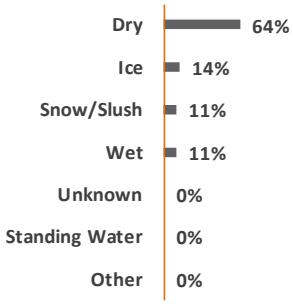
### Age



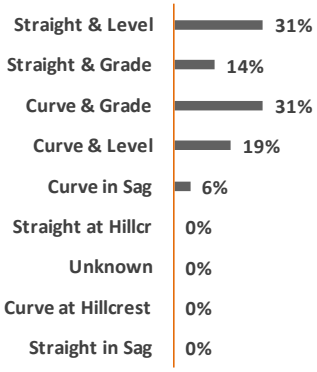

### Gender



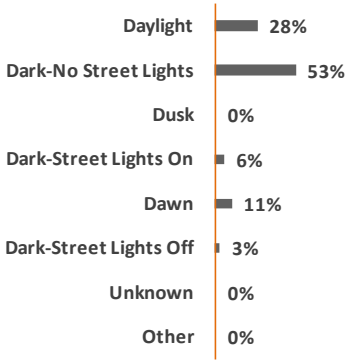

### Roadway Surface




### Roadway character



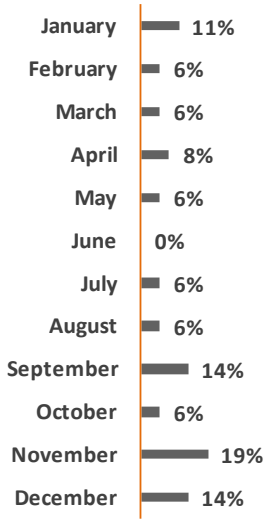

### Light Condition



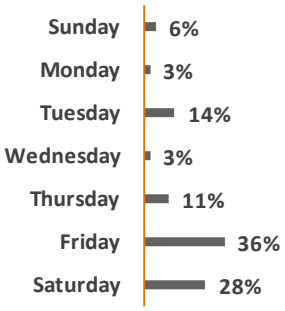
# Alcohol & Drugs

## US 195 alcohol and drug crash data:

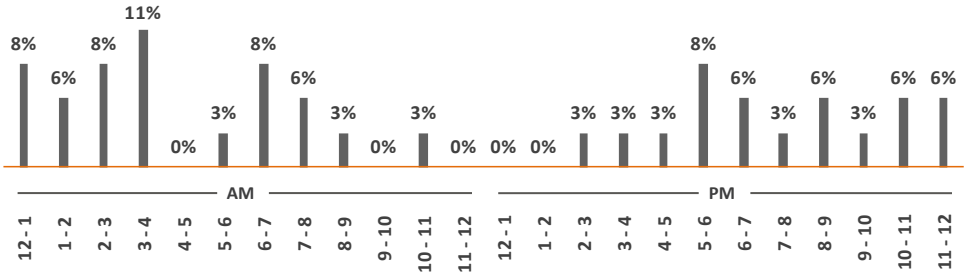
### Month



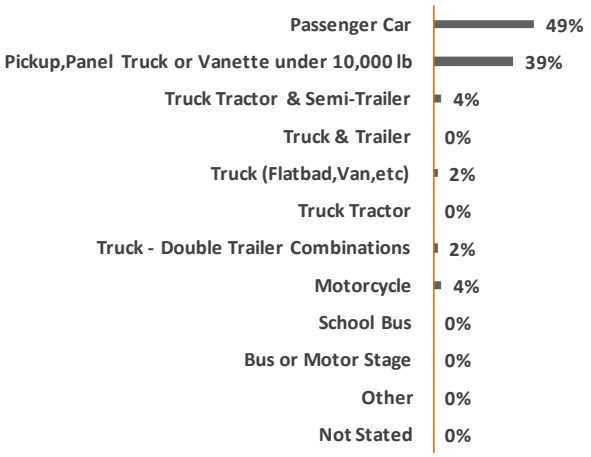

### Day of Week




### Time of Day

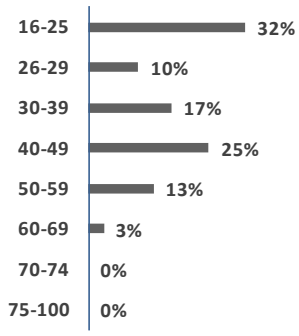



### Vehicles involved by type

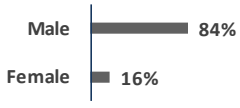



## US 195 alcohol and drug enforcement data:

### Age



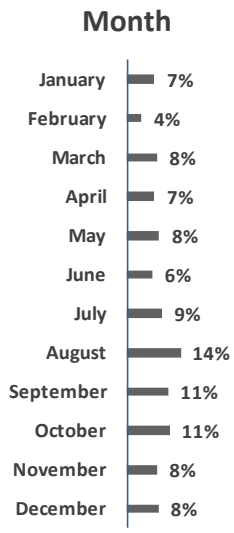

### Gender

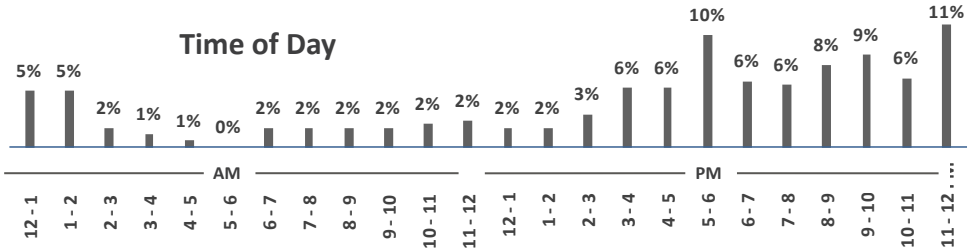


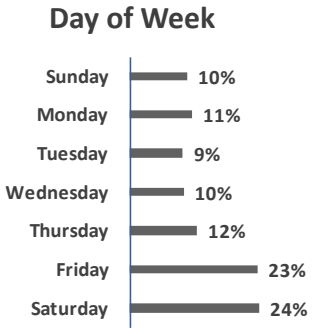

| Violation Name | Count |
|---|---|
| DUI--WITH TEST | 154 |
| DRUGS - MISDMNR | 50 |
| OPEN CONTAINER | 32 |
| DUI--W/O TEST | 31 |
| DUI-DRUG W/TEST | 25 |
| DRUGS - FELONY | 14 |
| MINOR POSSESSN | 9 |
| DUI-UNDR W/TEST | 7 |
| ALCOHOL W/OTEST | 3 |
| DUI-DRUG NOTEST | 1 |
| LIQUOR TO MINOR | 1 |

# Alcohol & Drugs

## US 195 alcohol and drug enforcement data:




## See Section "Community Engagement" for survey data

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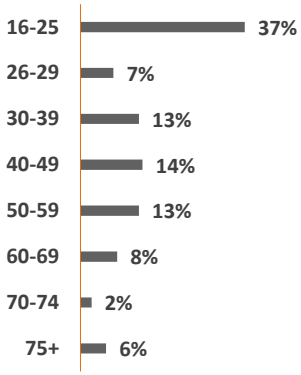
# Aggressive Drivers

**US 195 aggressive driver crash data:** Although no aggressive behavior data is available from the Crash Locations and Analysis System (CLAS) database, the following tables and charts show crashes involving a driver with two or more behaviors that would be defined as aggressive or a single behavior that requires a defensive action by another driver, as described by the National Highway Traffic Safety Administration.

| Failure to Obey Traffic Laws/Aggressive | *Driver of* 1st | 2nd | 3rd |
|---|---|---|---|
| Did Not Grant RW to Vehicle | 56 | 5 | 0 |
| Follow Too Closely | 33 | 0 | 1 |
| Exceeding Reas. Safe Speed | 18 | 2 | 1 |
| Improper Passing | 9 | 1 | 0 |
| Improper U-Turn | 3 | 0 | 0 |
| Disregard Stop Sign - Flashing Red | 3 | 0 | 0 |
| Fail to Yield Row to Pedestrian | 3 | 0 | 0 |
| Disreguard Flagger - Officer | 1 | 0 | 0 |
| Improper Turn | 1 | 0 | 0 |
| Disregard Stop and Go Light | 1 | 0 | 0 |
| **Distraction Type** | | | |
| Unknown Driver Distraction | 1 | 1 | 0 |
| Driver Distractions Outside Vehicle | 2 | 0 | 0 |
| Other Driver Distractions Inside Vehicle | 1 | 1 | 0 |
| Inattention | 1 | 0 | 0 |
| Driver Operating Handheld Telecommunicat | 1 | 0 | 0 |
| **Sobriety** | | | |
| HBD - Ability Not Impaired | 1 | 0 | 0 |

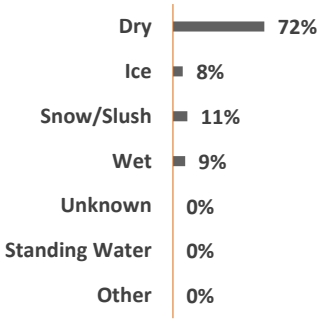
**Only drivers that had contributing circumstances meeting NHTSA aggressive behavior definitions**

### Age

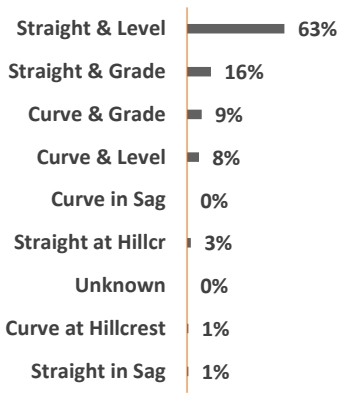



### Gender

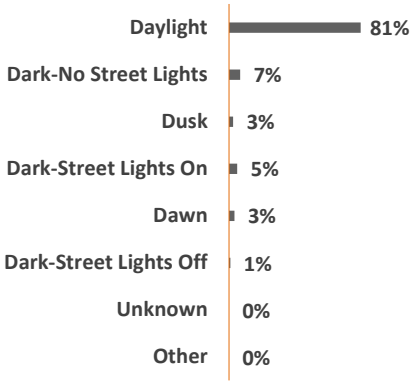

### Roadway Surface




### Roadway Character

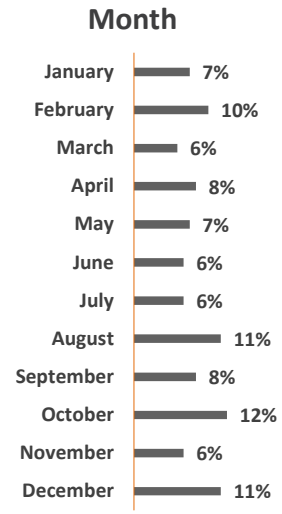


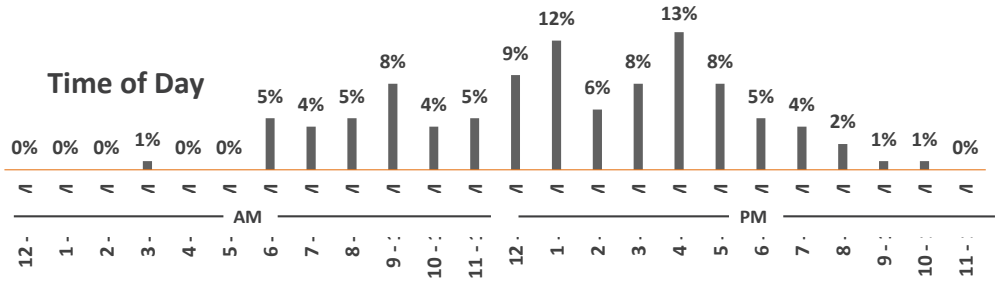

### Light Condition

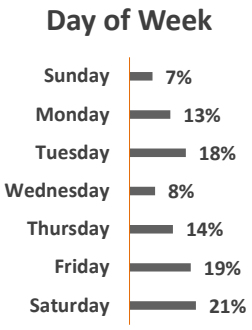


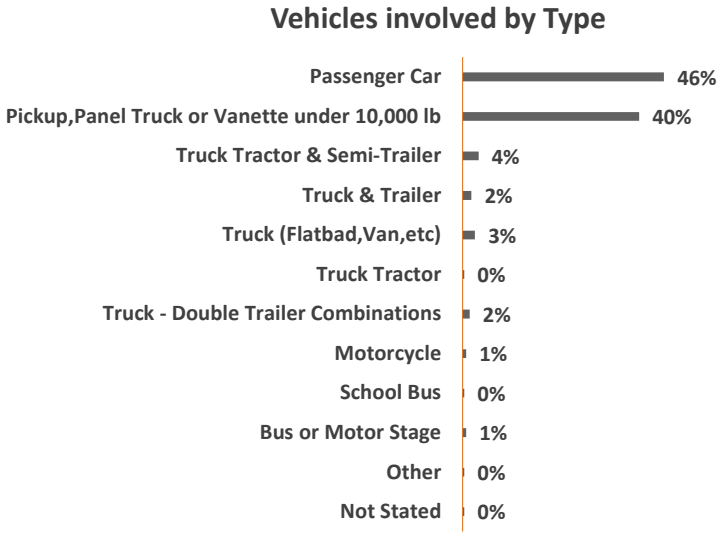
# Aggressive Drivers

## US 195 aggressive driver crash data:



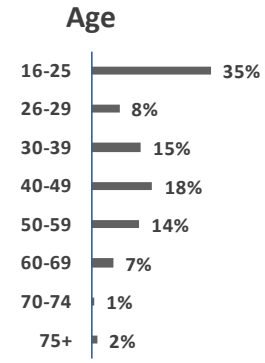



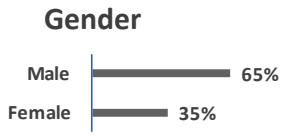



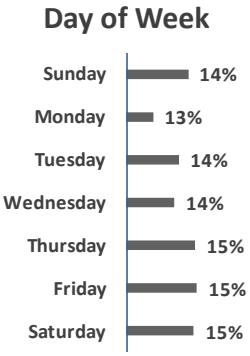
# Aggressive Drivers

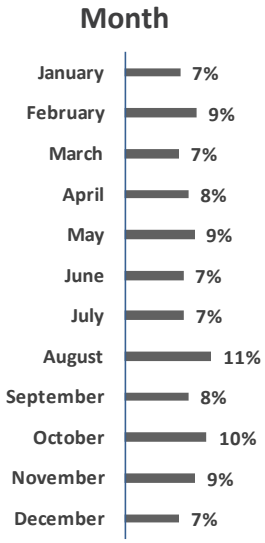
**US 195 aggressive driving enforcement data:** The following shows drivers with two or more violations that would be defined as aggressive driving or a single violation that requires a defensive action by another driver, as described by The National Highway Traffic Safety Administration.

| Violation Name | First | Second | Third |
|---|---|---|---|
| SPEED-RADAR | 1145 | 22 | 0 |
| CENTER LINE | 301 | 164 | 15 |
| LANE TRAVEL | 208 | 457 | 125 |
| FOLLOW CLOSE | 95 | 455 | 4 |
| SPEED-TOO FAST | 95 | 455 | 4 |
| STOP SIGN | 54 | 1 | 0 |
| NEG DRIVING 2ND | 49 | 5 | 8 |
| PASSING | 20 | 782 | 169 |
| RECKLESS DRIVING | 18 | 0 | 5 |
| SHOULDER | 13 | 242 | 186 |
| IMPEDING TRAFFIC | 13 | 1 | 0 |
| RIGHT OF WAY | 12 | 30 | 1 |
| NEG DRIVING 1ST | 9 | 0 | 0 |
| SPEED | 9 | 0 | 0 |
| CELL PHONE -HANDHELD | 0 | 33 | 3 |
| LANE CHANGE | 0 | 15 | 10 |
| SIGNAL | 0 | 15 | 0 |
| SPEED-AIRCRAFT | 2 | 62 | 34 |
| TRAFFIC LIGHT | 76 | 0 | 0 |
| TURNING | 0 | 1 | 1 |





**See Section "Community Engagement" for survey data**

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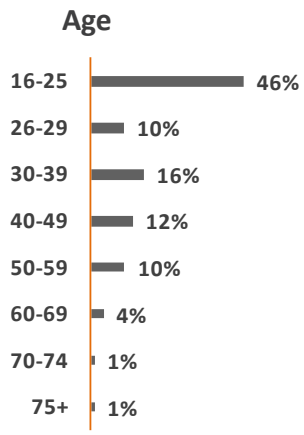
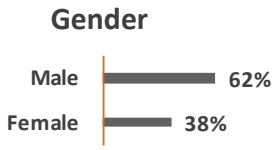
# Speeding

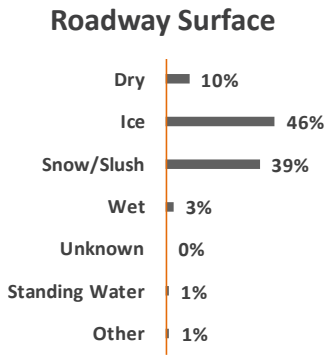
## US 195 speeding driver crash data:

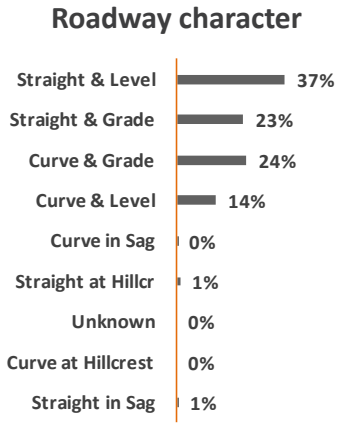
| Failure to Obey Traffic Laws/Aggressive<br>*229 single, 60 two, and 7 three vehicle crashes* | Driver of 1st | 2nd | 3rd |
|---|---|---|---|
| Exceeding Reasonable Safe Speed | 283 | 5 | 1 |
| Exceeding Stated Speed Limit | 10 | 0 | 0 |
| Follow Too Closely | 7 | 1 | 2 |
| Improper Passing | 5 | 0 | 0 |
| Did Not Grant Right-of-Way to Vehicle | 1 | 0 | 0 |
| **Distraction Type** | | | |
| Inattention | 11 | 0 | 0 |
| Driver Interacting with Passengers, Animal | 2 | 0 | 0 |
| Unknown Driver Distraction | 2 | 0 | 0 |
| Driver Operating Handheld Telecommunication Device | 1 | 0 | 0 |
| **Impairment** | | | |
| Under Influence of Alcohol | 3 | 0 | 0 |
| Under Influence of Drugs | 1 | 0 | 0 |
| **Drowsy/Illness** | | | |
| Apparently Asleep | 3 | 0 | 0 |
| Apparently Fatigued | 2 | 0 | 0 |

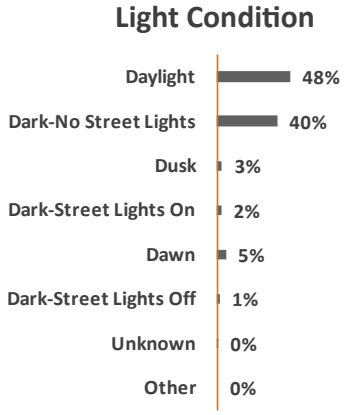
### Speeding drivers only



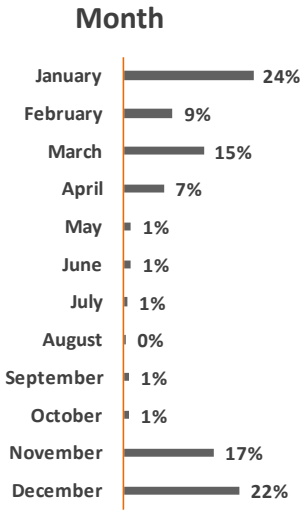



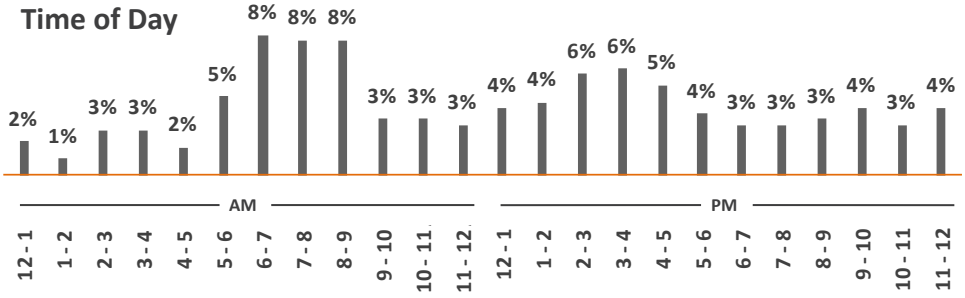



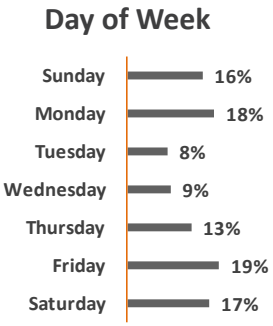



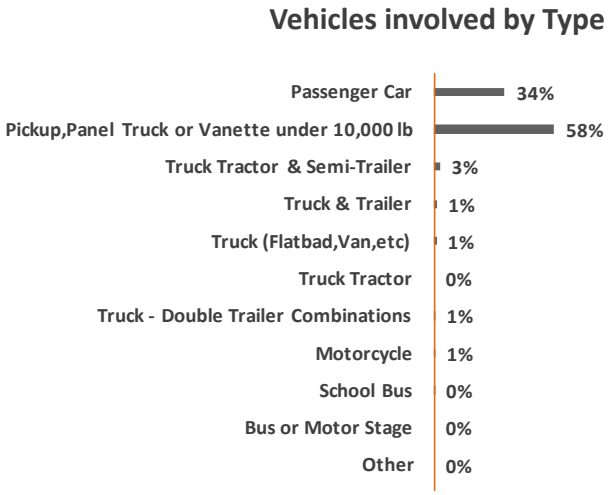
# Speeding

## US 195 speeding driver crash data:



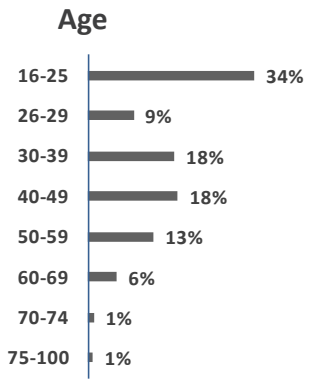



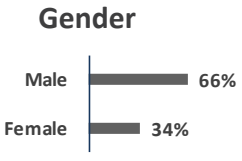




## US 195 speeding driver enforcement data:

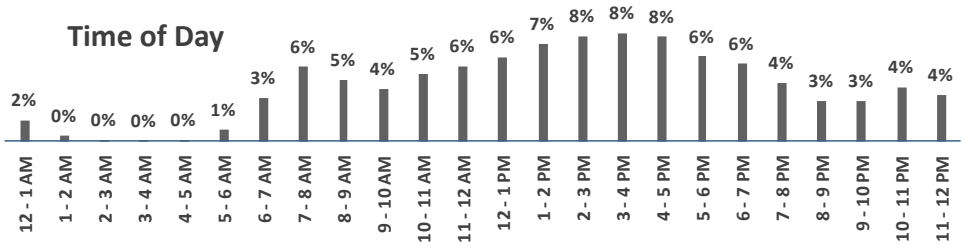
| Violation Name | Count |
|---|---|
| SPEED-RADAR | 24,373 |
| SPEED-AIRCRAFT | 727 |
| SPEED | 634 |
| SPEED-TOO FAST | 527 |

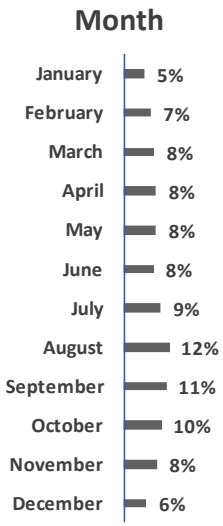


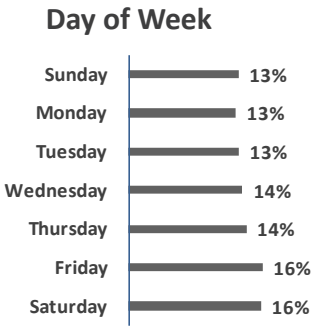



# Speeding

## US 195 speeding driver enforcement data:




**See Section "Community Engagement" for survey data**

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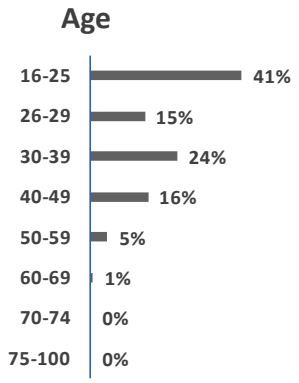
# Unlicensed

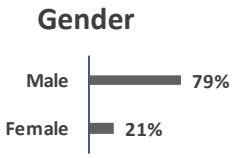
## US 195 unlicesned driver crash data: Not available

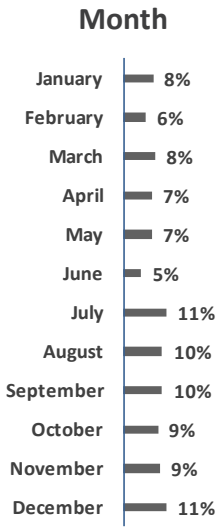
"Unlike the factors presented in the other chapters of Target Zero, license status data is not captured in WSDOT's crash database. Driver identification numbers are captured, but 21% of those numbers for serious injury crashes from 2003 through 2008 could not be matched to DOL's driver identification numbers, and only suspended and revoked data could be matched to serious injury crashes. Because the serious injury data is not complete, it will not be presented ..." **Washington State's Strategic Highway Safety Plan 2010: Target Zero**

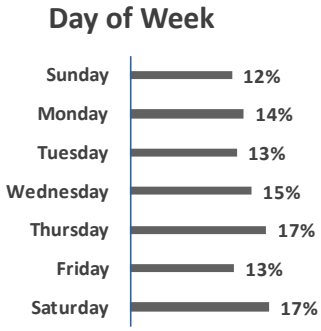
## US 195 unlicensed driver enforcement data:

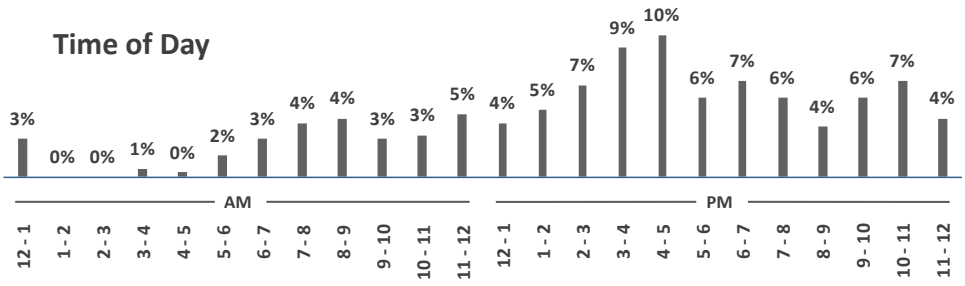
| Violation Name | Count |
|---|---|
| LC SUSP/REV 3RD | 218 |
| LC SUSP/REV 1ST | 47 |
| OPER LIC - C | 43 |
| LC SUSP/REV 2ND | 24 |




## See Section "Community Engagement" for survey data

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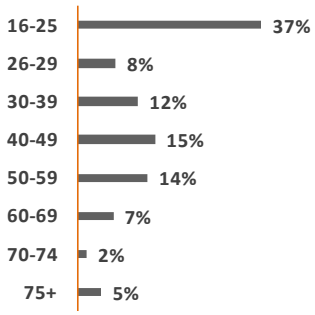
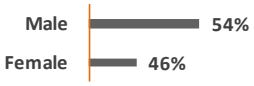
## US 195 Intersection crash data:

| Failure to Obey Traffic Laws/Aggressive | Driver of 1st | 2nd | 3rd |
|---|---|---|---|
| Did Not Grant Right-of-Way to Vehicle | 40 | 4 | 0 |
| Follow Too Closely | 17 | 5 | 2 |
| Exceeding Reasonable Safe Speed | 15 | 0 | 1 |
| Improper Backing | 4 | 0 | 0 |
| Disregard Stop Sign - Flashing Red | 3 | 0 | 0 |
| Improper U-Turn | 3 | 0 | 0 |
| Fail to Yield Row to Pedestrian | 3 | 0 | 0 |
| Improper Turn | 3 | 0 | 0 |
| Exceeding Stated Speed Limit | 1 | 0 | 0 |
| Disregard Stop and Go Light | 1 | 0 | 0 |
| **Distraction Type** | | | |
| Driver Distractions Outside Vehicle | 2 | 1 | 0 |
| Driver Interacting with Passengers, Animal | 2 | 0 | 0 |
| Other Driver Distractions Inside Vehicle | 0 | 0 | 0 |
| Unknown Driver Distraction | 0 | 1 | 0 |
| **Impairment** | | | |
| None recorded | 0 | 0 | 0 |
| **Drowsy/Illness** | | | |
| None recorded | 0 | 0 | 0 |

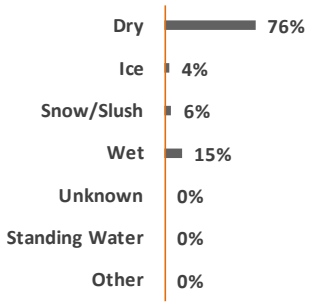
### Age



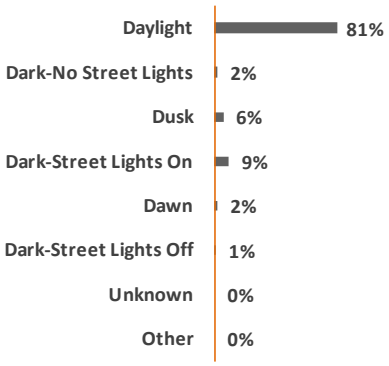

### Gender



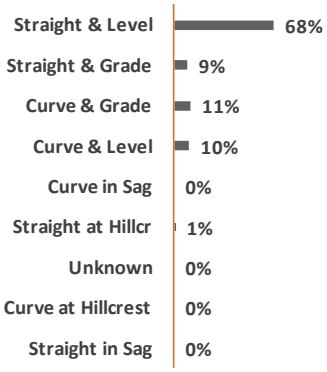

### Roadway Surface




### Light Condition



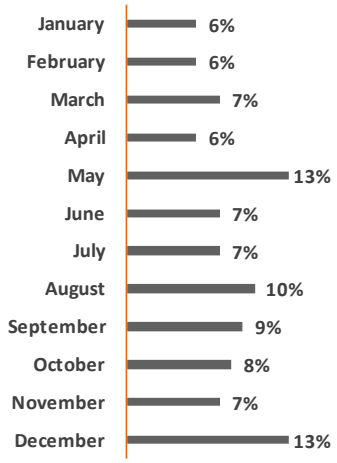

### Roadway Character



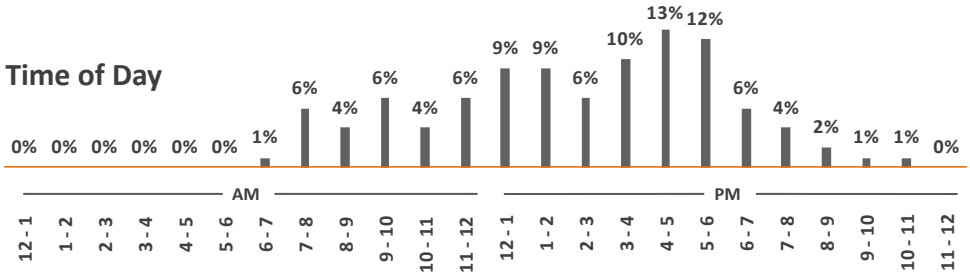
# Intersections

## US 195 Intersection crash data:

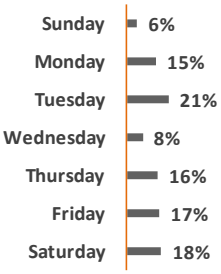
### Month



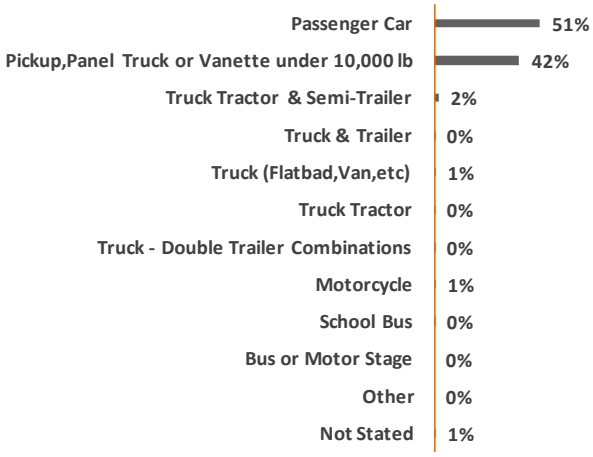

### Time of Day




### Day of Week



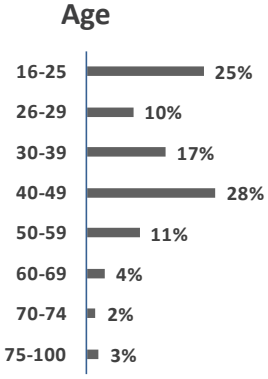

### Vehicles involved by Type



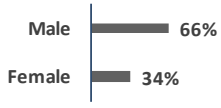

## US 195 Intersection enforcement data:

| Violation Name | Count |
|---|---|
| STOP SIGN | 150 |
| TRAFFIC LIGHT | 9 |

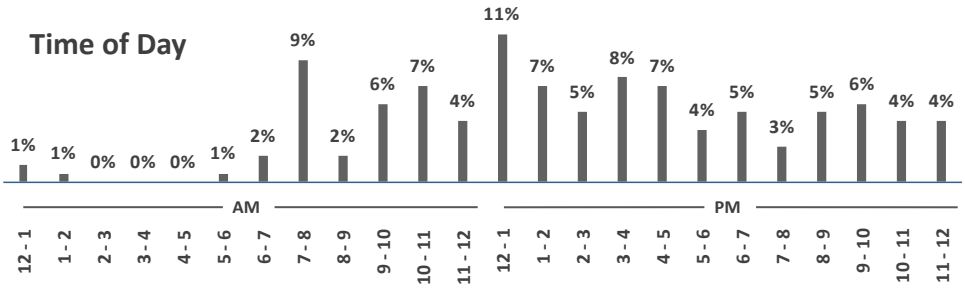
### Age

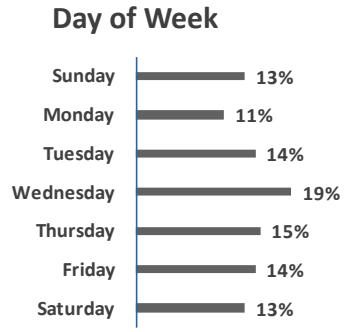



### Gender



## US 195 Intersection enforcement data:




**See Section "Community Engagement" for survey data**

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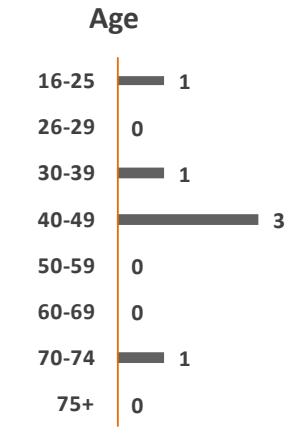
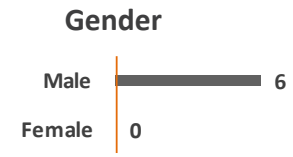
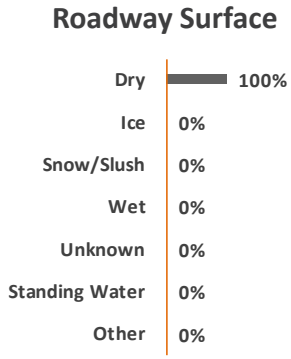
# Unrestrained

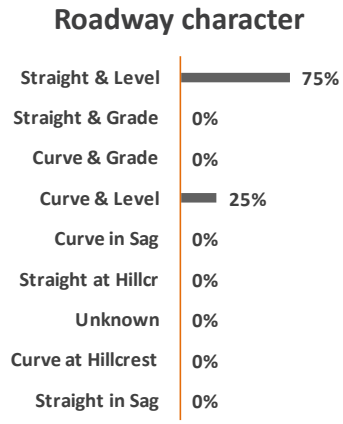
## US 195 unrestrained occupant crash data:

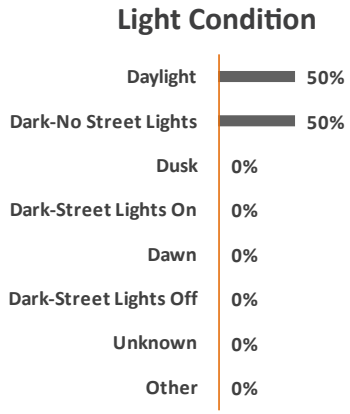
| Failure to Obey Traffic Laws/Aggressive | Driver of 1st | 2nd | 3rd |
|---|---|---|---|
| Did Not Grant Right-of-Way to Vehicle | 1 | 0 | 0 |
| **Distraction Type** | | | |
| None Recorded | 0 | 0 | 0 |
| **Impairment** | | | |
| None Recorded | 0 | 0 | 0 |
| **Drowsy/Illness** | | | |
| None Recorded | 0 | 0 | 0 |

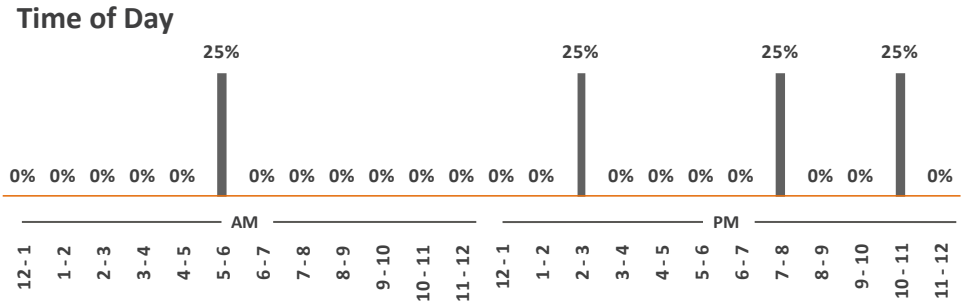


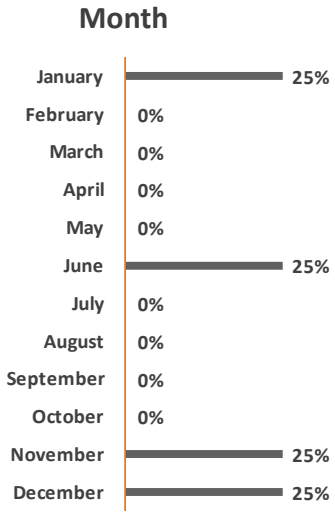



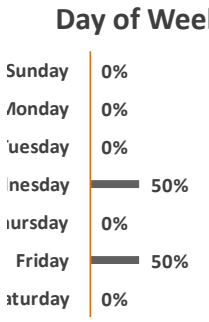



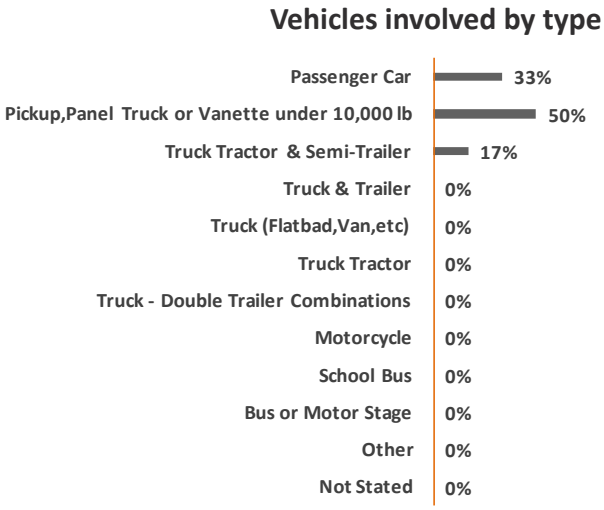



# Unrestrained

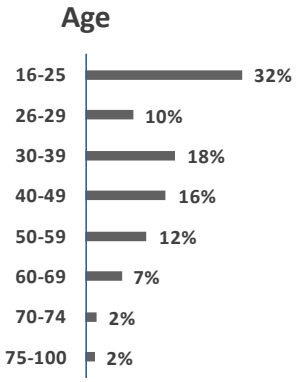


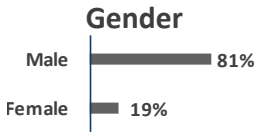




## US 195 unrestrained occupant enforcement data:

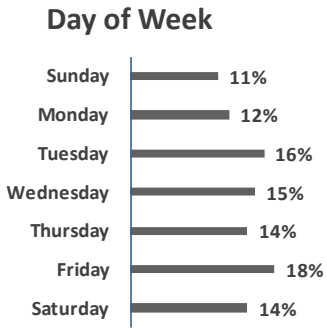
| Violation Name | Count |
|---|---|
| SAFETY BELTS | 650 |
| CHILD RESTRAINT | 17 |

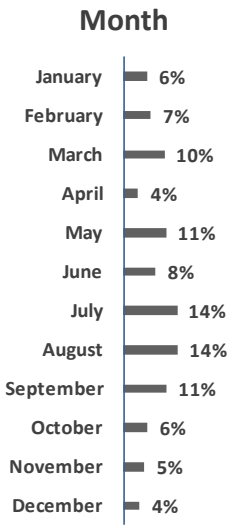


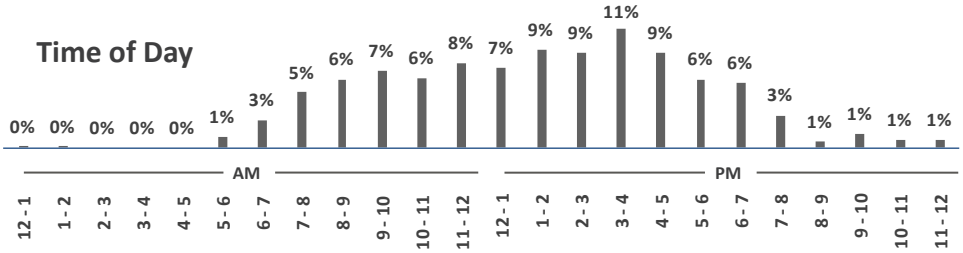



# Unrestrained

## US 195 unrestrained occupant enforcement data:




**See Section "Community Engagement" for survey data**

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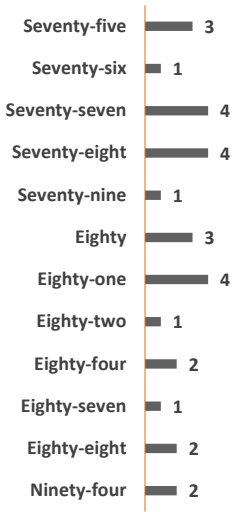
# Older Drivers

## US 195 older driver crash data:

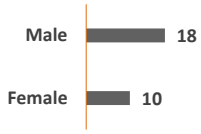
| Failure to Obey Traffic Laws/Aggressive | Driver of 1st | 2nd | 3rd |
|---|---|---|---|
| Did Not Grant Right-of-Way to Vehicle | 6 | 4 | 0 |
| Exceeding Reasonable Safe Speed | 3 | 0 | 0 |
| Fail to Yield Row to Pedestrian | 0 | 0 | 0 |
| Exceeding Stated Speed Limit | 0 | 0 | 0 |
| Follow Too Closely | 0 | 1 | 1 |
| **Distraction Type** | | | |
| Driver Distractions Outside Vehicle | 1 | 0 | 0 |
| Unknown Driver Distraction | 0 | 1 | 0 |
| **Impairment** | | | |
| None Recorded | 0 | 0 | 0 |
| **Drowsy/Illness** | | | |
| Apparently Asleep | 6 | 0 | 0 |
| Apparently Fatigued | 1 | 0 | 0 |

### Older drivers only

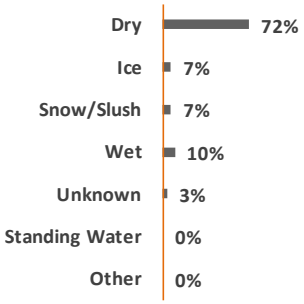
#### Age



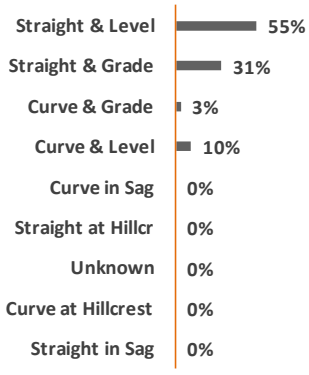

#### Gender



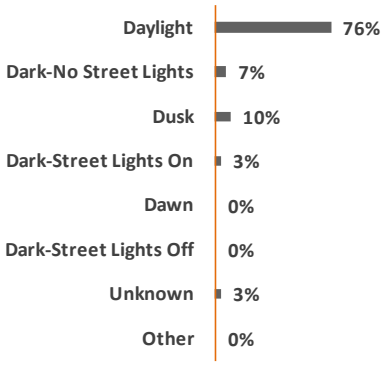

### Roadway Surface




### Roadway Character




### Light Condition



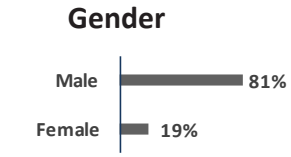
# Older Drivers

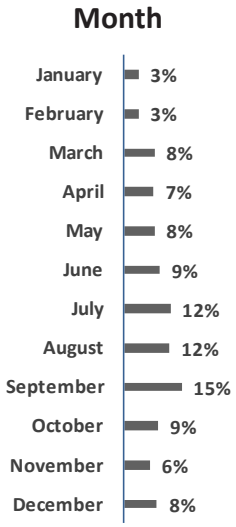
## US 195 older driver enforcement data:

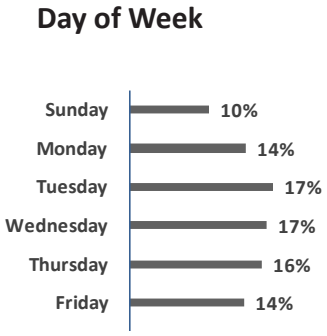
- Older drivers account for 1% of all violations compared to all other age groups

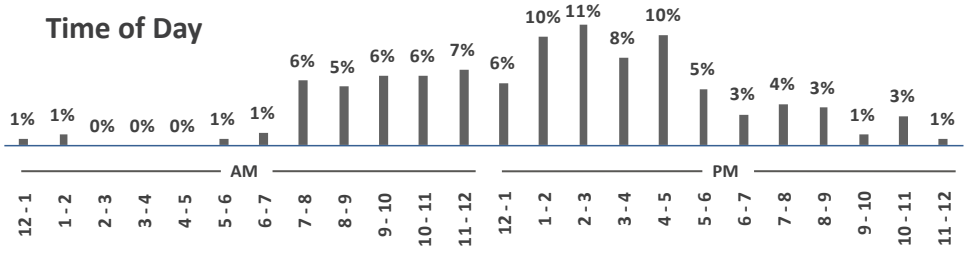
| Violation Name | Count |
|---|---|
| SPEED-RADAR | 246 |
| PASSING | 49 |
| LANE TRAVEL | 48 |
| LIGHT VIOLATION | 21 |
| SHOULDER | 21 |
| CENTER LINE | 17 |
| VEH LIC TABS | 15 |
| SAFETY BELTS | 12 |
| OTHR VIOL - I | 11 |
| INSURANCE, NONE | 10 |
| IMPEDING TRAFFIC | 9 |
| FOLLOW CLOSE | 8 |
| SIGNAL | 8 |
| SPEED | 8 |

| Violation Name | Count |
|---|---|
| SPEED | 8 |
| VEH REGIST PAPR | 6 |
| RIGHT OF WAY | 5 |
| STOP SIGN | 4 |
| OPER LIC - I | 3 |
| SPEED-TOO FAST | 3 |
| OTHR DEF EQUIP | 2 |
| HEADLIGHTS-DIM | 2 |
| TIRES | 2 |
| TURNING | 2 |
| HEADLIGHTS-NONE | 1 |
| SPEED-AIRCRAFT | 1 |
| DEBRIS ESCAPE | 1 |



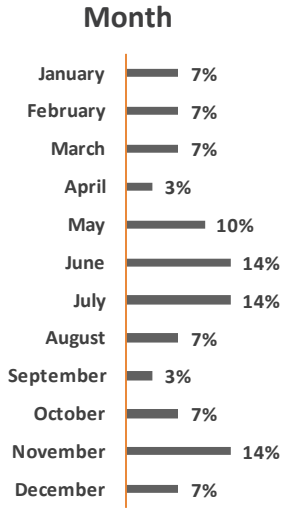



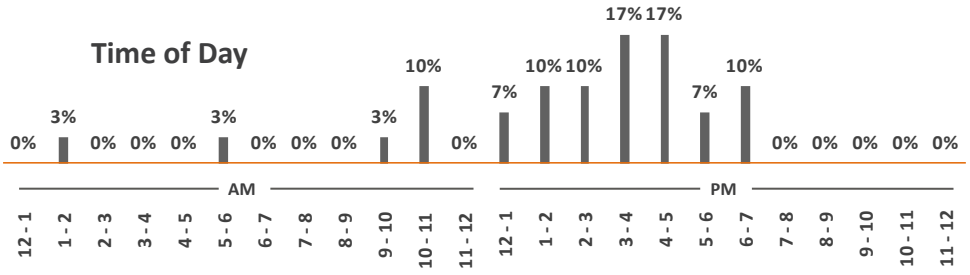



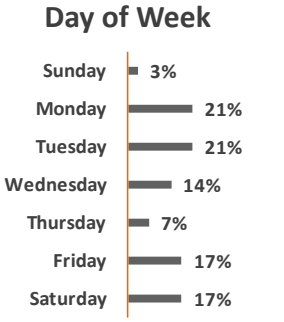

**See Section "Community Engagement" for survey data**

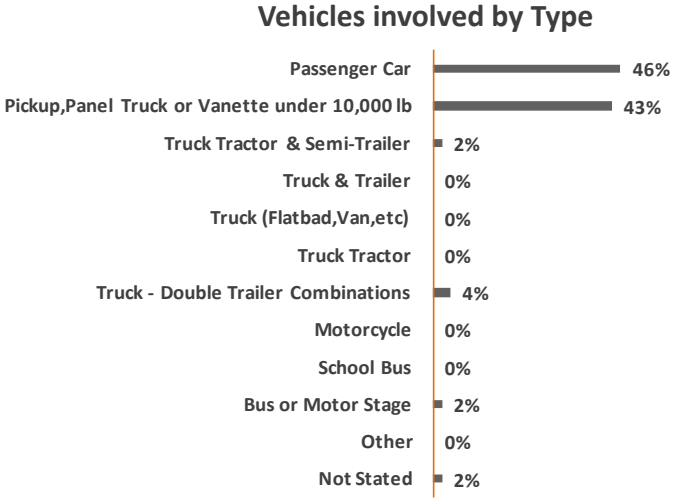
# Older Drivers

## US 195 older driver crash data:



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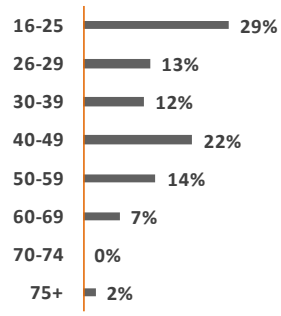
# Wildlife

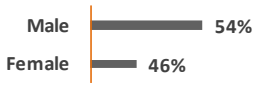
## US 195 wildlife crash data:

| Failure to Obey Traffic Laws/Aggressive | Driver of 1st | 2nd | 3rd |
|---|---|---|---|
| None Recorded | 0 | 0 | 0 |
| **Distraction Type** | | | |
| None Recorded | 0 | 0 | 0 |
| **Sobriety** | | | |
| None Recorded | 0 | 0 | 0 |
| **Drowsy/Illness** | | | |
| None Recorded | 0 | 0 | 0 |

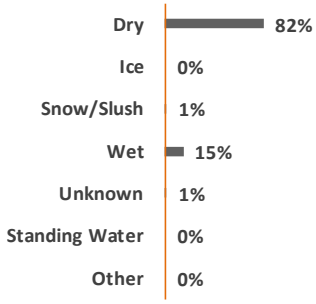
### Age



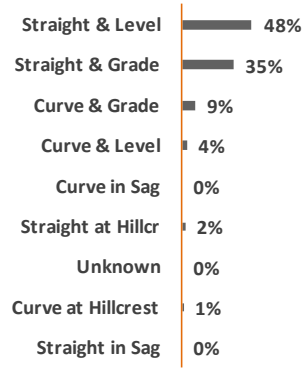

### Gender



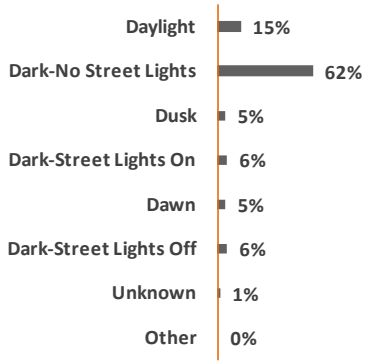

### Roadway Surface




### Roadway Character

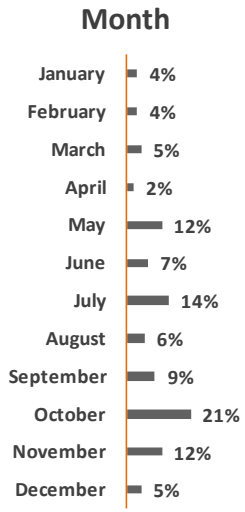


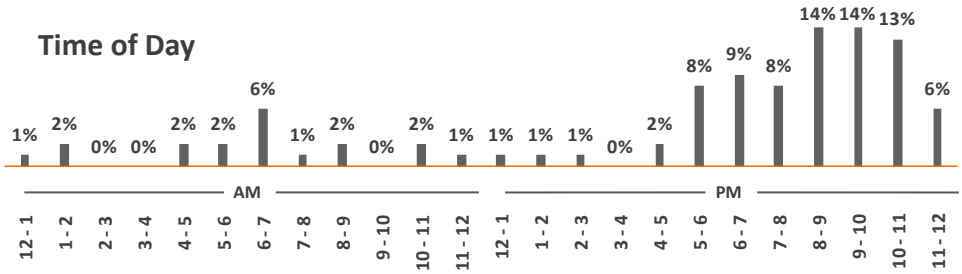

### Light Condition

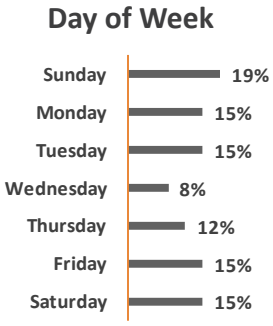


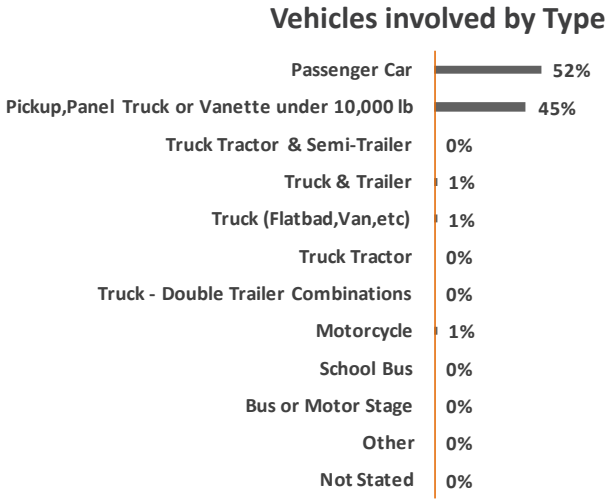
# Wildlife

## US 195 wildlife crash data:



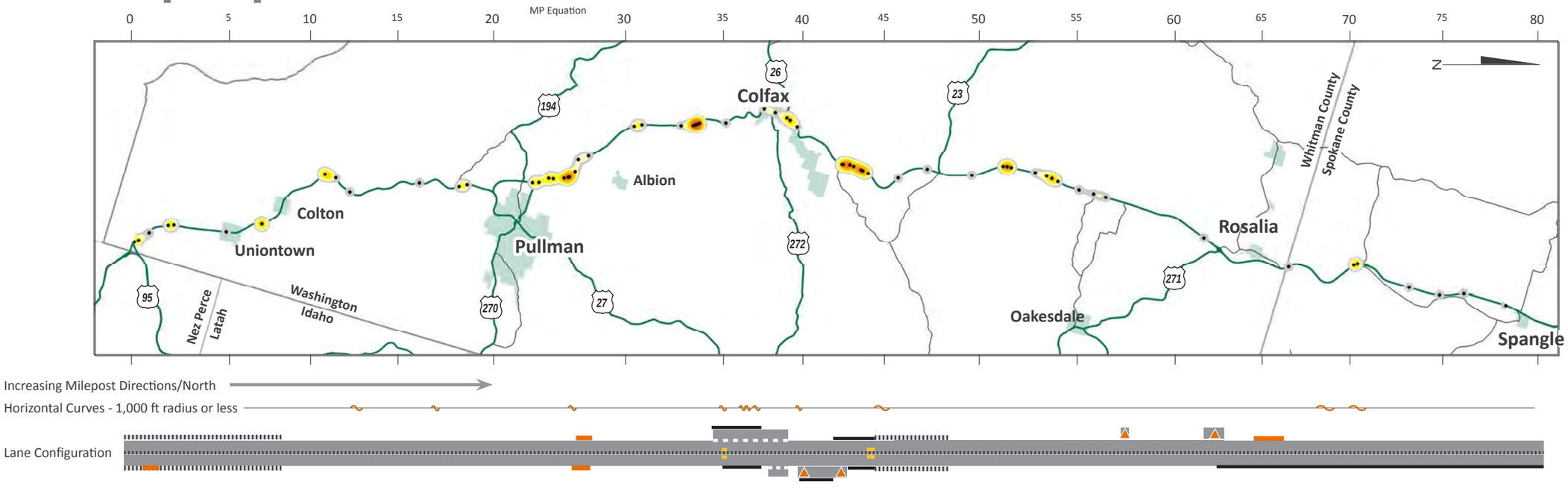




## US 195 wildlife enforcement data:

Wildlife crashes are not recorded as violations. No violation data is available.

## See Section "Community Engagement" for survey data

# Strip Map Introduction




**What is the purpose of crash strip maps?** The purpose is to give an overview crashes for the entire 80 mile study section grouped by Target Zero priorities.

**What are the strip maps showing me?** Along with roadway information you are seeing crash locations and crash densities based on modified Target Zero priority measures.

**Target Zero definitions modified in what way?** Target Zero priorities are defined by a crash type resulting in a serious or fatal injury, the following strip maps are based on all injury types, including crashes resulting in no injury.

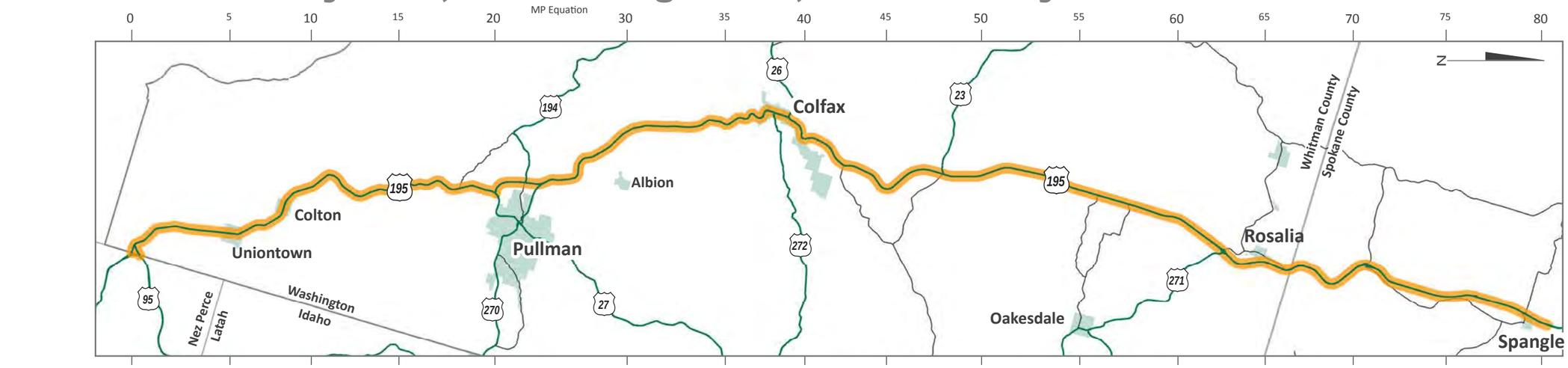
**What else do I need to know about these maps?** A single crash can be represented on more than one map. For example, a crash involving a contributing circumstances of exceeding reasonable speed and distracted driving will appear once on the map for exceeding reasonable speed and once again on the map representing distracted drivers.

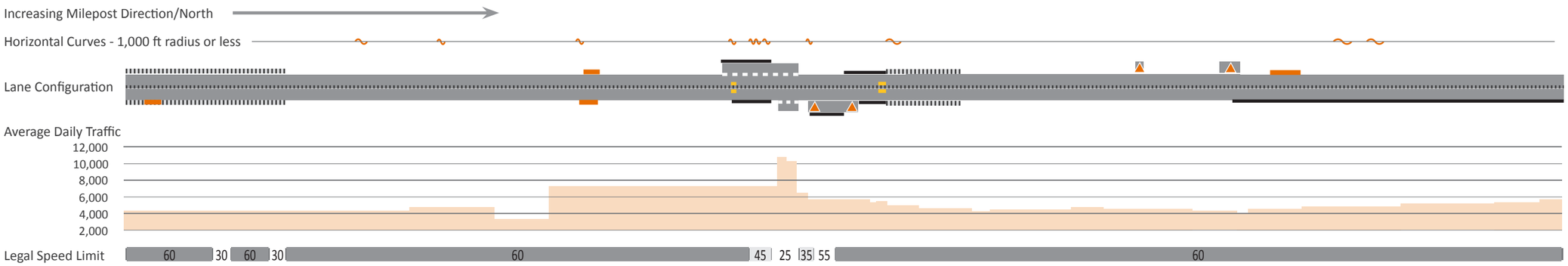
Also, locations indicating an increased crash density are not comparable between maps, the densities shown on each map are relative to that map only.

***Legend***

- *Crash Location*
- *Increased Crash Density*
- *State Route*
- *County Arterial*
- *Incorporated City*
- *Horizontal Curves 6° or More*
- *Two Way Turn Lane*
- *Slow Vehicle Shoulder Driving*
- *Truck Climbing Lane*
- *Shoulder Width 7 feet or less*
- *Shoulder Rumble Strips*
- *Centerline Rumble Strips*

# US 195 study area, route designation, and roadway character



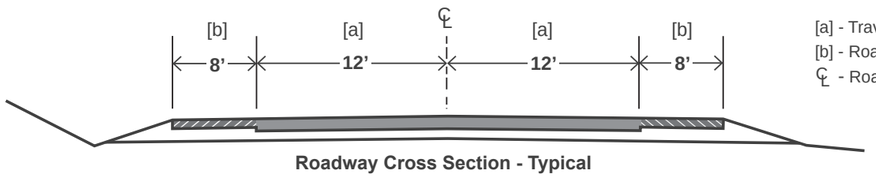

**Functional Classification:** Rural-Principal-Arterial.

**Freight and Goods Transportation System (FGTS) classification**: T2 - 4 million to 10 million tons per year.

**Highway of Statewide Significance (HSS):** Includes interstate highways and other principal arterials that are needed to connect major communities in the state.

**Terrain:** Rolling throughout length of study area. Terrain relates to the frequency and steepness of hills and the effect on truck speed. Rolling means trucks slow down frequently.

**Roadway Cross Section:** The majority of the study section is represented by the following cross section. For lane and shoulder width, number and type of lane details see WSDOT's State Highway Log 2010.

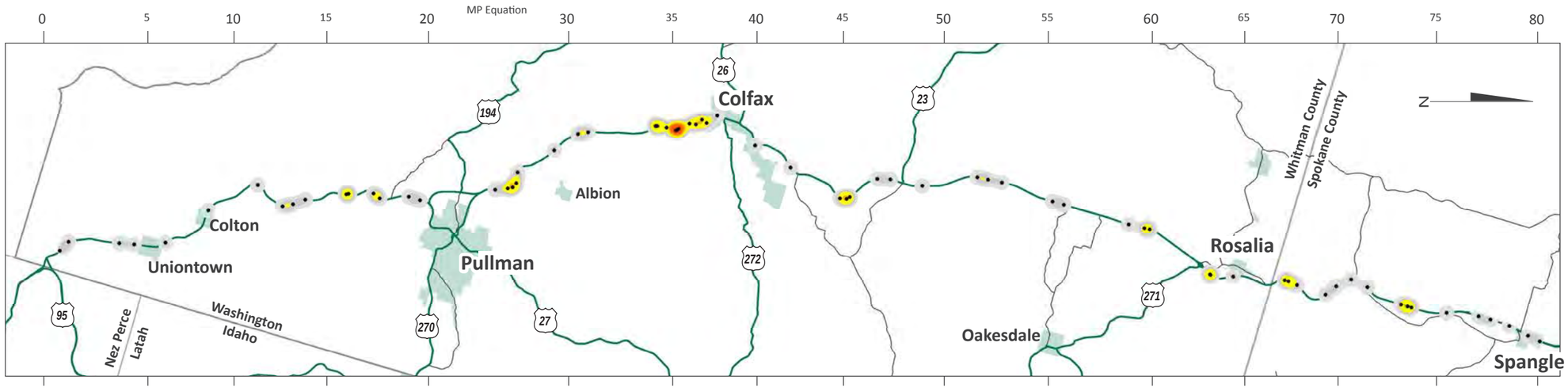



Roadway Cross Section - Typical

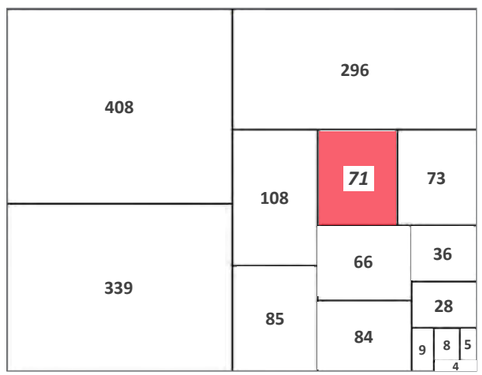
***Legend***

- *Study Area*
- *State Route*
- *County Arterial*
- *Incorporated City*
- *Horizontal Curves 6° or More*
- *Two Way Turn Lane*
- *Slow Vehicle Shoulder Driving*
- *Truck Climbing Lane*
- *Shoulder Width 7 feet or less*
- *Shoulder Rumble Strips*
- *Centerline Rumble Strips*

# US 195 - Opposite Direction




## Crash Count Compared to All Other Priorities by Proportion

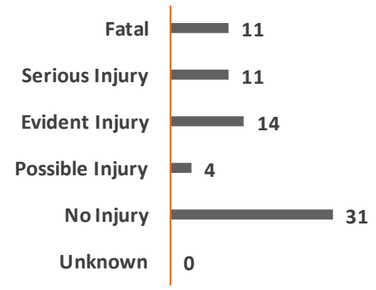



## Number of Vehicles Involved in each Crash Event

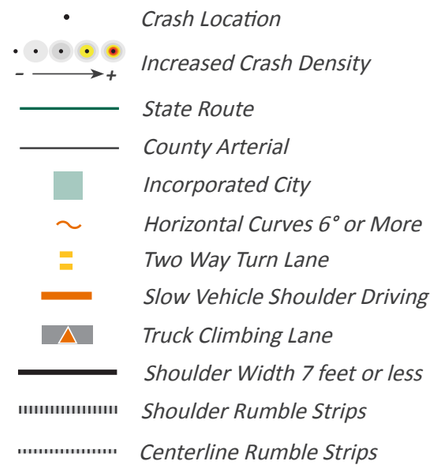
| Number of Events | Number of Vehicles Involved |
|---|---|
| 65 | 🚗🚗 |
| 6 | 🚗🚗🚗 |
| 71 | 148 |

*Opposite Direction*

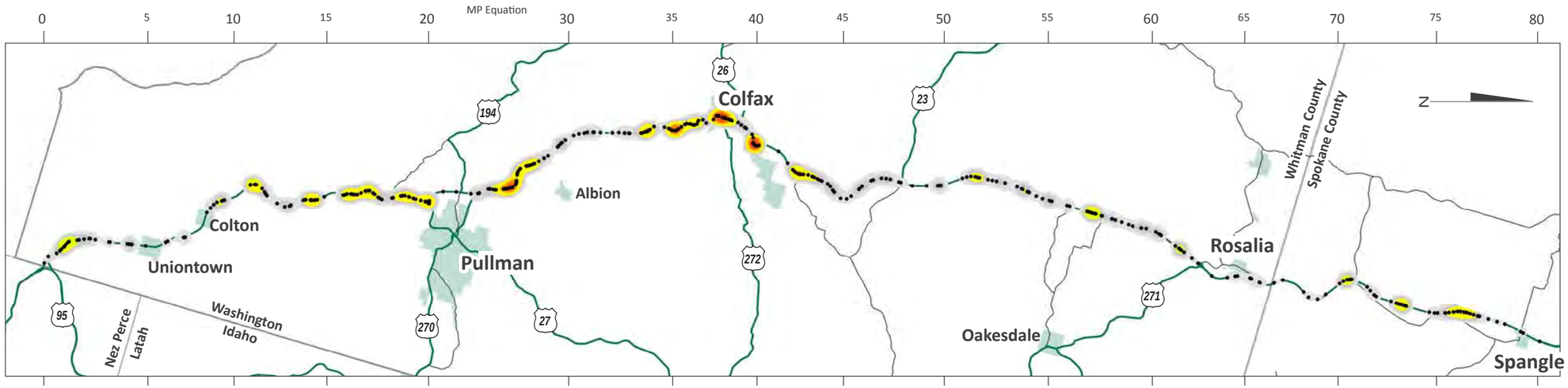
## Injury Severity




## Legend



# US 195 - Run-off-the-Road

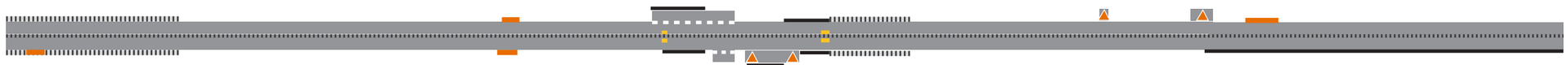



Increasing Milepost Directions/North

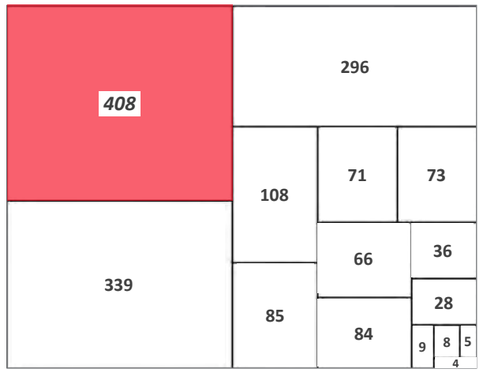
*The crash densities shown do not represent statistically significant frequencies or locations*

Horizontal Curves - 1,000 ft radius or less

Lane Configuration



### *Crash Count Compared to All Other Priorities by Proportion*

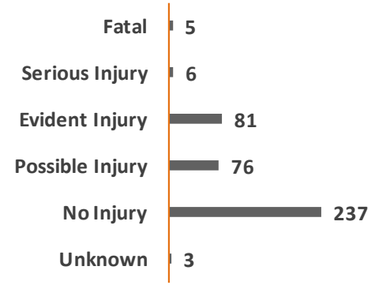



### *Number of Vehicles Involved in each Crash Event*

| Number of Events | Number of Vehicles Involved |
|---|---|
| 385 | 1 |
| 22 | 2 |
| 1 | 3 |
| 408 | 432 |

***Run-Off-the-Road***

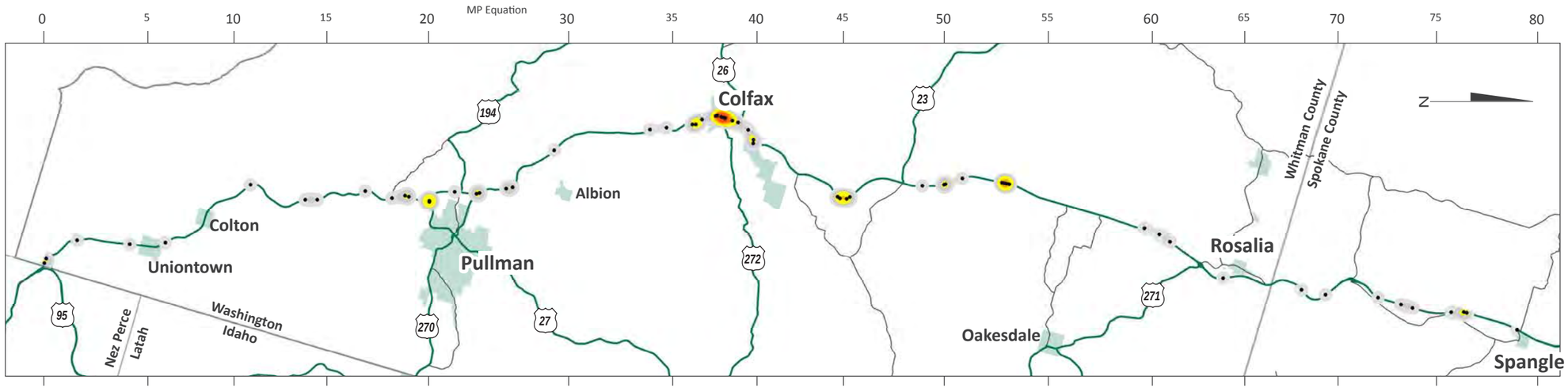
### *Injury Severity*




### *Legend*

- *Crash Location*
- *Increased Crash Density*
- *State Route*
- *County Arterial*
- *Incorporated City*
- *Horizontal Curves 6° or More*
- *Two Way Turn Lane*
- *Slow Vehicle Shoulder Driving*
- *Truck Climbing Lane*
- *Shoulder Width 7 feet or less*
- *Shoulder Rumble Strips*
- *Centerline Rumble Strips*

# US 195 - Heavy Truck



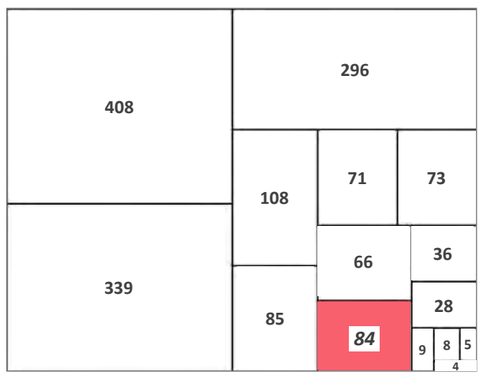

Increasing Milepost Directions/North

*The crash densities shown do not represent statistically significant frequencies or locations*

Horizontal Curves - 1,000 ft radius or less

Lane Configuration

### *Crash Count Compared to All Other Priorities by Proportion*

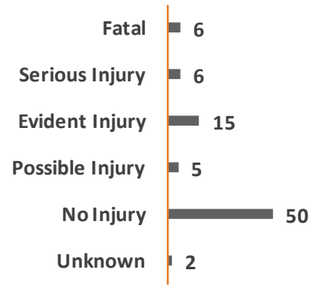



### *Number of Vehicles Involved in each Crash Event*

| Number of Events | Number of Vehicles Involved |
|---|---|
| 20 | 1 |
| 62 | 2 |
| 2 | 3 |
| 84 | 150 |

***Heavy Truck Involved***

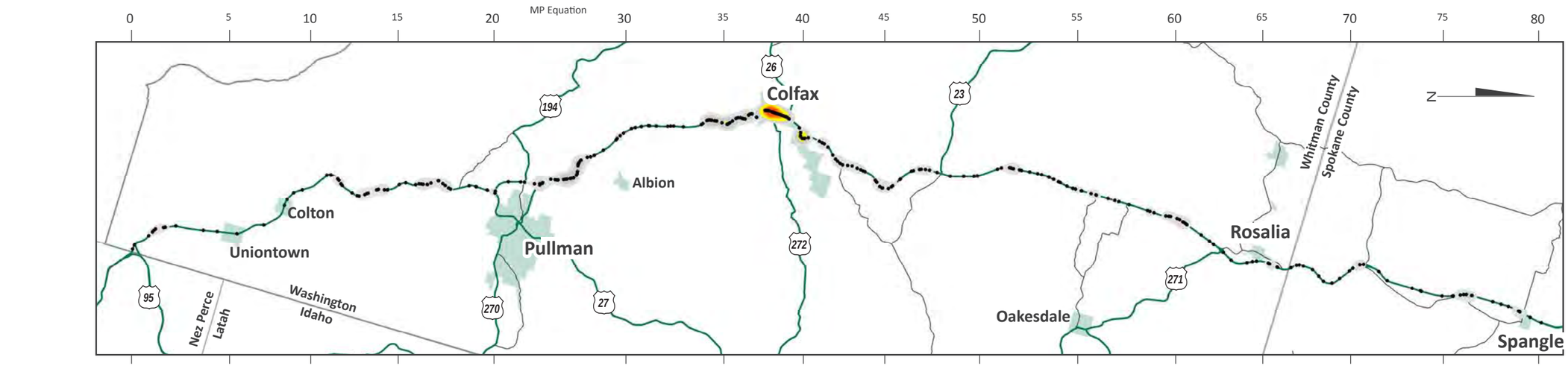
### *Injury Severity*




### *Legend*

- *Crash Location*
- *Increased Crash Density*
- *State Route*
- *County Arterial*
- *Incorporated City*
- *Horizontal Curves 6° or More*
- *Two Way Turn Lane*
- *Slow Vehicle Shoulder Driving*
- *Truck Climbing Lane*
- *Shoulder Width 7 feet or less*
- *Shoulder Rumble Strips*
- *Centerline Rumble Strips*

# US 195 - Young Drivers: Age 16-25




Increasing Milepost Directions/North

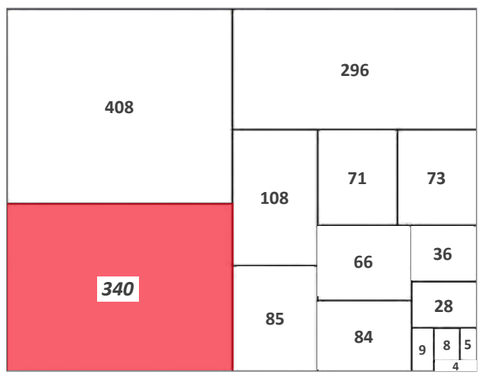
*The crash densities shown do not represent statistically significant frequencies or locations*

Horizontal Curves - 1,000 ft radius or less

Lane Configuration



### *Crash Count Compared to All Other Priorities by Proportion*

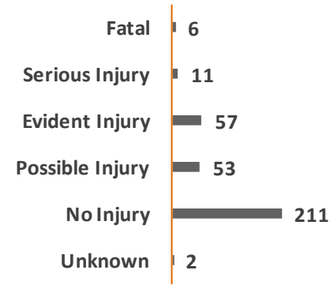



### *Vehicle Driver Involved by Priority*

| Number of Events | Number of Vehicles Involved |
|---|---|
| 200 | 1 |
| 123 | 2 |
| 15 | 3 |
| 1 | 4 |
| 1 | 5 |
| 340 | 500 |

***Young Drivers Involved***

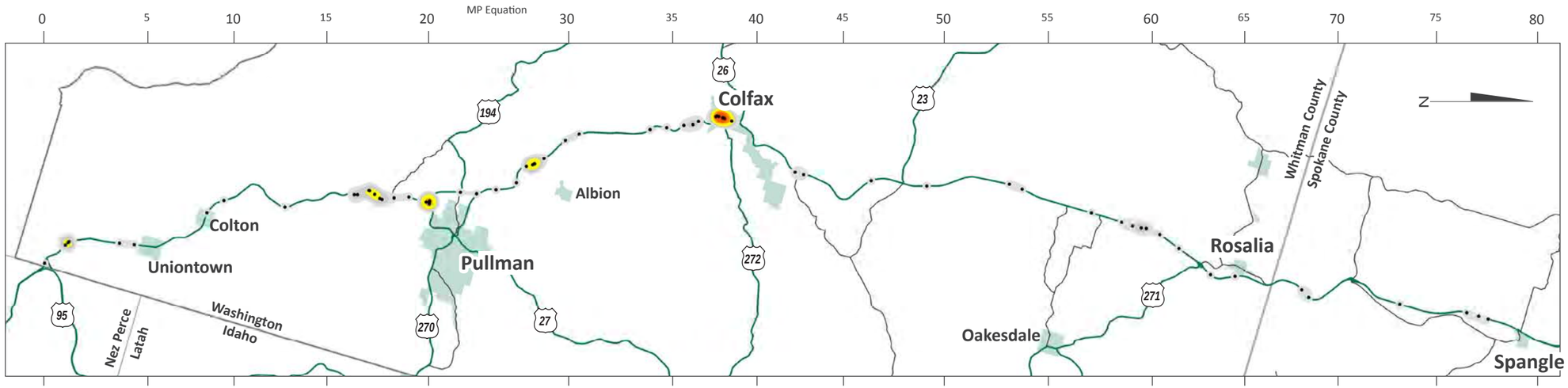
### *Injury Severity*




### *Legend*

- *Crash Location*
- *Increased Crash Density*
- *State Route*
- *County Arterial*
- *Incorporated City*
- *Horizontal Curves 6° or More*
- *Two Way Turn Lane*
- *Slow Vehicle Shoulder Driving*
- *Truck Climbing Lane*
- *Shoulder Width 7 feet or less*
- *Shoulder Rumble Strips*
- *Centerline Rumble Strips*

# US 195 - Distracted Driver



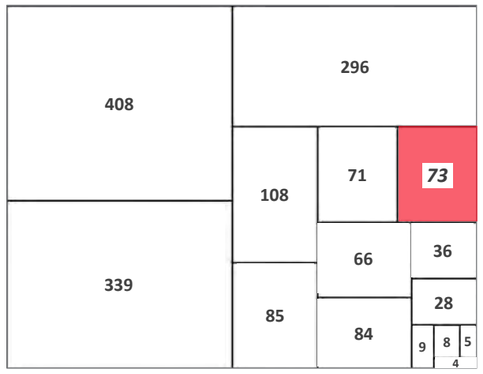

Increasing Milepost Directions/North

*The crash densities shown do not represent statistically significant frequencies or locations*

Horizontal Curves - 1,000 ft radius or less

Lane Configuration

## *Crash Count Compared to All Other Priorities by Proportion*

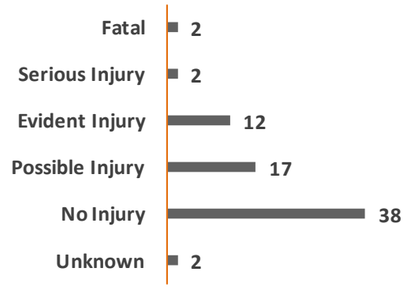



| Number of Events | Number of Vehicles Involved |
|---|---|
| 44 | 1 |
| 27 | 2 |
| 2 | 3 |
| 73 | 104 |

***Distracted Driver Involved***

## *Vehicle Driver Involved by Contributing Factor*

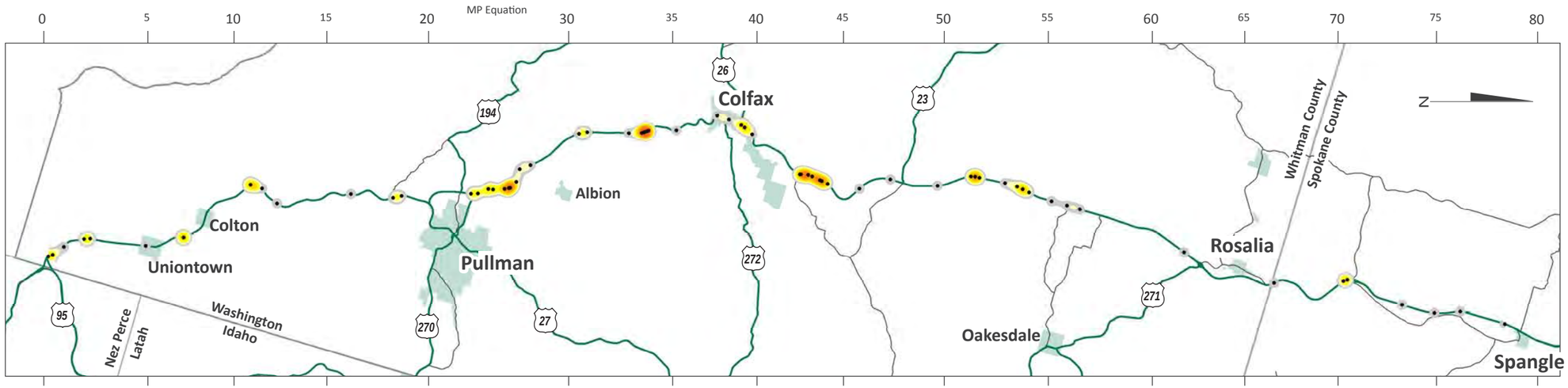
## *Injury Severity*




## *Legend*

- *Crash Location*
- *Increased Crash Density*
- *State Route*
- *County Arterial*
- *Incorporated City*
- *Horizontal Curves 6° or More*
- *Two Way Turn Lane*
- *Slow Vehicle Shoulder Driving*
- *Truck Climbing Lane*
- *Shoulder Width 7 feet or less*
- *Shoulder Rumble Strips*
- *Centerline Rumble Strips*

# US 195 - Drowsy Driver



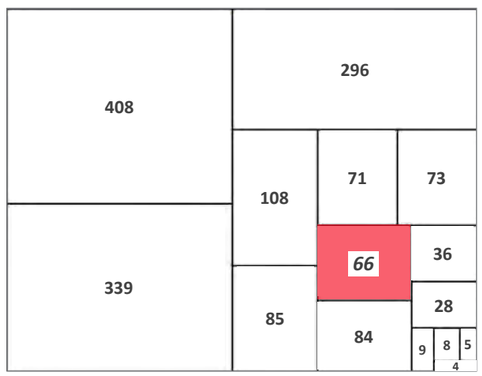

Increasing Milepost Directions/North

*The crash densities shown do not represent statistically significant frequencies or locations*

Horizontal Curves - 1,000 ft radius or less

Lane Configuration

### *Crash Count Compared to All Other Priorities by Proportion*

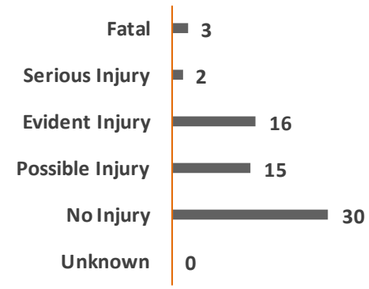



### *Vehicle Driver Involved by Contributing Factor*

| Number of Events | Number of Vehicles Involved |
|---|---|
| 61 | 🚗 |
| 5 | 🚗🚗 |
| 66 | 71 |

*Drowsy Driver Involved*

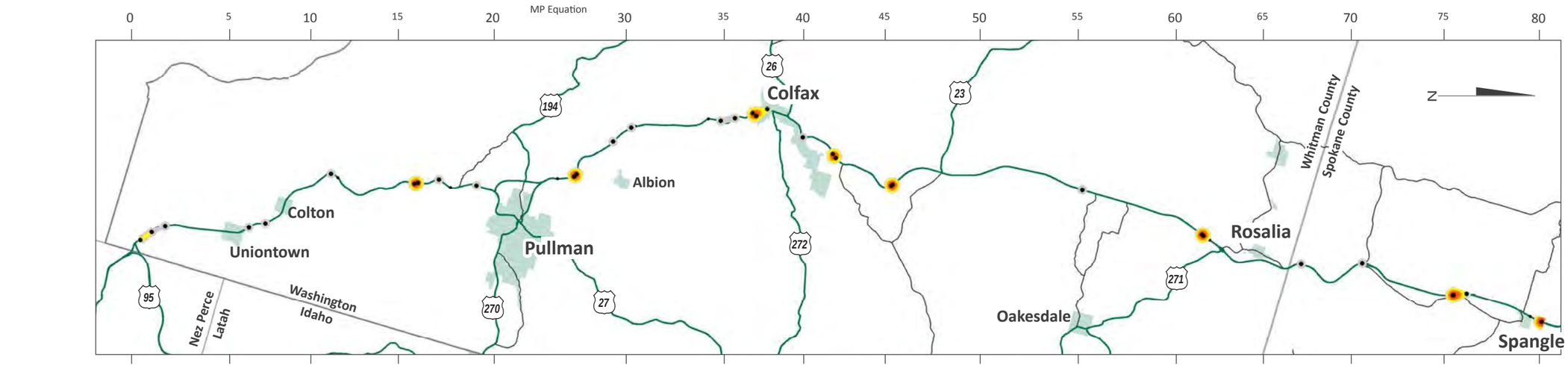
### *Injury Severity*



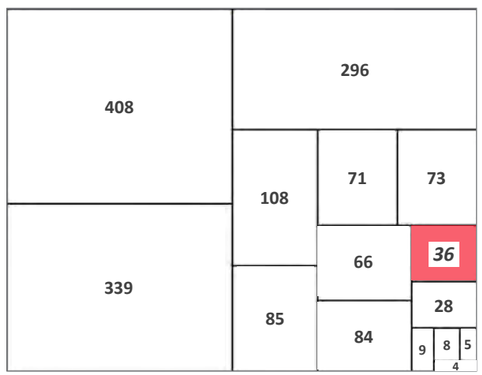

### *Legend*

- *Crash Location*
- *Increased Crash Density*
- *State Route*
- *County Arterial*
- *Incorporated City*
- *Horizontal Curves 6° or More*
- *Two Way Turn Lane*
- *Slow Vehicle Shoulder Driving*
- *Truck Climbing Lane*
- *Shoulder Width 7 feet or less*
- *Shoulder Rumble Strips*
- *Centerline Rumble Strips*

# US 195 - Alcohol and/or Drugs Involved




## Crash Count Compared to All Other Priorities by Proportion




## Vehicle Driver Involved by Contributing Factor

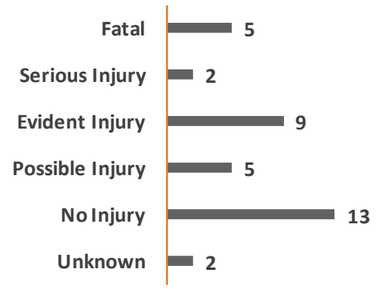
| Number of Events | Number of Vehicles Involved |
|---|---|
| 23 | 🚗 |
| 13 | 🚗🚗 |
| 36 | 49 |

### Alcohol and or Drugs Involved

| | |
|---|---|
| Ability impaired | 23 |
| Ability not impaired | 4 |
| Sobriety unknown | 3 |
| Had not been drinking, under influence of Drugs | 5 |

Note: One driver was under the influence of alcohol and drugs

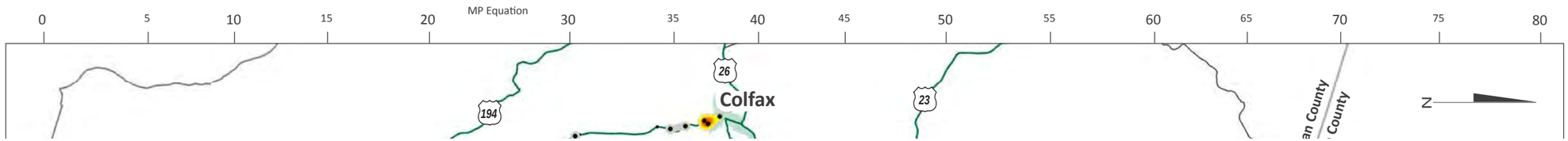
## Injury Severity



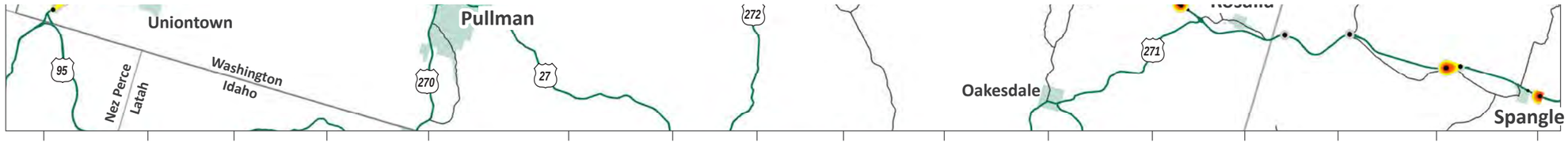

## Legend

- Crash Location
- Increased Crash Density
- State Route
- County Arterial
- Incorporated City
- Horizontal Curves 6° or More
- Two Way Turn Lane
- Slow Vehicle Shoulder Driving
- Truck Climbing Lane
- Shoulder Width 7 feet or less
- Shoulder Rumble Strips
- Centerline Rumble Strips

# US 195 - Aggressive driver involved




## *Crash Locations and Analysis System data not available*

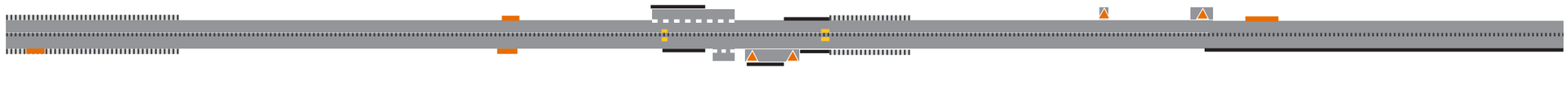



Increasing Milepost Directions/North

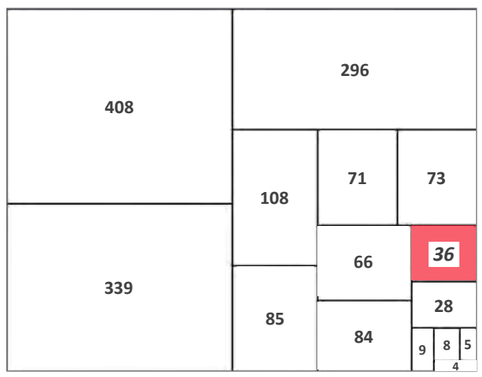
*The crash densities shown do not represent statistically significant frequencies or locations*

Horizontal Curves - 1,000 ft radius or less

Lane Configuration



### *Crash Count Compared to All Other Priorities by Proportion*



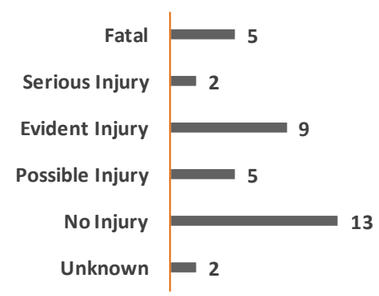

### *Vehicle Driver Involved by Contributing Factor*

| Number of Events | Number of Vehicles Involved |
|---|---|
| 23 | 🚗 |
| 13 | 🚗🚗 |
| 36 | 49 |

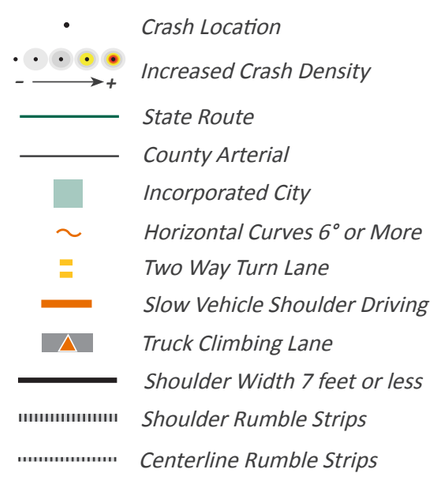
| | |
|---|---|
| Ability impaired | 23 |
| Ability not impaired | 4 |
| Sobriety unknown | 3 |
| Had not been drinking, under influence of Drugs | 5 |

Note: One driver was under the influence of alcohol and drugs

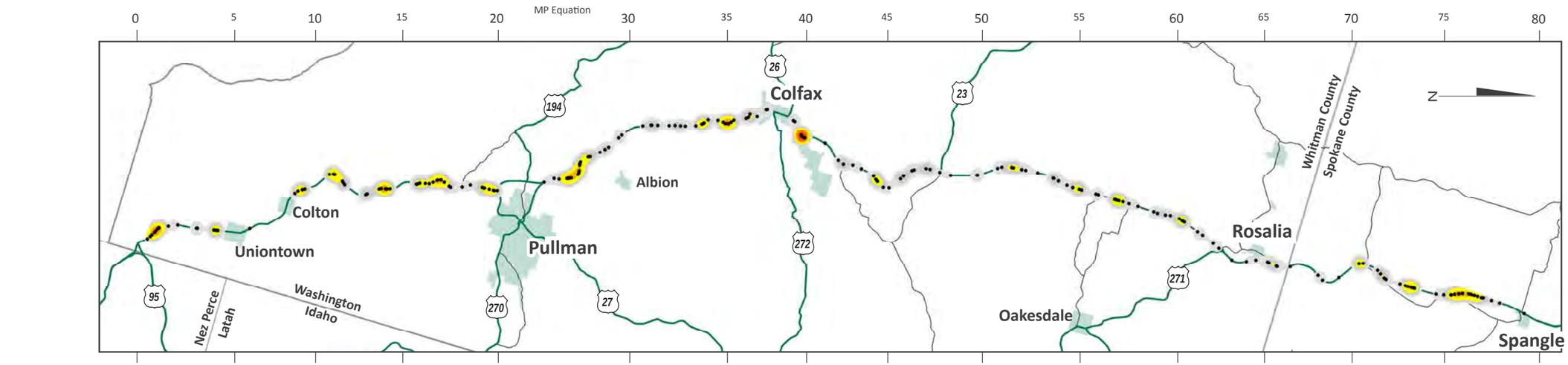
### *Injury Severity*




### *Legend*



# US 195 - Speeding



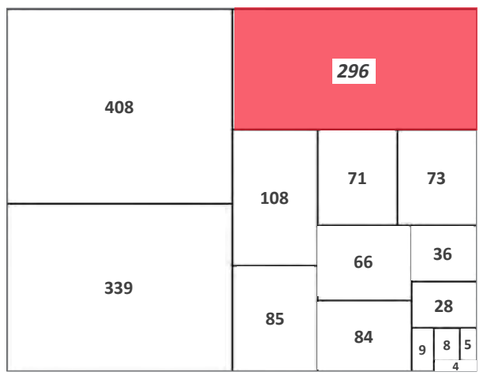

Increasing Milepost Directions/North

*The crash densities shown do not represent statistically significant frequencies or locations*

Horizontal Curves - 1,000 ft radius or less

Lane Configuration

## *Crash Count Compared to All Other Priorities by Proportion*



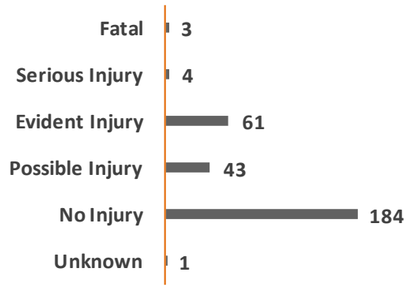

## *Vehicle Driver Involved by Contributing Factor*

| Number of Events | Number of Vehicles Involved |
|---|---|
| 229 | 1 |
| 60 | 2 |
| 7 | 3 |
| 296 | 370 |

***Speeding Driver Involved***

| | |
|---|---|
| Exceeding Posted Speed Limit | 10 |
| Exceeding Reasonable Speed for Conditions | 286 |

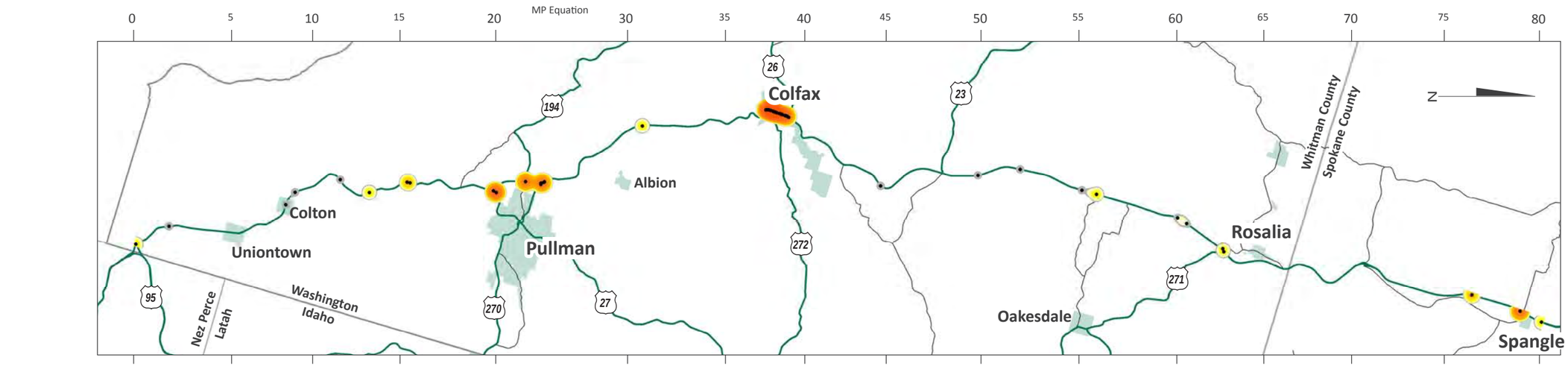
## *Injury Severity*




## *Legend*

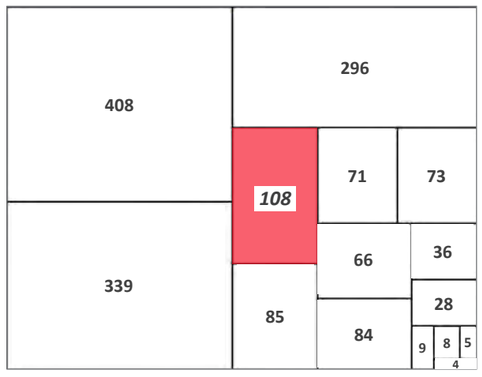
- *Crash Location*
- *Increased Crash Density*
- *State Route*
- *County Arterial*
- *Incorporated City*
- *Horizontal Curves 6° or More*
- *Two Way Turn Lane*
- *Slow Vehicle Shoulder Driving*
- *Truck Climbing Lane*
- *Shoulder Width 7 feet or less*
- *Shoulder Rumble Strips*
- *Centerline Rumble Strips*

# US 195 - Intersections




Draft

### *Crash Count Compared to All Other Priorities by Proportion*

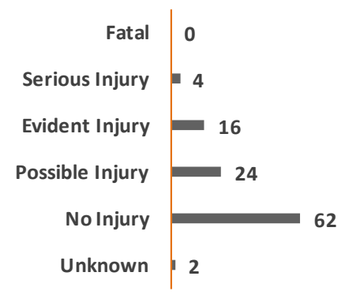



### *Number of Vehicles Involved in each Crash Event*

| Number of Events | Number of Vehicles Involved |
|---|---|
| 10 | 1 |
| 92 | 2 |
| 5 | 3 |
| 1 | 4 |
| 108 | 213 |

***Intersection Crashes***

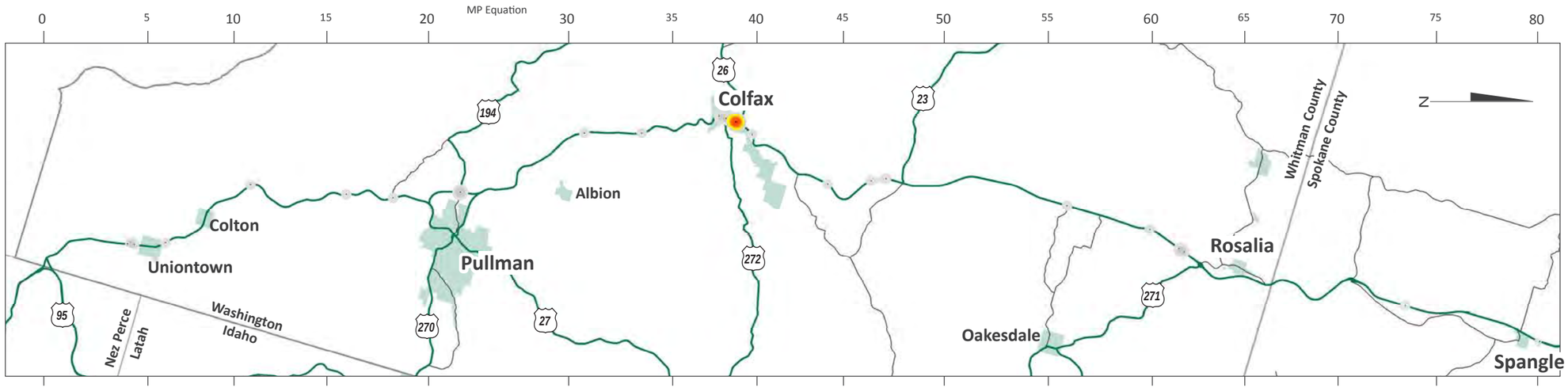
### *Injury Severity*




### *Legend*

- *Crash Location*
- *Increased Crash Density*
- *State Route*
- *County Arterial*
- *Incorporated City*
- *Horizontal Curves 6° or More*
- *Two Way Turn Lane*
- *Slow Vehicle Shoulder Driving*
- *Truck Climbing Lane*
- *Shoulder Width 7 feet or less*
- *Shoulder Rumble Strips*
- *Centerline Rumble Strips*

# US 195 - Older Driver



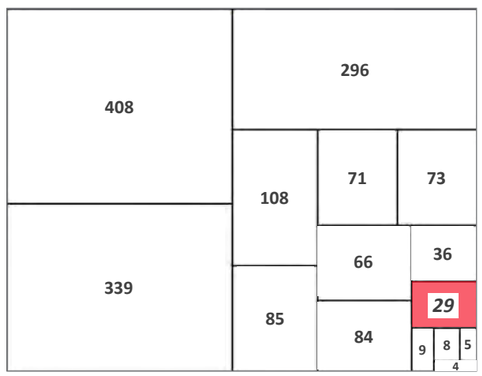

Increasing Milepost Directions/North

*The crash densities shown do not represent statistically significant frequencies or locations*

Horizontal Curves - 1,000 ft radius or less

Lane Configuration

### *Crash Count Compared to All Other Priorities by Proportion*

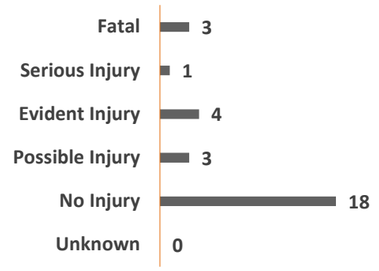



### *Vehicle Driver Involved by Priority*

| Number of Events | Number of Vehicles Involved |
|---|---|
| 13 | 🚗 |
| 15 | 🚗🚗 |
| 1 | 🚗🚗🚗 |
| 29 | 46 |

***Older Driver Involved***

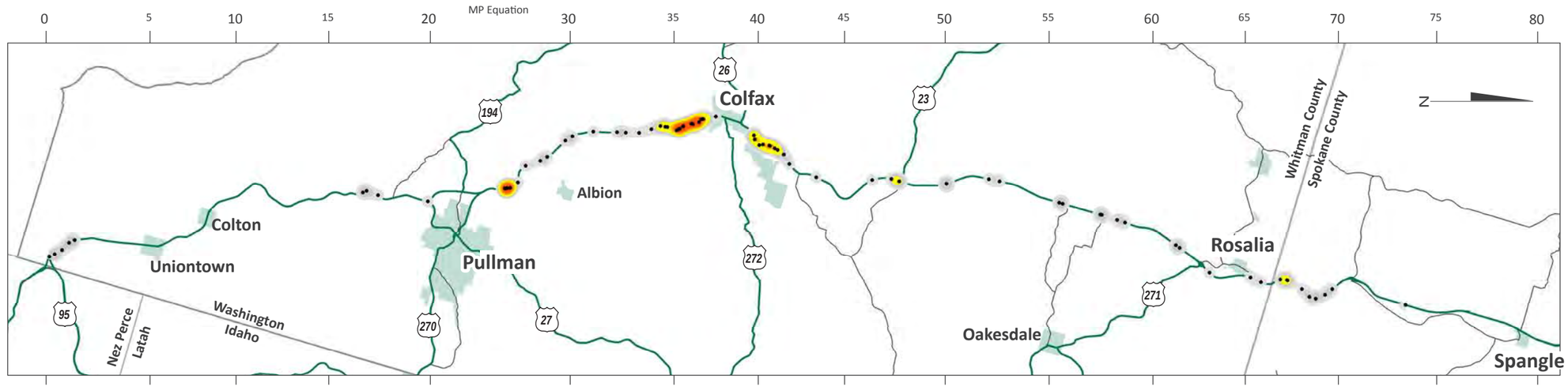
### *Injury Severity*




### *Legend*

- *Crash Location*
- *Increased Crash Density*
- *State Route*
- *County Arterial*
- *Incorporated City*
- *Horizontal Curves 6° or More*
- *Two Way Turn Lane*
- *Slow Vehicle Shoulder Driving*
- *Truck Climbing Lane*
- *Shoulder Width 7 feet or less*
- *Shoulder Rumble Strips*
- *Centerline Rumble Strips*

# US 195 - Wildlife



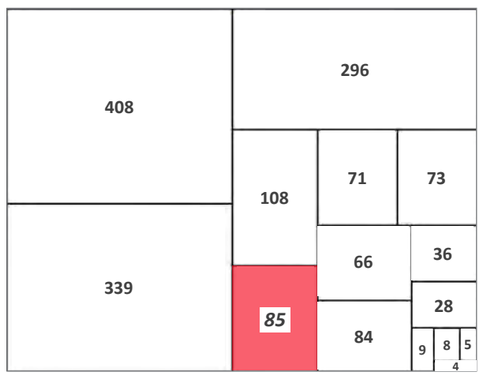

Increasing Milepost Directions/North

*The crash densities shown do not represent statistically significant frequencies or locations*

Horizontal Curves - 1,000 ft radius or less

Lane Configuration

### *Crash Count Compared to All Other Priorities by Proportion*

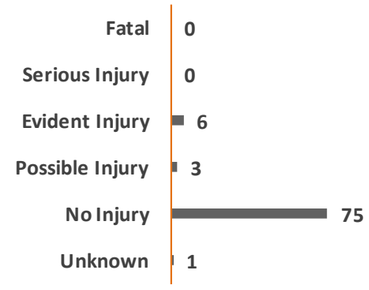



### *Number of Vehicles Involved in each Crash Event*

| Number of Events | Number of Vehicles Involved |
|---|---|
| 85 | |
| 85 | 85 |

***Wildlife Involved***

### *Injury Severity*




### *Legend*

- *Crash Location*
- *Increased Crash Density*
- *State Route*
- *County Arterial*
- *Incorporated City*
- *Horizontal Curves 6° or More*
- *Two Way Turn Lane*
- *Slow Vehicle Shoulder Driving*
- *Truck Climbing Lane*
- *Shoulder Width 7 feet or less*
- *Shoulder Rumble Strips*
- *Centerline Rumble Strips*

# Additional Analysis

## What did we learn from a statistical analysis?

A limited statistical analysis was conducted to see what else we might learn and if there were some areas of the data that may need further review.

There were 768 crashes on the corridor during the 2005 to 2009 five year study period.

## An analysis of the relationship between lighting condition and roadway surface

This study uses two variables: lighting condition and the roadway surface condition. The lighting condition has six levels with daylight as reference levels, and the roadway surface condition has five levels as shown.

| Lighting Condition | Roadway Surface Condition |
|---|---|
| 1-Dark-No-Street Lights | 1-Icy |
| 2-Dark-Street Lights Off | 2-Snowy |
| 3-Dark-Street Lights On | 3-Water (Water on the roads) |
| 4-Dawn | 4-Wet |
| 5-Dusk | 5-Dry |
| 6-Daylight | |

This analyses shows that dark or low lighting and roads surface conditions combinations relatively have higher odds ratio estimates (high point estimate and 95% Wald Confidence Limits). Those variables are Ice and Dark-No Street Lights; Ice and Dawn; Wet and Dark-No-Street Light; Wet and Dawn; and Wet and Dusk.

**Data interpretation:** There is a higher instance of crashes in dark and icy conditions

## An analysis relationship between Injury type and driver age

This study determines any general or particular injury type depending on the age of the driver. The injury type is broken into five levels.

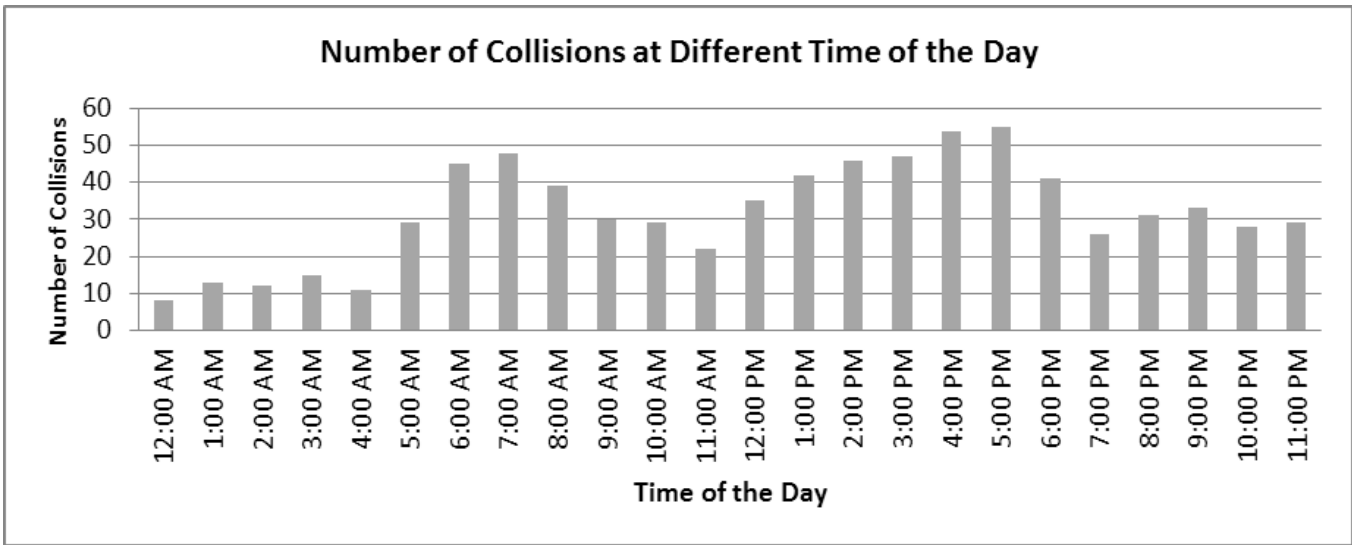
The cumulative logistic regression model is much effective and efficient in this particular case to detect the relationship. The model gives the Likelihood Ratio G2 =1.7609, and P-Value = 0.1845>0.05. In conclusion, the study shows no connection between crash injury type and the age of the driver.

| Injury Type |
|---|
| 1 No Injury |
| 2 Possible Injury |
| 3 Evident Injury |
| 4 Serious Injury |
| 5 Fatality |

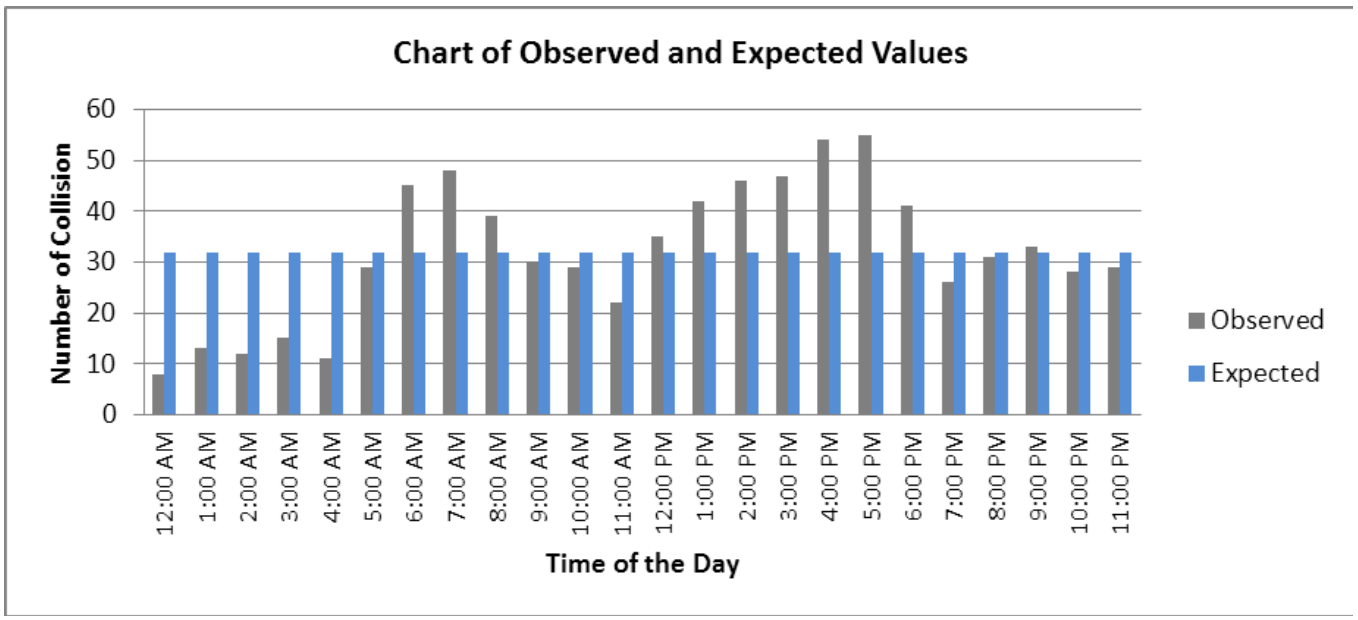
**Data interpretation:** There is no connection between injury type and driver age.

# Additional Analysis

## An analysis of the number of crash at different time of the day and analysis of relationship between driver age and time of the day




This analysis includes 768 crashes related by the hour of the day. The statistical calculation gives CHI-Sq value 135.938 and P-Value 0. that highlights some correlation between the crashes and time of the day. The observed and expected crashes at different time of the day are shown on the chart above.

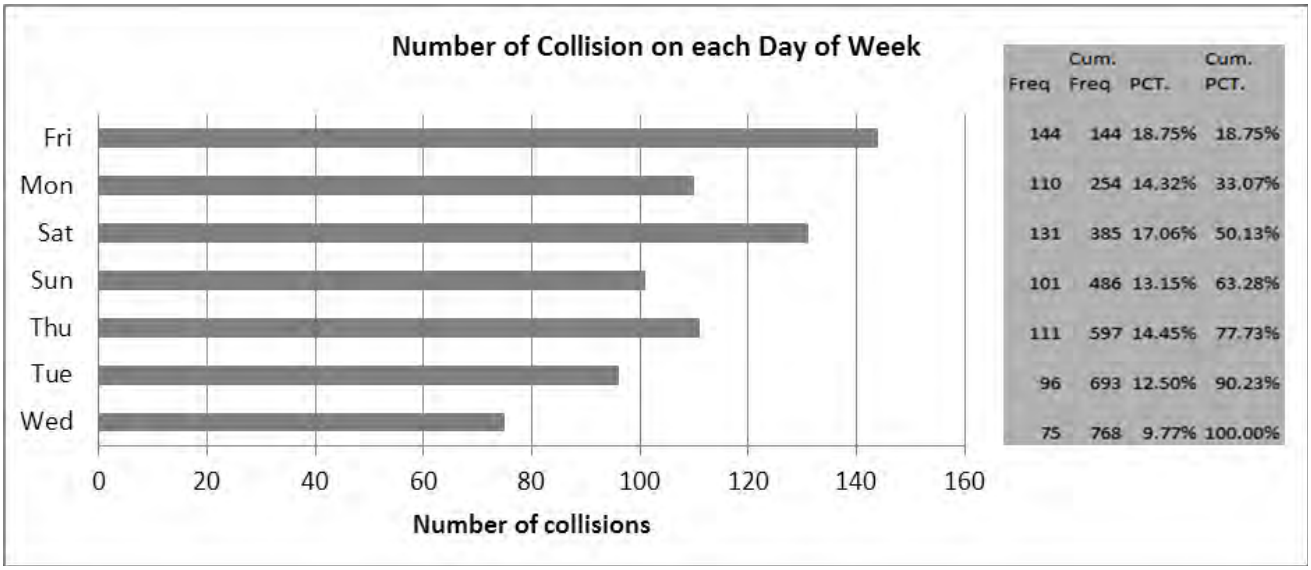


# Additional Analysis

The analyses shows that the number of crashes is significantly below average between 1:00 AM to 5:00 AM, while significantly above average in the hours between 7:00 AM-8:00 AM and 3:00 PM-6:00 PM. The analysis of relationship between Driver Age and Time of the Day shows no evidence of relationship between driver age and time of the day.

**Data interpretation:** There is no relationship between driver age and time of day.

## An analysis of the number of crashes by day of the week




| Freq | Cum. Freq | PCT. | Cum. PCT. |
|---|---|---|---|
| 144 | 144 | 18.75% | 18.75% |
| 110 | 254 | 14.32% | 33.07% |
| 131 | 385 | 17.06% | 50.13% |
| 101 | 486 | 13.15% | 63.28% |
| 111 | 597 | 14.45% | 77.73% |
| 96 | 693 | 12.50% | 90.23% |
| 75 | 768 | 9.77% | 100.00% |

The Chi-Square Goodness-of-Fit Test gives a Chi- square =28.25 and P-value 0.000. The null hypothesis cannot be rejected in this case. The analysis shows differences in the number of crash depending on the day of the week. Friday and Saturday have higher number of crashes while a typical Wednesday has the lower number of crashes. That may be due to more trips on the weekends. However, further study might help understand the correlation between the number of crashes and the days of week.

**Data interpretation:** The number of crashes is elevated on Friday and Saturday.

# Additional Analysis

## An analysis of the difference between events day and normal days

This table highlights the number of crashes on normal days compared to the event days. Based on the 768 crashes in our data, and in 1825 days, the average rate of crash is 0.421, and typical none-event weekdays had rate of 0.386 crashes per day.

| Event Days and Holidays | Number of days | Number of crashs | Number of crashes/days |
|---|---|---|---|
| Totals | 1825 | 768 | 0.421 |
| Football game days | 27 | 9 | 0.273 |
| Mom's weekend | 15 | 8 | 0.533 |
| Dad's weekend | 15 | 12 | 0.800 |
| Long weekend | 92 | 41 | 0.446 |
| Thanksgiving break | 45 | 33 | 0.733 |
| All events | 185 | 99 | 0.535 |
| All events and weekends | 586 | 289 | 0.493 |
| Other days | 1239 | 479 | 0.386 |

Dad's day weekend spiked to 0.800 crashes per day, and the Thanksgiving holiday 0.733 crashes per day. These higher rates of crashes indicate a concern.

**Data interpretation:** The Dad's day weekend and the Thanksgiving holiday have an increased rate of crashes.

# Community Task Force

## Why is a community based traffic safety task force important?

"Experience has shown that local government and community institutions are often more effective at addressing their traffic safety issues than more centralized levels of government. This is especially true in the areas of education and enforcement ... Community-based responses to traffic safety problems should be strongly encouraged." **AASHTO Strategic Highway Safety Plan CHRP Project 17-18**

Community safety programs that are initiated at the local level typically mobilize support and selected leadership at the local level. "Target Zero" is a daring attempt by Washington State highway safety officials to challenge the state's highway safety community to build on and exceed current safety program effectiveness with innovation and the refusal to accept any level of crashes that result in major injury or death.

## How effective is a community based traffic safety task force?

The following presents the crash-reduction impacts of twenty-nine corridor projects led by a community based task force sponsored by the Washington Traffic Safety Commission:

- 34% Reduction in fatal and serious injury crashes;
- 15% Reduction in alcohol-related crashes;
- 11% Reduction in total injuries;
- 5% Reduction in total crashes;

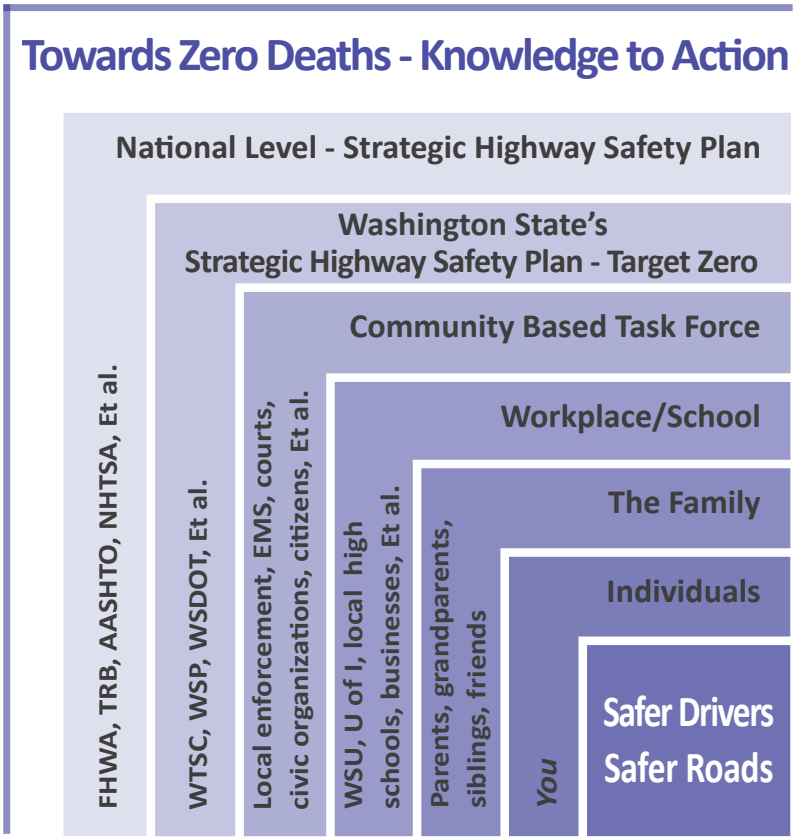
The benefit/cost ratio for these projects was $25:$1. In other words, for each dollar spent there was a twenty-five dollar measurable benefit.

**Source: Washington State's Strategic Highway Safety Plan presentation, November 2009, Boise Idaho**

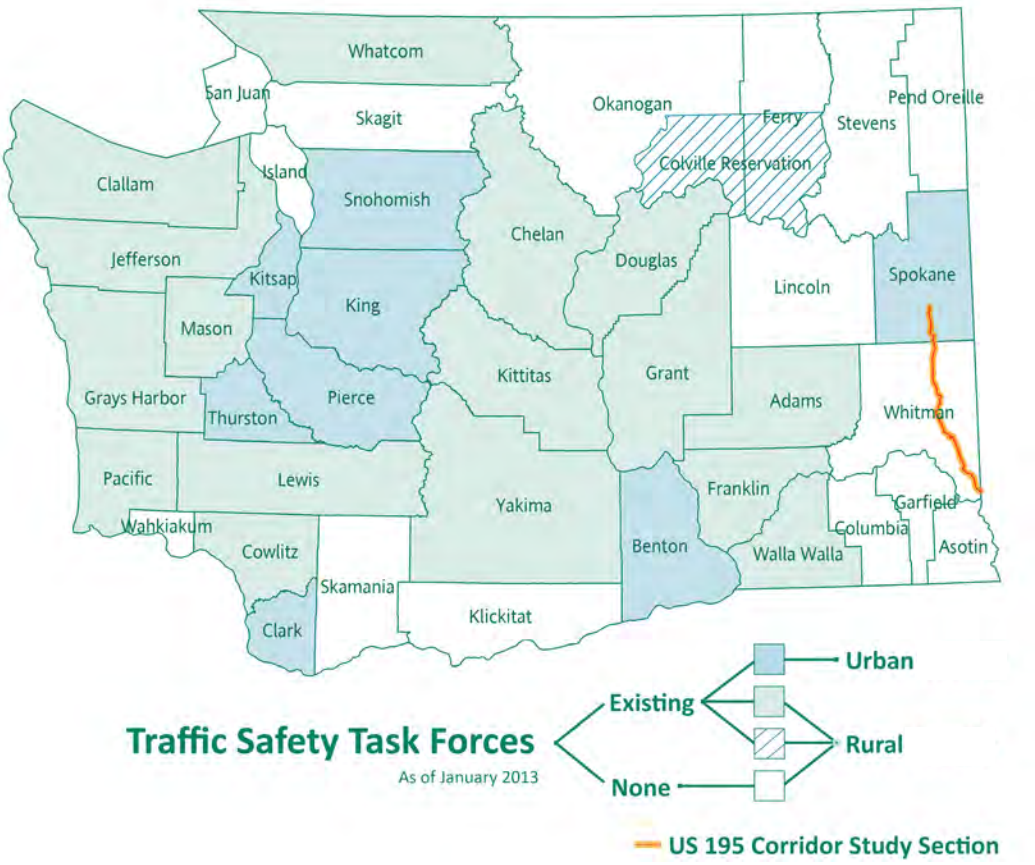
## What is the role of a US 195 community based task force?

A community based task force advocates for traffic safety.

Their role is to create a vision, build coalitions, establish a local plan, implement the plan, measure results, and revise the plan.



# Community Task Force




## What would a community based task force look like?

A Whitman County task force might look like the following:

**County**

Whitman County Engineering

Spokane County Engineering

County Environmental Health

County Sheriff

County Prosecutor's Office

County Superior Court

County District Court

County Commissioners

Emergency Medical Responders

**Municipal**

Local Police Departments

Local City Officials

Emergency Medical Responders

**Civic**

Civic/Community Organizations

Citizens

Local Businesses

# Community Task Force

**Schools**

Washington State University

University of Idaho

Local High School Districts

**State**

Washington Traffic Safety Commission

Washington State Patrol

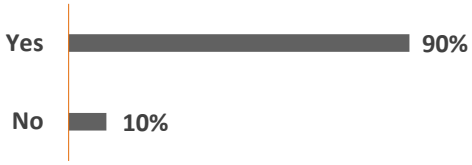
Washington State Department of Transportation

Washington State Department of Licensing

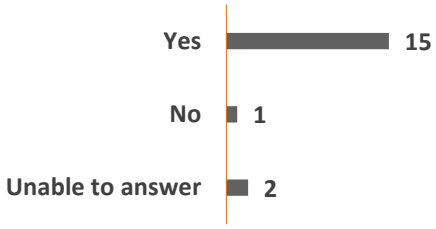
## What did the US 195 Technical Advisory Committee have to say about starting a US 195 Community Based Task Force?

As a follow-up to our meetings we asked members of the Technical Advisory Committee these questions:

### Do you think a community based Task Force is the best way to move forward?




### Do you see your organization participating as a member on this Task Force?




## What are the next steps?

Washington State Department of Transportation Eastern Region Planning will facilitate the creation of a “grass roots” community based task force.

This community based task force will include many of those organizations that participated as member’s of the US 195 study’s Technical Advisory Committee and include other interested parties.

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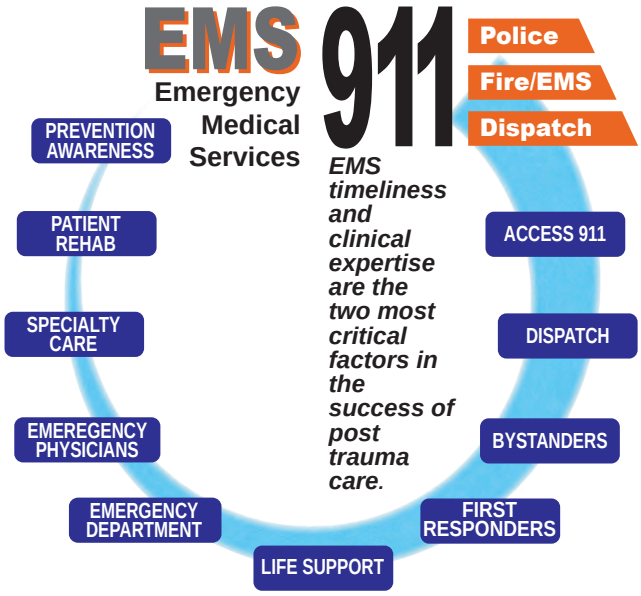
# Emergency Medical Services

## Why are Emergency Medical Services addressed as part of the US 195 Corridor Study?

After a crash, specialized medical care responders can literally mean the difference between life and death. Response time and clinical expertise are the two most critical factors in the success of post trauma care, as well as the leading reason for the steady decrease in the number of motor vehicle related deaths and serious injuries. Therefore, Emergency Medical Service (EMS) has been identified as a link towards the reduction of serious injury and fatal crashes on the US 195 Corridor.

For patients who cannot breathe, who are in hemorrhagic shock, or are in cardiac arrest, the decisions made and actions taken by EMS personnel may determine the outcome, as much as the subsequent hospital-based care—and may mean the difference between life and death. Aligning with the Target Zero goals, this study explores opportunities to improve existing emergency medical services and pinpoint future resource needs of the corridor. To understand how to best care for crash victims, we asked ourselves... What will it take to potentially prevent a serious injury from being a fatality?




This diagram illustrates the EMS system of emergency medical care. When activated by an incident, the focus of EMS is emergency medical care of the patient(s). EMS is most easily recognized when emergency vehicles or helicopters are seen responding to emergency incidents. But EMS is much more than a ride to the hospital, it is a system of coordinated response and emergency medical care, involving multiple people and agencies.

Team of Providers — Exhibit EMS - 1.

## What services are provided by the Emergency Medical Services system?

The EMS system not only includes medical response to disasters, it provides planning for and provisions of medical coverage at mass gatherings, as well as the interfaculty transfers of patients. It is because of these many facets of emergency medical duties that we have chosen to limit our scope of Emergency Medical Services in this chapter and focus primarily on ways to improve the system following a traffic incident. From the time a 911 emergency call is received and emergency personnel are dispatched to the scene, to providing triage (prioritized) treatment and transport of patients by ambulance and/or air lifted to the hospital.

## What does Target Zero say about the significance of EMS?

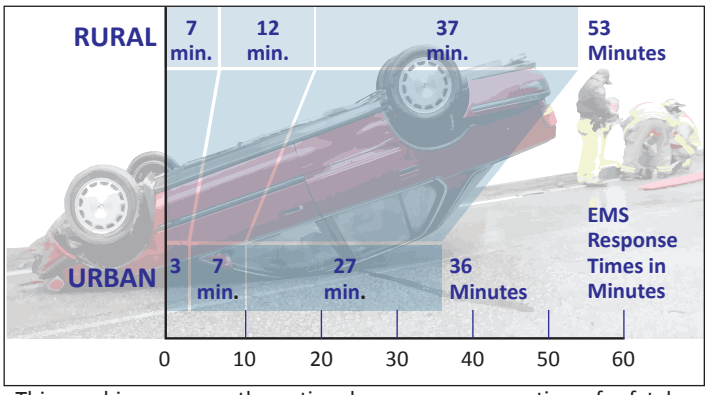
Washington's Emergency Medical Services and Trauma Care (EMSTC) System (or EMS) has contributed to a steady decrease in the number of motor vehicle related deaths. First, by providing critical care as soon as possible after a traffic related incident injury, EMS is helping reduce deaths and serious injuries. The minutes directly following a traumatic injury are often critical to saving lives or minimizing the long term effects of injury; timeliness and clinical expertise are critical factors in the success of post trauma care.

In addition to the minutes immediately following an injury, a patient's success is dependent on other important facets of trauma care; including prevention activities, hospital care, and the availability of rehabilitation resources. Each of these components work together to reduce deaths and disabilities of injured people throughout Washington.

# Emergency Medical Services

Washington's trauma care system strives to assure that the "right" patient arrives at the "right" facility in the "right" amount of time, and the importance of triage for severely injured patients getting them to the highest level trauma center. The fact is that the overall risk of death is "significantly lower when care is provided in a trauma center rather than a non-trauma center." This highlights the importance of a well-coordinated system that ensures severely traumatized patients arrive at the most appropriate level of trauma center, in the most optimum time span.

In order for the EMS system to continue its successes, we must strive to improve the following: analysis of response time data; communication between response agencies; use of medical dispatch protocols in every EMS dispatch center; and statewide implementation of GPS technology to ensure better response times. Build partnerships and improving data systems are important to continued success.




This graphic compares the national average response times for fatal crashes in rural and urban environments, as reported by National Highway Traffic Safety Administration (NHTSA). The exhibit divides response time into three time intervals. The exhibit reveals that average response times for each of the intervals is greater in rural areas than in urban areas.

**National Average Response Times — Exhibit EMS - 2.**

## What unique challenges, within the US 195 Corridor, do rural EMS providers face?

Rural crashes present unique challenges for US 195 Corridor EMS providers, response and transportation times are typically longer due to the vast distances and length of the study section corridor (81 miles) and the distance between medical facilities and rural residents. The sparse and aging rural population are additional contributing factors to the higher costs and increase demands for emergency medical services. This coupled with fewer tax dollars allocated to fund programs and service has put a financial strain on the system. Another ongoing challenge is that only a few of the communities within the corridor have paid EMS personnel. Many rely heavily upon volunteers, who often work full-time in non-EMS related vocations within the community, yet continue to donate their personal time to provide pre-hospital care. Limited access and funding for training for volunteers and paid EMS personnel, dated medical equipment, insufficient communications systems, inadequate insurance reimbursement or no payment at all for services make rural EMS an area of critical concern.

## What is the role of the East Region EMS and Trauma Care Council?

The East Region EMS and Trauma Care Council is the localized lead agency that actively promotes the regions emergency medical services system. Their role is to establish a consensus among their diverse membership of health care professionals and industry experts to address the complex political, economic, logistical, legal and clinical issues associated with trauma care, for the nine counties of the region: Adams, Asotin, Ferry, Garfield, Lincoln, Pend Oreille, Spokane, Stevens and Whitman. The council disseminates information to committee members, EMS & hospital providers and community partners regarding the emergency care system. Members include:

- Local EMS/TC councils
- Trauma designated healthcare facilities
- Elected officials
- Law enforcement
- Government agencies
- Helicopter services
- Fire and Emergency Medical Services
- Consumers
- Public health and more.

# Emergency Medical Services

## What EMS needs and challenges have been identified by local agencies and stakeholders for the US 195 Corridor?

At previous Technical Advisory Committee (TAC) meetings the following EMS needs and challenges were identified.

The **"need for addition funding"** to:

- Hire more full time emergency medical responders.
- Hire a full time permanent Basic EMT to be stationed at the firehouse in Rosalia.
- Support advanced training of volunteers to become certified EMT's at the Intermediate Level.
- Replace aging or inadequate medical equipment.
- Upgrade the existing radio system to a 700 or 800 MHz interoperable system; where all equipment would be able to seamlessly integrate with other equipment, to improve communications between EMS agencies.
- Supply Emergency Treatment Jump Kit Bags for all medically certified responder's to keep in their personal vehicles for off duty emergencies.
- Supply cribbing and air bags for extraction of crash victims trapped inside overturned vehicles.
- Educate the public about the local and regional EMS and trauma care system, detailing what services they provide.

The "**challenge**" of:

- Recruiting, hiring, training and keeping increasingly hard-to-find volunteers.
- Providing training opportunities (closer to home) for EMS personnel.
- Subsidizing initial certification and/or recertification for EMS personnel.
- Keeping skill levels of EMS personnel diversified and current.
- Promoting "Traffic Incident Management" training.
- Promoting public educational and outreach programs; addressing what to do if you are involved in an traffic accident, and/or are passing through an accident scene.
- Developing a process by which regional EMS prehospital agencies, hospitals and other community partners would receive information on available funding resources.

*Emergency Treatment Jump Kit*
***Bags with Defibrillator***

Consider providing the means to hire an experienced grant writer to seek out and apply for available funding to establish a consistent and sustainable financial foundation to address current and future EMS needs and challenges of the corridor.

In order to develop and implement defined strategies that meet these identified needs and challenges, the US 195 Community Based Task Force will need continued involvement and partnerships between the East Region EMS & Trauma Care Council, EMS entities, law enforcement, fire districts, community partners, elected officials, government agencies, WSDOT and the public.

*Cribbing is an essential tool used during vehicle rescue operations to redistribute the weight of objects and provide temporary support*

# Emergency Medical Services

*In 2012, the Eastern Region EMSTC Council approved the use of Basic Life Support - Electrocardiograms for first responders.*

*Many rural EMS systems rely on EMT personnel as the highest level of responding providers. Expanding the use and transmission of 12 lead Electrocardiography (ECG) readings allows pre-hospital communication between the first responders and the physician in charge.*

*First responders transmit pre-hospital ECG data to the Hospital's Emergency Department Physicians, who then determine which resources to activate to immediately begin preparing for the patient's arrival.*

*Source: State of Washington Emergency Medical Services Proposed Clinical Practice; 12 Lead ECG.*

## What are the benefits of having the Eastern Region EMS and Trauma Care Council as an active member of the US 195 Community Based Task Force?

Many East Region Council members are health care experts that routinely commute on US 195. Their familiarity with this stretch of highway makes them ideal candidates to help develop and evaluate EMS focused strategies and countermeasures.

In addition, their expertise and experience can help develop new, unique and well-designed strategies and countermeasures that may not have previously been considered. Their experience can help determine whether or not proposed countermeasures are applicable and viable, based on existing EMS resources and available levels of service. Finally, their first-hand knowledge can also provide insight as to whether previously implemented countermeasures are working in the field, if they are effective, and if emergency medical care and capabilities have actually improved because of their implementation.

Another opportunity to consider under the guidance of the East Region Council is the development of a data collection system, in order to adequately assess response times, communication between response agencies, use of medical dispatch protocols, emergency run information, prioritization of calls (base on severity) and patient outcome information.

As identified by Target Zero the statewide implementation of GPS technology to help track these types of information may prove beneficial in improving the EMS system overall. Armed with this information, the regional EMS system decision makers, East Region EMS and Trauma Care Council and the US 195 Community Based Task Force may be able to help identify shortcomings and develop strategies and countermeasures that improve efficiency of existing operations, as well as pinpoint future resource needs.

## What are First Responders?

As the name implies, a "First Responder" is typically the first EMS provider to an emergency. However, based on the severity or type of incident, first responders may embody many disciplines: law enforcement, fire, emergency medical services, public safety, WSDOT Incident Response, towing and recovery, public works and hazardous materials personnel.

## What is the role of an Emergency Medical Technician?

The role of an Emergency Medical Technician (EMT) is to provide high quality and rapid medical care and emergency response to the injured patient(s). They are trained to evaluate a patient's condition and to perform emergency medical procedures that are needed to maintain a patent's airway with adequate breathing and cardiovascular circulation,

# Emergency Medical Services

until the patient can be transferred to an appropriate destination for advanced medical care. EMTs working the US 195 Corridor are the critical link to making sure that major trauma patients are transported to the highest appropriate trauma care facility available.

Like many professions, EMTs have different levels of responsibilities depending upon their educational background and experience to include: EMT-Basic, EMT-Intermediate and EMT-Paramedic.

## Why are these levels of responsibility important to users of the US 195 Corridor?

Generally, pre-hospital care is dependent on the abilities of the tending EMS personnel. To provide high quality and rapid medical care, respond to emergencies quickly, evaluate and prioritized treatment effectively and transport the patient(s) to the highest level trauma center rapidly. Since first responders are typically the first on the scene, their knowledge and skills are crucial when caring for victims of injury crashess. Armed with advanced training and skills (at the EMT or paramedic level) first responders often can prevent further injury and provide advanced life-saving treatments.

Given the fact that first responder training varies greatly; expanding training opportunities (as identified under the needs and challenges section) is essential in improving the US 195 Corridor EMS system. Providing more opportunities for education and training will improve their life-saving skills. Furthermore, making EMS training available to volunteers may spark an interest in others who may not have previously been involved in EMS, to join this elite group of medical professionals. This in turn may alleviate the dilemma of finding, recruiting, hiring, training, and keeping volunteers (also identified under the needs and challenges section).

## What does the term "Golden Hour" mean and why is it vital?

Emergency medical care experience has shown that for many serious injuries time is critical. The "Golden Hour" of trauma care is a concept that emphasizes the critical importance of the first hour of care. If the time from the incident to the operating room, of a trauma center with an experienced team of appropriately specialized trauma surgeons, is within this critical first hour, the patient's likelihood of survival is greatly increased. Meeting this first hour goal requires a highly efficient and effective EMS system. In general, the time to deliver patients to definitive care consists of six time intervals:

1. Time between crash occurrence and EMS notification,
2. Response time for EMS personnel to be notified and depart from the station,
3. Travel time by EMS personnel to the crash scene,
4. On-scene EMS rescue time,
5. Transport time to a hospital or trauma center, and the
6. Emergency department resuscitation time.

One method being utilized to reduce transportation time to the hospital or trauma center on the corridor is by air ambulance (helicopter). Air transport saves time allowing for specialized care to be received within the "Golden Hour."

## Who are the governing agencies that regulate air medical systems and why are these services essential?

The Washington State Department of Health (WSDOH) regulates the air medical system. Air medical services are a critical component of the statewide EMS and Trauma Care System. They are essential in assuring that patients with life-threatening injuries reach the right facility in the right amount of time. The state air-medical response plan is a component of the State EMS and Trauma Care Plan and provides direction as to which pre-hospital, air-medical services will be delivered in the State. The WSDOH establishes the need for and distribution of air medical services providing care in the pre-hospital setting.

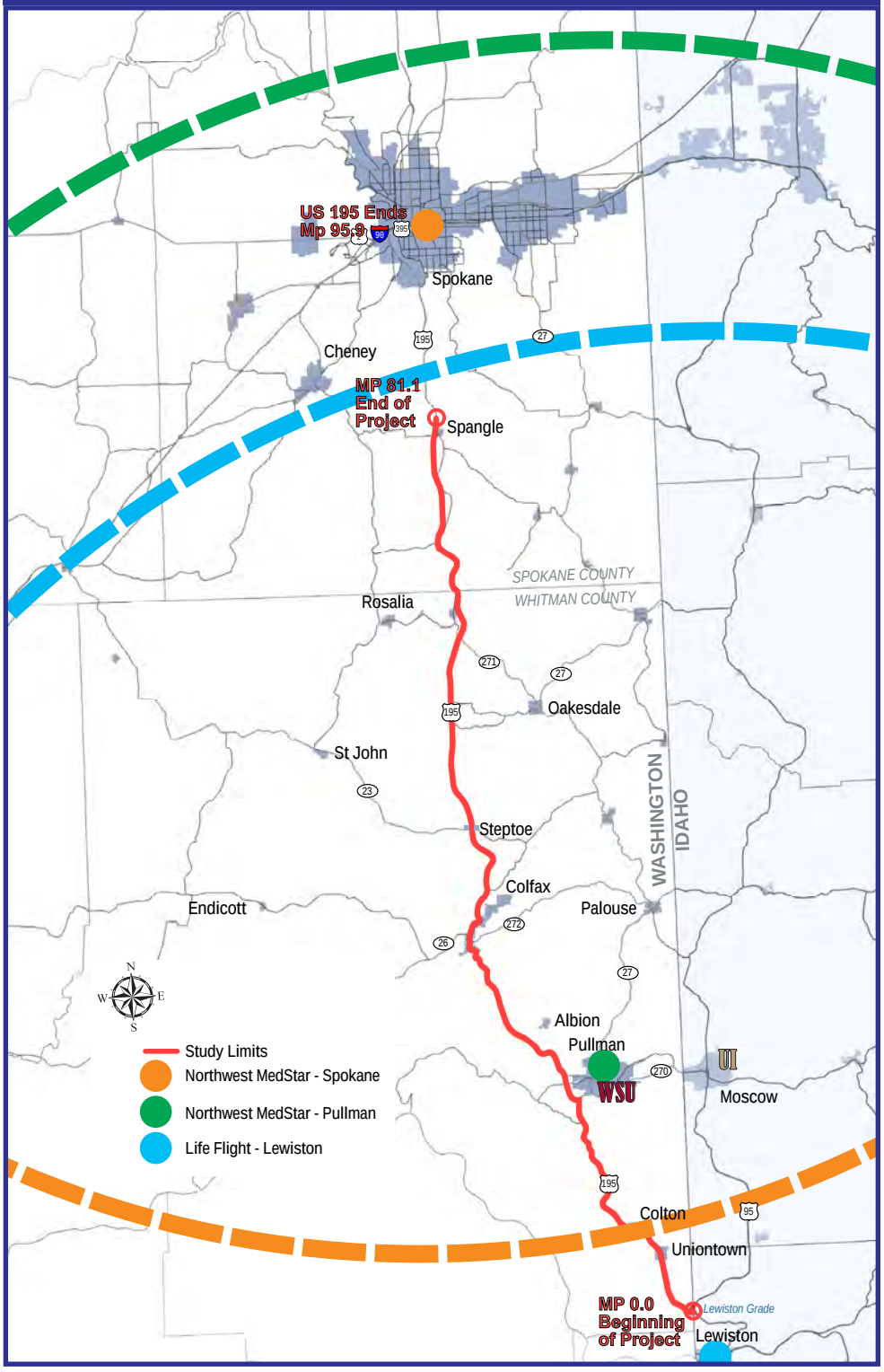
# Emergency Medical Services

## What air medical services are provided within the jurisdiction of the US 195 Corridor?

The air medical system in the State of Washington has four providers of trauma verified pre-hospital air medical services. Together these providers control air ambulance services that are responsible for 30-minute response time from base to EMS scene for 96% of the State's residential population, and 60-minute or less response time for 100% of the State's population.

Within the US 195 Corridor Study limits, there are currently three air ambulance operators which provide 30-minute response time from the flight operation base to the EMS scene, and 30 minute response time from the scene to Level 1 or Level 2 designated trauma facilities. Times are calculated from the time the air medical service receives a request for service and when the helicopter arrives on scene. Air medical services that respond to prehospital EMS and Trauma scenes must arrive within 30 minutes of receiving a request, 80% of the time.

**WSDOH 30 Minute Response Time Coverage - Map**




WSDOH 30 Minute Response Time Coverage - Map — Exhibit EMS - 3.

# Emergency Medical Services

Safety of patient(s), ground EMS and air medical personnel are of primary concern. Therefore, exceptions to this response time are allowed for adverse weather or other factors prohibiting air services from safely flying to or from the EMS scene.

As shown on Exhibit EMS – 3, the three localized air ambulance operators provide overlapping coverage for the corridor. Northwest MedStar operates two helicopters; one based out of Spokane and the other out of Pullman. Life Flight Network has a helicopter based at the Lewiston-Nez Perce County Regional Airport.


*Seconds count when a critically ill or injured patient needs specialized medical attention. Northwest MedStar safely transports patients to the highest level trauma center. They are essential in assuring that patients with life-threatening injuries reach the right facility in the right amount of time.*

**Regional Trauma Facilities within the US 195 Corridor**

| Trauma Designation | | Facility | City |
|---|---|---|---|
| Adult | Pediatric | | |
| II | II P | Providence Sacred Heart Medical Center & Children's Hospital | Spokane |
| III | | Providence Holy Family Hospital | Spokane |
| III | II P | St. Joseph Regional Medical Center | Lewiston |
| III | | Valley Hospital Rockwood Health System | Spokane Valley |
| IV | | Pullman Regional Hospital | Pullman |
| IV | | Tri-State Memorial Hospital | Clarkston |
| V | | Whitman Hospital & Medical Center | Colfax |

The smaller the Trauma Designation number the higher the level of services provides by the facility. The Washington State DOH has authority to designate trauma services. The department designates five levels of acute care trauma services, three levels of pediatric acute care trauma services and three levels of trauma rehabilitation services. Every three years, hospitals can apply and compete for trauma service designation. Based on an assessment of the written application and the results of the clinical on-site survey, the department selects the most qualified applicants.

***Source: Office of Community Health Systems WSDOH Febryary 2013***

**Regional Trauma Facilities within the US 195 Corridor — Exhibit EMS - 4**

## What happens when a trauma incident occurs on the US 195 Corridor?

When a trauma incident occurs on the US 195 Corridor, the person calling 911 is connected to the Whitcom Dispatch Center in Pullman and the Spokane County 911 Dispatch Center. Whitcom is the consolidated 911 dispatch center for the city of Pullman, WSU, Whitman County, Moscow and Asotin County. The dispatcher evaluates the call and determines an appropriate response and action.

It is standard practice to always dispatch both an aid vehicle and an ambulance to the EMS scene. If transport of a patient is not needed the ambulance is canceled. In cases where the dispatcher deems the trauma level to be critical, a helicopter ambulance is put on standby or is launched to the scene based on EMS provider recommendations. The injured are then taken to appropriate trauma facility for care.

# Emergency Medical Services


WSDOH Trauma Zones - Map — Exhibit EMS - 5

## What are the benefits of having a reciprocating agreement between neighboring trauma response areas?

The adjacent map of the DOH Trauma Response Zones - Map Exhibit EMS – 5, outlines the approximate limits for each trauma response area by shape and color with accompanying WSDOH code number. As illustrated, each trauma response area has continuous coverage with no gaps.

These trauma response zones have a reciprocating agreement between neighboring areas, to respond to emergency incidents regardless of boundaries. This mutual understanding allows for a seamless response to trauma events by EMS partnering agencies. Sharing resources enables partnering agencies to:

- Reduce response times for personnel and equipment to treat crash victims,
- Improve the quality of medical care afforded to victims,
- Increase the pool of qualified EMS responders, by drawing from the personnel of the other partnering agencies,
- Eliminate duplication of services,
- Increase provider coordination, which in turn lowers overall costs and makes better use of scarce resources.

The WSDOH Trauma Zones Table Exhibit EMS — 6, defines milepost range, EMS response units, their aid vehicles types and ambulance type. For additional trauma zone information the Washington State Department of Health's web site @ www.doh.wa.gov.

# Emergency Medical Services

| WSDOH Trauma Response Zones - Table | | | | |
|---|---|---|---|---|
| Trauma Codes and Name | MP | EMS Response Unit(s) | Response Aid Vehicle Type | Ambulance Type |
| 3210 Spangle to Rosalia | 81 to 66 | FD#3 Spangle | BLS | ALS |
| 3815 Rosalia to Thornton | 66 to 56 | FD#7 Rosalia | | BLS |
| 3819 Thornton to Cashup | 56 to 50 | FD#7 Rosalia | BLS | BLS |
| 3813 Cashup to DOT Area | 50 to 43 | FD#11 Steptoe | BLS | BLS |
| 3817 DOT Area to Shawnee | 43 to 33 | FD#11/ Colfax Fire Dept. | | BLS |
| 3820 Shawnee to Albion | 33 to 28 | FD#11 Albion | | BLS/ALS |
| 3825 Albion to Johnson | 28 to 14 | FD#12/ Pullman Fire. Dept. | BLS | ALS |
| 3826 Johnson to Idaho Line | 14 to 0 | FD#14 Colton/ Uniontown | | ALS |
| 3827 City of Pullman | City of Pullman | Pullman Fire Dept. | BLS | ALS |

Basic Life Support (BLS) and Advanced Life Support (ALS) are two different levels of medical intervention used for individuals in primarily life-threatening circumstances. Basic life support involves acute medical situations and noninvasive first aide techniques, and is usually a short-term response. Advanced life support, while it can involve relatively short-term response is often a more long-term protocol. Advanced life support also uses more invasive procedures.

BLS = Basic Life Support

ALS = Advanced Life Support

The number coding is for WSDOH use.

***Source: Department of Health***

**WSDOH Trauma Zones - Table — Exhibit EMS - 6**

## Why is radio interoperability significant?

One of the needs that came to the forefront during discussions with the East Region EMS & Trauma Care Council was the need for funding to upgrade the existing radio system to a 700 or 800 MHz interoperable system; where all equipment would be able to seamlessly integrate with other equipment. As an example, all participants' radio systems should be on the same 700 or 800 MHz public safety spectrum and one brand of radio (e.g., Motorola) that has the ability to connect and integrate with other radio brands (e.g., Standard). In addition, any equipment not operating on channels of 12.5 kHz or less will need to be upgraded to this narrowbanding.

Emergency response personnel working the US 195 Corridor require an interoperable communication system that is reliable, secure and operates seamless between users as EMS incidents unfold. Providing this type of communication infrastructure has the potential to improve their ability to effectively manage EMS scenes, prioritize treatment and coordinate the transport of patient(s) to the highest level trauma center.

## Why is the Federal Communications Commission (FCC) requiring a safety radio system change to 12.5 kHz narrowband channels?

The FCC has mandated all non-Federal public safety licensees using 25 kHz radio systems migrate to narrowband 12.5 kHz channels by January 1, 2013. Using narrowband channels will ensure that agencies take advantage of more efficient technology and, by reducing channel width, will allow additional channels to exist within the same spectrum space. Any equipment that is not capable of

# Emergency Medical Services

operating on channels of 12.5 kHz or less will need to be replaced. Prior to this mandate most EMS agencies operating within the US 195 Corridor were using a safety radio system with 25 kHz-wide channels and are now upgrading to a narrowband 12.5 kHz safety radio system.

The purpose of mandatory narrowbanding is to promote more efficient use of the VHF and UHF land mobile bands. Today, these bands are highly congested and there often is not enough spectrums available for licensees to expand their existing systems or implement new systems. As licensees convert to equipment that operates on narrower channel bandwidths, new channels will become available for licensing by parties that need them. It also is hoped that the narrowband conversion will spur the development and use of new technologies that will further promote efficient spectrum use, be less susceptible to interference, and provide licensees with enhanced capabilities.

## Why is Traffic Incident Management addressed in the US 195 Corridor Study?

After a serious traffic crash when lives are at stake, the ability of emergency responders to get to the crash scene to deliver lifesaving help to the injured and get crash victims to the hospital in a timely manner is vital to reducing the number of fatalities, increasing the survivability rate, and potentially lessening the long term effects of injuries, resulting from a crash.

## What are the benefits of Traffic Incident Management training?

One of the challenges mentioned previously was to provide Traffic Incident Management (TIM) training. What is that and why is it important? TIM is a multi-disciplinary incidents response FHWA sponsored program that teaches the importance of properly detecting, verifying and responding to traffic incidents. It emphasizes the importance of protecting responders and motorists when clearing the incident scene and restoring traffic flow. Based on the severity or type of incident, first responders may represent law enforcement, fire, emergency medical services, WSDOT Incident Response, towing and recovery, public works and hazardous materials disciplines. Together these responders use practiced work zone safety procedures, from setting proper signage to getting equipment at the incident scene faster to protect motorists, crash victims and other emergency responders. When an accident occurs

Five measurable objectives of TIM are:

1. Reducing the incident detection and verification time.
2. Reducing response time (the time for response personnel and equipment to arrive at the scene).
3. Exercising proper and safe on-scene management of personnel and equipment, while keeping as many lanes open to traffic as possible.
4. Reducing clearance time (the time required for the incident to be removed from the roadway).
5. Providing timely, accurate information to the public that enables them to make informed choices regarding potential detour options.


***Traffic incidents are the #1 cause of deaths of EMS responders.***
***Maguire B, Hunting K, Smith G, Levick N. [2002]. Occupational fatalities in emergency medical services: a hidden crisis.***

congestion can quickly build up, increasing chances of a secondary incident to occur. The sooner incidents are detected, the sooner safety personnel can respond and clear the road, allowing traffic lanes to re-open and traffic to return to normal conditions faster.

## Are there other opportunities to enhance Traffic Incident Management for the US 195 Corridor?

Public education and outreach programs are an important step towards protecting motorists, crash victims and emergency responders. Motorists need to understand and abide by the law. Regulations require drivers to slow down and move over one lane where possible when passing through an accident scene. Drivers also need to be informed to move their vehicle out of the lanes of traffic to the shoulder, or a safe nearby road if they are involved in an accident and their vehicle is still drivable and there are no injuries at the accident scene.


The FHWA has developed a get the word out campaign about the value of TIM that can be used as a stand-alone message or easily integrated into existing safety campaigns and public service announcements.

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# Safety Rest Areas

*The Horn School Safety Rest Area provides US 195 users the opportunity to get off the highway, sleep, eat, use electronic devices and exercise pets.*


*Uniontown in partnership with WSDOT operates a restroom facility at the city park.*


*The systematic use of roadside turnouts is an important step in keeping drivers alert and awake, making the corridor safer by potentially reducing fatigue related crashes.*

## Why are WSDOT Safety Rest Areas and Roadside Turnouts provided?

Safety Rest Areas (SRAs) serve to improve highway safety; enhance the comfort and convenience of highway travel; and disseminate information to highway users. They provide the traveling public a safe place to stop, rest and take a break from driving.

WSDOT defines a Safety Rest Areas (SRA) as a roadside facility equipped with permanent restrooms, truck and vehicle parking, picnic areas, traveler information, refuse receptacles and illumination. Occasionally other amenities are included such as: potable water, vending machines, Wi-Fi, free coffee, public telephones and pet exercise areas. The WSDOT Design Manual recommends spacing SRAs and roadside parks approximately every 60 miles on the National Highway System and Scenic Byways, such as US 195. WSDOT's Horn School Rest Area is located at MP 60.5 (approximately 60 miles into the corridor, just as the WSDOT Design Manual recommends). There are two additional rest stops along the corridor with restrooms and drinking water at the city parks in Colton, (MP 8.2) and Uniontown, (MP 5.5). There are also several designated roadside turnouts along the corridor, where drivers can stop. Exhibit Safety Rest Areas – 1, shows the locations and amenities provided at these roadside turnouts and safety rest areas.

# Safety Rest Areas

## What Safety Rest Area and Roadside Turnout needs and countermeasures have been identified by US 195 Corridor stakeholders?

During previous stakeholder meetings the following safety rest area and roadside turnout needs and countermeasures were identified.

1. Horn School Safety Rest Area "**needs"**:

- Provide advance signing to alert drivers of the upcoming rest area. Currently, the only advance signing for the Horn School SRA is about a half-mile prior to the exit. Signs could be installed at 1, 5 and 10 miles intervals prior to the rest area to get drivers thinking about stopping.


- Improvements to security — In general, many motorists are reluctant to use rest areas because of concerns for personal safety. Security improvements for this rest area could include: installing security lighting; providing direct telephone access to the law enforcement; providing security cameras; and/or improving lighting and visibility from the highway.

2. Horn School Safety Rest Area "**countermeasures"**:

- Post traffic safety messages and/or campaign material on rest area bulletin boards or at temporary kiosks to educate drivers about safe traffic behaviors that can enhance the safety of all the corridor users. On occasion, traffic safety videos could be shown to influence driver behavior such as: fatigued driving, speeding, aggressive driving, impaired driving, and the importance of proper seat belt usage.
- Provide free Wi-Fi to encourage drivers to stop to and use their electronic devises at the rest area, rather than while driving.
- Expand volunteer services like the "Free Coffee Program" to encourage drivers to stop and take a break from driving. Signs could be installed notifying drivers when services are open to patrons.
- Enhance transmission of safety related real-time information via Intelligent Transportation Systems to drivers. Information could include: weather conditions, traffic congestion, traffic incidents, roadwork, travel times, special events or recommend alternative routes to use to avoid traffic restrictions.

3. Roadside turnouts **"needs and countermeasures"**:

- Provide additional safe roadside turnouts for drowsy and distracted drivers to stop at.
- Provide advance signing to alert drivers of the upcoming roadside turnouts.

# Safety Rest Areas

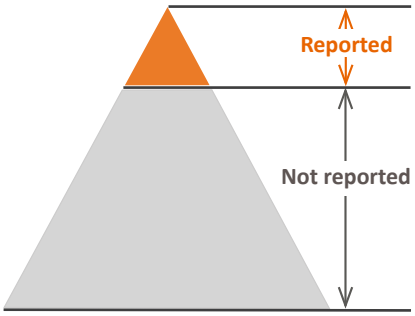
| Existing US 195 Safety Rest Areas and Designated Roadside Turnouts | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Type | Description | Milepost | Info | Rest-rooms | Public Phone | Picnic Area | Drinking Water | Advance Signage |
| Roadside Turnout | Heritage Marker - Rosalia Vicinity | 63.9 SB | Yes | No | No | No | No | Yes |
| Safety Rest Area | Horn School Rest Area | 60.5 SB | Yes | Yes | Yes | Yes | Yes | Yes |
| Roadside Turnout | Pullout Lanes, Portable Weigh Station Cashup Flats | 52.7 SB | No | No | No | No | No | Yes |
| Roadside Turnout | Heritage Marker Steptoe Vicinity | 47.6 NB | Yes | No | No | No | No | Yes |
| Roadside Turnout | Pullout Lanes, Portable Weigh Station Colfax Vicinity | 41.8 NB | No | No | No | No | No | No |
| Roadside Turnout | Wide Shoulder - Pullman Vicinity | 20.5 SB | No | No | No | No | No | No |
| Roadside Turnout | Wide Shoulder - Pullman Vicinity | 20.3 SB | No | No | No | No | No | No |
| City Park | City of Colton | 8.2 NB | Yes | Yes | Yes | Yes | Yes | No |
| Holzer City Park | Uniontown | 5.5 SB | No | Yes | Yes | Yes | Yes | No |
| All rest areas are ADA accessible SB = Southbound NB = Northbound | | | | | | | | |

## What is the correlation between drowsy and distracted driving and safety rest areas/ roadside turnouts?

The systematic use of safety rest areas and roadside turnouts is an important step in keeping drivers alert and awake; making Washington highways safer by potentially reducing fatigue and distracted driving.

Drowsy or distracted driving is dangerous. These behaviors slow reaction time, decrease awareness, impair judgment and increase your risk of a crash. Given that, why is it difficult to attribute crashes to drowsy or distracted driving? Because, crashes statistics capturing these behaviors as attributing factors to a crash aren't easily documented and are often under reported. Law enforcement and other investigators are reluctant to allege driver factors such as drowsiness and distraction as the reason for a crash without explicit statements from drivers or witnesses of the crash.

These factors often lie just "below the surface". Drowsy driving as a contributing factor to crashes is under-reported. Drivers often know that they were drowsy or distracted when a crash happened, but don't always report it to law enforcement. Also, drivers themselves may not always be aware of the effects of these factors on their driving abilities.



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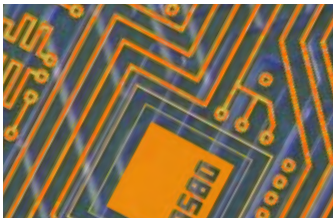
# Intelligent Transportation Systems



***The Spokane Regional Transportation Management Center (SRTMC) is staffed 24/7 to monitor the greater Spokane roadways via traffic detectors and cameras, incident response coordination and providing up-to-the-minute, weather, incidents, construction, and travel time information.***

## What is ITS?

WSDOT describes Intelligent Transportation Systems (ITS) as the visible and invisible technology that runs parallel to many miles of the Washington state highway system. This technology is WSDOT's communication backbone, it provides travel information to commuters, and enhances traveler productivity by improving transportation safety and mobility.

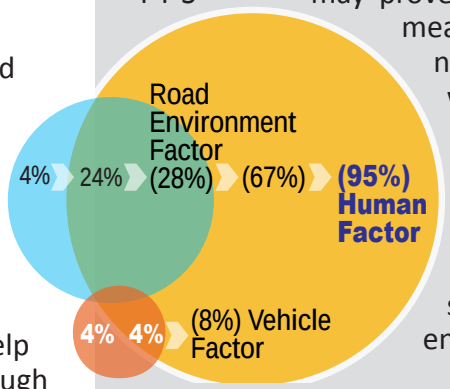
ITS is a broad range of wireless and hard-wired communication based information systems, such as radio, microwave and fiber optics, that help WSDOT manage the roadways through the Spokane Regional Transportation Management Center (SRTMC).

Real-time multi-modal information, including weather conditions, come from many ITS sources that are part of the overall traffic management efforts to:

- Help commuters avoid or manage delays due to congestion, incidents and disasters, work zones, planned special events, and adverse weathers
- Provide information to commuters and transit operators
- Improving on-time reliability for freight movement and highway commuters

## How can Intelligent Transportation Systems change driver behavior within the US 195 corridor?

While reviewing the crash and citation data findings, it became evident that modifying driver behavior is the key to reducing serious injuries and fatalities. Intelligent Transportation Systems allow commuters to receive real-time information about potential hazards and road conditions. This ability to reach drivers through the use of advanced communications, sensors, and information processing technologies can be a powerful force in changing driver behavior. Based on the US 195 Corridor driver demographics, I T S may prove to be an effective counter-measure, as it iprovides advance notification to assist drivers with decision making. When integrated into the transportation system's infrastructure, and into vehicles themselves, ITS technologies can improve safety, minimize delays and enhance individual productivity.




**Ninety five percent of road accidents involve a human factor related to driving behaviors such as distracted driving, driving to fast for conditions, driving tired, etc ... if we can influence these, we can improve driver's behavior. The key to modifying these behaviors is to raise awareness through education and enforcement.**

**Source: New South Wales (NSW) Road and Traffic Authority, 1996**

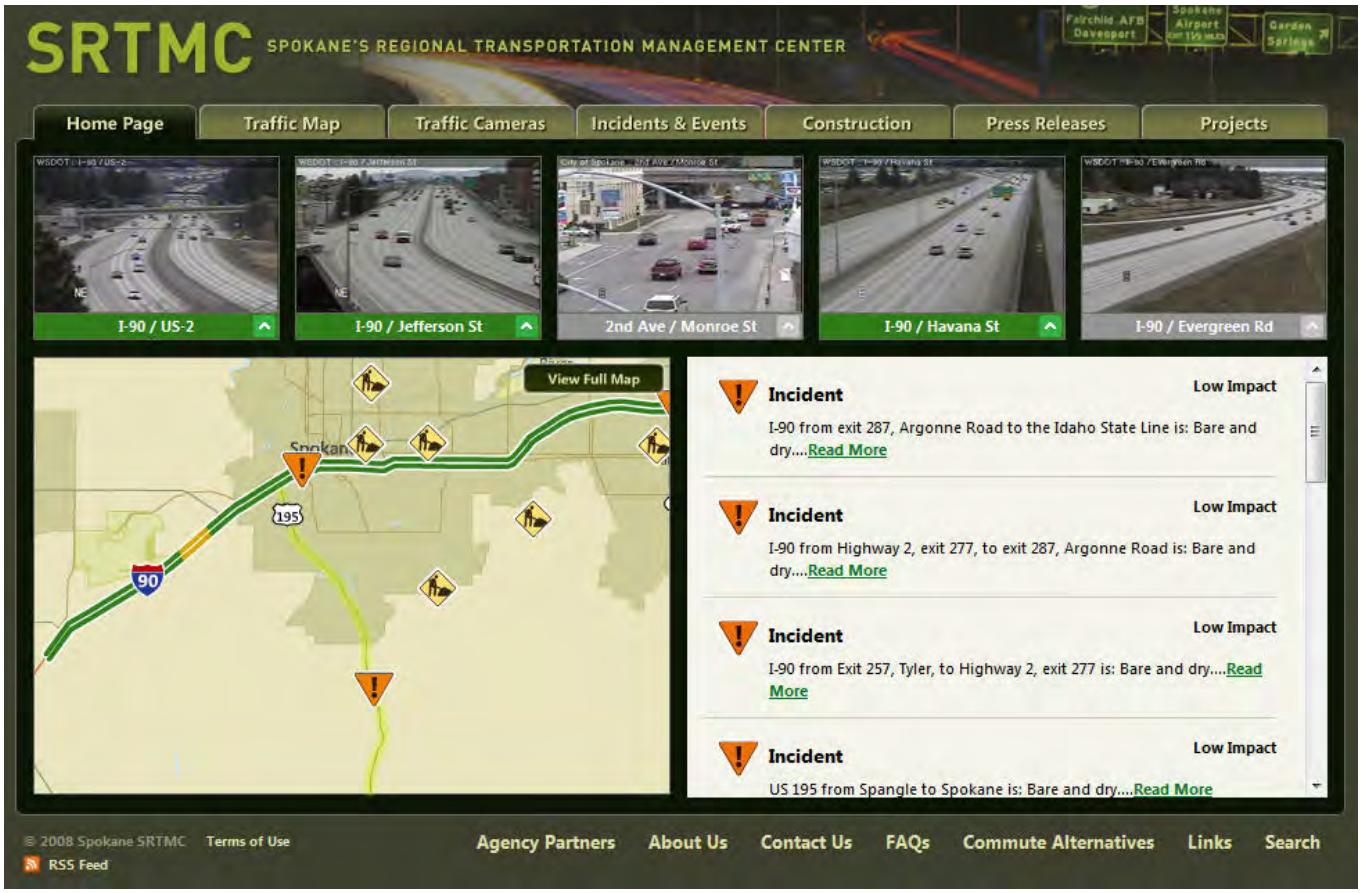
# Intelligent Transportation Systems

## What are the benefits of ITS Technology?

For some time now, the WSDOT has identified the US 195 Corridor as an ITS priority and has made considerable investments in communication technologies. The existing ITS infrastructure includes: traffic cameras, variable message signs, highway advisory radios, roadway weather information systems, traffic data collectors, and the SRTMC interactive website.

The SRTMC is the nerve center of highway monitoring and operations. The SRTMC:

- Monitors traffic and identifies problems using nearly a hundred cameras.
- Utilizes data from traffic detectors, to get a real-time picture of traffic conditions.
- Coordinates response with WSP and other law enforcement and medical emergency response groups when responding to incidents.
- Coordinates activities of WSDOT's incident response teams to help stranded drivers, move disabled vehicles, and keep traffic moving safely while emergency responders help people involved in accidents.
- Provides up-to-the-minute information about what is happening on the roadway and mountain passes, including weather, incidents, construction, and some travel times, to drivers through highway advisory radios systems, variable message signs, the internet, and the 511 traveler information phone system.
- Provides up-to-the-




**The Spokane Regional Transportation Management Center's Website can be found at www.srtmc.org.**

# Intelligent Transportation Systems

minute information to the media.

- Provides various planning data, primarily consisting of traffic counts for estimation of average annual daily traffic. This is typically accomplished with inductive loop detectors and portable road traffic counter tubes.

## What communication based ITS components are used on the US 195 Corridor?

**Road Weather Information Systems (RWIS) —** RWIS stations are installed along the roadway with instruments and equipment which provide weather and road surface condition observations. This information is used to help with decisions on maintenance strategies and to provide information to drivers. These stations may measure air and road surface temperature, barometric pressure, humidity, wind speed and direction, precipitation, visibility and road surface condition (dry, wet, freezing).

**Traffic Data Collectors —** Traffic detectors are one of the key set of tools used to keep track of what is happening on the roadways. The most common detector we use are the induction loop, a simple low-voltage wire coil buried in the roadway that sends an electrical pulse when a vehicle passes over it. Other, less common detectors use infrared, radar, sound, or video imaging to detect vehicles. The detection data is sent from the roadside to the TMC to monitor operations and provide traffic conditions to the WSDOT internet sites, and the WSDOT 511 traffic information hot line.

**Highway Advisory Radios (HAR) —** HARs are licensed low-power AM radio stations installed along the roadway to provide alerts and general information regarding traffic and travel. The presence of a HAR transmitter is marked by a roadway sign instructing motorist to tune to a specific AM frequency.

**Variable Message Signs (VMS) —** A VMS is an electronic traffic sign used on roadways to provide motorist with important information about traffic congestion, incidents, roadwork, travel times, special events or speed limits on a specific highway segment. They may also recommend alternative routes, limit travel speed, warn of duration and location of problem, or simply provide alerts or warnings.

**Traffic Cameras —** WSDOT operates an extensive network of traffic camera across the state to help detect congestion and incidents. The camera images are sent to the WSDOT Eastern Region TMC for operations monitoring to WSDOT internet sites and to local media.


*Variable Message Signs are one of the many ITS technologies used to anticipate and reduce congestion caused by highway work zones.*


*SRTMC shares real-time camera images with the public so that drivers can make informed travel decisions.*

# Intelligent Transportation Systems

***WSDOT has invested in advanced technologies designed to monitor, report and forecast road related weather conditions through the use of Road Weather Information Systems (RWIS).***

## How can we use Road Weather Information Systems to enhance the US 195 Corridor?

The Road Weather Information System (RWIS) is a network of meteorological and pavement sensors located along the highway system. RWIS stations are positioned at strategic locations to provide accurate real-time road weather information and critical observations for forecasts. RWIS stations may include some or all the following information:

- Weather data; including air temperature, amount and type of precipitation, visibility, dew point, relative humidity, atmospheric pressure, and wind speed and direction;
- Surface data; including pavement temperature, subsurface temperature, surface condition (dry, wet, frozen), amount of deicing chemical on the roadway, and freezing point of the road surface.
- Traffic cameras that take images of the roadway for snow and ice control as well as for traveler information.

## What are the benefits of Road Weather Information Systems?

The data collected and disseminated:

- Improves timeliness of maintenance actions by providing information to assist with roadway maintenance management decisions. This allows for timely dispatch of snow plows or de-icing operations.
- Provide data to SRTMC to be disseminated to media, HARs, 511, etc. to inform the traveling public.
- Enhances traveler information to assist motorists in making informed decisions for safe and efficient travel during severe weather events.
- Facilitates information sharing with other stakeholders, such as county road departments and municipalities, and others – This allows decision makers to make timely and informed choices.
- Integrates with other ITS field devices, such as cameras and message signs, at the RWIS locations. Providing real-time information to additional ITS devices better informs the entire corridor of weather conditions or events.

## What are the opportunities for RWIS technology in the US 195 Corridor?

Currently RWIS stations are installed at:

- US 195 & Heitstuman Road, at MP 3.7 (south of Uniontown).
- US 195 & Cornwall Road, at MP 81.1 (north of Spangle).

Crash density maps show weather related accidents near those locations. Both locations are where drivers go through elevation changes that can affect the road surface in icy or snowy conditions.

As mentioned, it is desirable to place RWIS stations at locations with weather problems for incident detection. However, Road Weather Information

# Intelligent Transportation Systems

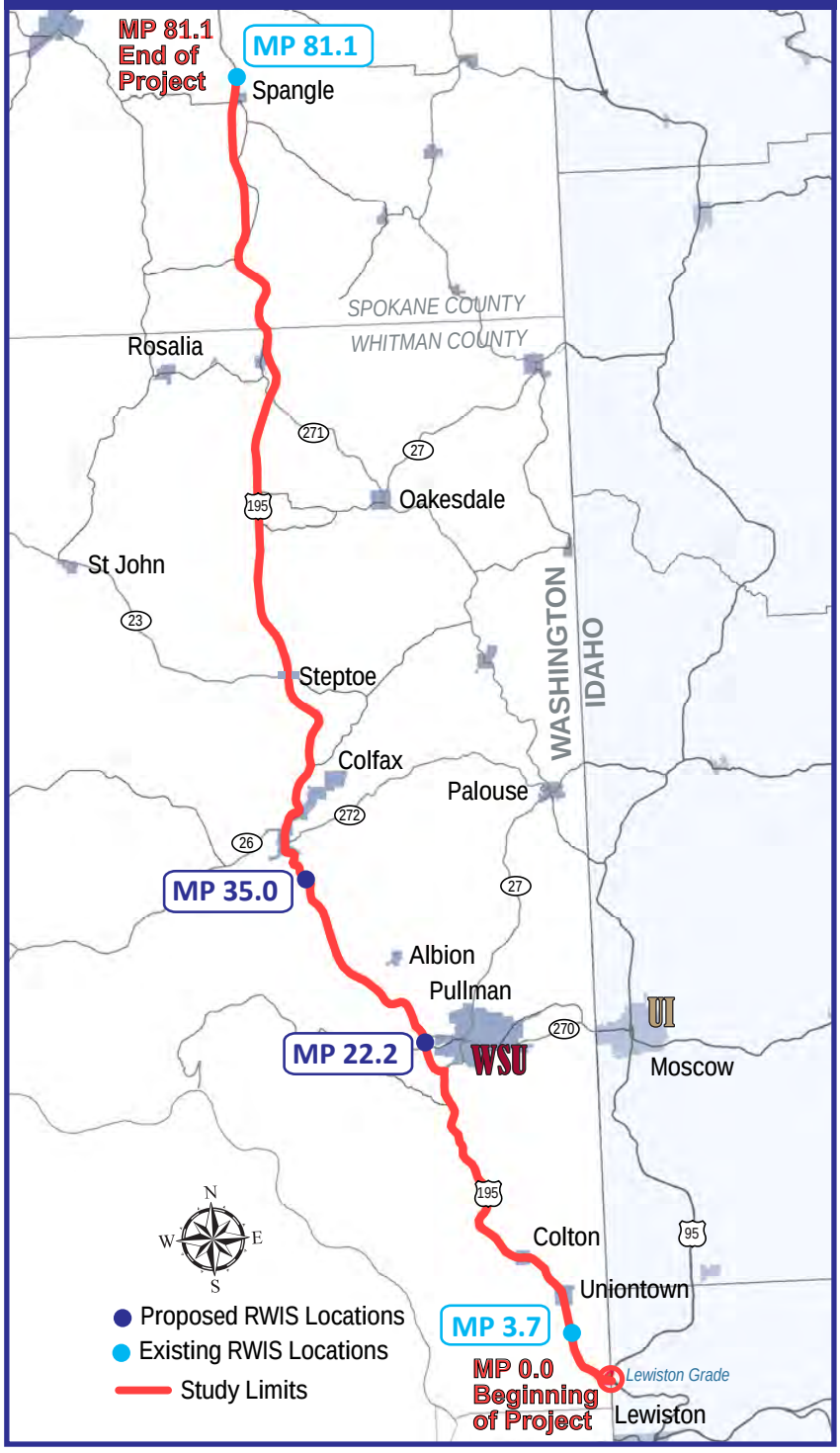
Systems are also used to monitor regional weather and pavement surface conditions. They can also be used as a tool to improve local prediction models, that utilize regional weather forecasts from a system of several connected RWIS stations spread across a region. To establish such a system along the US 195 Corridor, the gap between Spangle and Uniontown would need to closed by adding RWIS stations at:

- US 195 & SR 270 ramps at MP 22.2 (north of Pullman).
- US 195 & Parvin Road, at MP 35.0 (south of Colfax)

Another viable reason to place stations near Pullman and Colfax is that these locations are near the highest population centers, for the corridor, with the greatest concentration of traffic, making them prone to frequent accidents during adverse weather conditions. Especially near Pullman, where 60% of the population is students, and due to their age, many are relatively inexperienced at driving during adverse weather conditions.

See Existing and Proposed Road Weather Information Systems Locations — Exhibit ITS - 1.

**Existing and Proposed Road Weather Information Systems Locations**




**Existing and Proposed Road Weather Information Systems Locations — Exhibit ITS - 1**

# Intelligent Transportation Systems

## How can ITS improve safety for the US 195 motoring public?

ITS can improve transportation safety for visitors, commuters, local residents and haulers, by reducing weather-related traffic incidents. To achieve this, ITS weather and traffic information, retrieved from key locations can be disseminated to the public to keep them informed of real-time traffic, weather and road conditions. Having this information gives the motoring public options when making their travel plans. This is why the Spokane International Airport (SIA), in partnership with the efforts of the US 195 Corridor Crash Analysis Study, SRTMC, Spokane Transit Authority (STA) and local car rental agencies are actively pursuing ways to monitor and inform the travelling public of traffic and weather conditions on US 195, particularly during winter weather conditions. Currently, SIA is implementing smartphone technologies and installing variable message signs at airport egress locations, in an effort to keep travelers informed.

## Who should be consulted when considering RWIS locations?

In considering a location for a RWIS station, the following users should be considered:

- WSDOT's Maintenance & Operations (M&O) personnel who use RWIS information to make winter maintenance decisions, such as snow plowing and deicing applications.
- The travelling public who use the information to make informed travel decisions.
- The National Weather Service who use the observations to improve local forecasting and weather warnings.
- The Federal Aviation Administration's Web Camera program and other agencies benefit from RWIS sites.
- Data is sent to WSP where decisions regarding the appropriate response to an incident or event are made.

Once a new site is selected, it is reviewed in coordination with the region-wide RWIS deployment plans. Other considered factors are cost and the availability of power and communication. Sites that do not have direct power require a power generator, while sites that do not have nearby telephone or WSDOT network service require a wireless communication solution. Other factors include topography, the natural environment around the site that can affect sensor readings, and the availability of WSDOT right-of-way. It is recommended that an experienced meteorologist be consulted in the selection of an RWIS site.

## When utilizing weather information to make decisions about winter maintenance operations, what are the benefit-costs?

Preliminary estimates show 7:1 benetit-cost return overall. However, further verification will be necessary to confirm these results. To include:

- More weather information research,
- A review of extensive winter weather data,
- Surveys with winter maintenance professionals and,
- The development of a model representing winter maintenance costs.

Upon completion, the research results should help WSDOT guide and direct future investments in ITS weather information services and technologies.

# Intelligent Transportation Systems

## What is a portable RWIS (Mobile Weather System)?

One of the newest available RWIS technology, introduced in 2012 by the Vaisala Corporation, is a portable RWIS system that can be equipped on a vehicle and provides several hi-tech weather monitoring sensors including:

- A sensor that uses a laser pointed at the road surface, to measure if the road is dry, wet, or icy. The laser sensor can also determine how much water or ice is on the surface, and how slippery is the pavement.


***Example of a mobile weather system equipped on a vehicle.***

***Photo by the Vaisala Corporation.***

- An infrared sensor that monitors the temperature of the pavement. In most cases, the temperature of the pavement is very different than the temperature of the air, and road surface temperature determines the freezing and thawing of water.

- A sensor, that monitors the air temperature and amount of moisture in the air.

All of these readings aid road maintenance decision makers in determining what actions (if any) needs to be taken to ensure the road remains safe for travelers Once the data is collected, it is stored on-board the vehicle in a small computer and is displayed on a smart phone application visible to the driver (the computer creates a wireless network in the vehicle). The data can be viewed by the driver or transmitted through the smart phone back to a central location for others to view.

While stationary RWIS stations are still needed to provide 24/7 information and recorded history data, the mobile station can collect real-time road conditions and weather throughout the corridor. The mobile weather station can be used on cars as well as pickups trucks.

The cost for a stationary RWIS is approximately $50,000 plus maintenance. The cost for a mobile weather station ranges from $14,000 to $20,000 depending on how it is equipped.

# Intelligent Transportation Systems

## WSDOT Description of Roadway Treatment Actions

### Treatment *Level 1* Goals

1. Pre-treat roadway with anti-icing chemicals as conditions* allow.
2. Apply deicing chemicals to roadway during a snow event to keep snow from accumulating and bonding to the pavement and to ease the process of mechanical removal.
3. If compact snow or black ice forms on the roadway, apply pre-wet solid chemicals to break the snow/ice bond and to assist the process of mechanical removal. Apply abrasive materials alone or in combination with deicers to maintain traction when necessary. Monitor conditions continually and apply resources as needed to return the pavement to bare and wet condition as soon as practical

### Treatment *Level 2* Goals

1. Maintain the same as Level 1 roadways to the extent that resources allow.
2. Apply continuous treatment and monitoring as resources are available.
3. Prioritize resources to Level 2 roadways as soon as Level 1 roadway treatment goals are met. Return pavement to bare and wet condition as soon as practical.

### Treatment *Level 3* Goals

1. Pre-treat with anti-icing chemicals as conditions* and resources allow.
2. If snow accumulates, plow with or without the moderate use of pre-wet sand or salt.
3. Treat accumulated snow and/or ice with the moderate use of pre-wet sand or salt. Return pavement to bare and wet condition as soon as Level 1 and Level 2 roadway treatment goals are met

### Treatment *Level 4* Goals

1. Limited pre-treatment of anti-icing chemicals for snow, black ice, frost or freezing rain as conditions allow.
2. If snow accumulates, plow with the limited use of pre-wet and/or solid deicing chemicals.
3. Treat existing amounts of compact snow and ice by plowing with the limited use of pre-wet and/or solid deicing chemicals.

### Treatment *Level 5* Goals

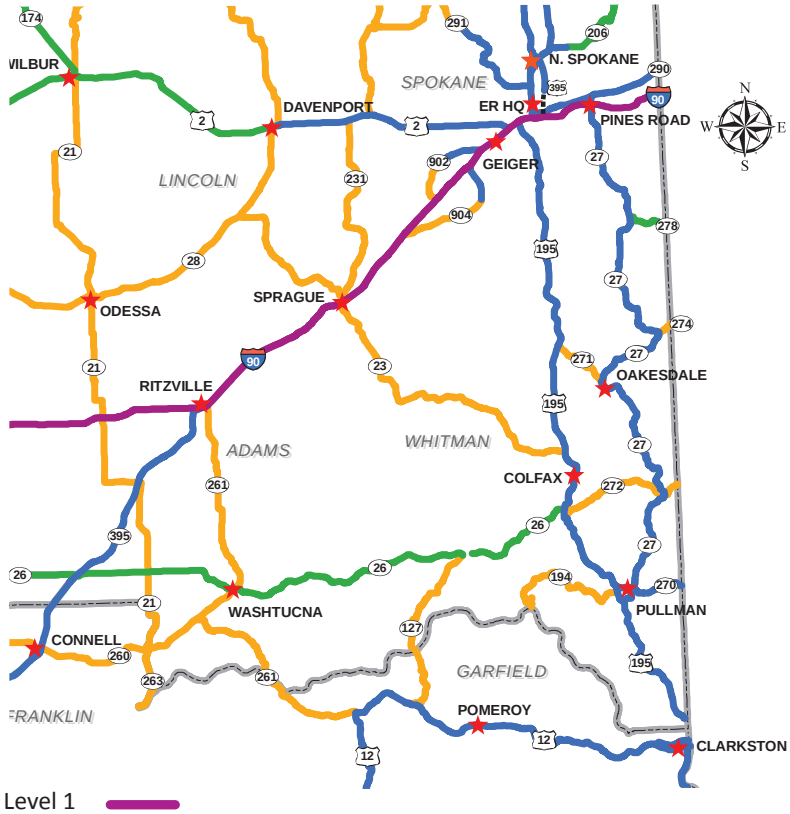
1. Treat like level 4 roads while open.
2. Road will remain passable as conditions allow.
3. Roads closed when condition dictate.

* Wet condition do not lend themselves to anti-icer pre-treatments due to material dilution.

## How are RWIS used as part of the WSDOT's Statewide Snow & Ice Plan?

During winter months, the WSDOT Snow & Ice Program and Roadway Treatment Goals (under the umbrella of the Statewide Snow & Ice Plan) play an important role in keeping highways drivable and traffic moving, to facilitate the delivery of goods and services with the utilization of RWIS to track weather conditions. The purpose of the plans is to provide guidance and direction on efficient, effective and consistent operations of snow and ice control.

The Roadway Treatment Goals shown on the chart and map are delineated by color. Each color represents different roadway recommended treatment levels necessary to maintain snow and ice control uniformity regardless of region or maintenance area boundaries.




Eastern Washington Snow and Ice Plan
Roadway Treatment Goals

**WSDOT Roadway Treatment Goals — Exhibit ITS - 2.**

# Intelligent Transportation Systems

## When developing and evaluating ITS focused countermeasures, how can WSDOT Operations and Maintenance contribute to the success of this process?

Thanks to the efforts of WSDOT Operations and Maintenance, and the implementation of the "Strategic Snow & Ice Program" (management of snow and ice control), winter roadway conditions continue to improve. However, with better winter roadway conditions there has been an unforeseen corresponding increase in risky driver behaviors, such as driving too fast for conditions, tailgating and improper passing of snow plows. This is counter-productive to WSDOT's Target Zero goal to reduce fatalities and serious crashes to zero. These types of safety challenges face WSDOT and the Community Based Task Force when developing countermeasures, and will require on-going partnerships between WSDOT Operations and Maintenance, Engineering, Highway Safety experts, law enforcement agencies, educational institutions and the traveling public through direct communication.

WSDOT Maintenance will be instrumental when developing and evaluating ITS focused strategies and countermeasures. Their expertise, experience, and familiarity with this stretch of US 195 are invaluable, and aid in determining whether proposed countermeasures are applicable and viable. This insight will guide implementation, particularly in regards to existing maintenance levels of service and available resources. Maintenance's first-hand knowledge will also directly inform performance evaluations of implemented ITS countermeasures.

With these objectives in mind, innovative solutions and countermeasures will be targeted to improve the efficiency and effectiveness of snow and ice-control, by WSDOT Operations and Maintenance, as well as ways to better inform motorists of wintertime driving conditions. Some advanced ITS technologies currently used or under consideration include:

- Winter maintenance decision support systems such as the continued use of snow plows equipped with GPS trackers to provide real-time data as to how much snow has been removed, which routes have already been plowed and de-iced and most importantly which haven't.
- Winter maintenance equipment with enhanced sensors and control devices that measure and communicating winter roadway conditions,
- Higher-resolution winter weather forecasting tools and computer models to predict how the weather is likely to evolve over the course of hours or days,
- Improved ways of alerting motorists to wintertime driving conditions and educating them of the potential dangers of driving during winter weather.

Note: these specific ITS applications and technologies will require research, testing and pilot studies before they could be deployed.

Integrating these advanced ITS technologies with other aspects of Transportation Operations and Maintenance along the US 195 Corridor is the first step into the future; where existing transportation infrastructures will be linked with communication networks, in an effort to improve safety, ease congestion and reduce travel time.

# Intelligent Transportation Systems

## How can Highway Advisory Radio upgrades enhance the US 195 Corridor?

Surveys have shown that Variable Message Signs (VMS), commercial radio, and low power Highway Advisory Radio [HAR]) are the most prevalent forms of ITS technology used to disseminate information. HAR signs and systems are generally positioned at decision points where a choice can be made by the driver or in high volume areas where timely messages can be received.


***Highway Advisory Radio transmitters provides the traveling public real-time travel information via their AM radio.***

Commercial radio, both AM and FM are a ongoing source for weather, events and other information to drivers. HAR is used when there are upcoming concerns in the corridor. When the HAR sign flashes it is a notice to drivers that there is a radio message to tune in. HAR systems have limited range via AM radio channels. Their licensed design range is 1.8 miles. Reception of the HAR signal is a function of terrain, weather conditions, and the strength of receiving vehicle's radio.

The Highway Advisory Radio is a tool that can be used by local and state transportation agencies across the nation to give the traveling public real-time travel information via their AM radios. HAR operates as a Travelers Information Station and is licensed by the Federal Communications Commission (FCC). HAR can provide warnings, advisories, and directions, or other non-commercial material of importance to the traveling public.

HAR messages are transmitted from low-power roadside transmitters. The messages are typically less than a minute. Drivers approaching a HAR site are advised of its existence by advance highway signs, which tell the traveler where to set the tuning dial to receive the message.

The location of an HAR transmitter is restricted by FCC Rules and Regulations to the immediate vicinity of air, train, and bus transportation terminals, public parks and historical sites, bridges, tunnels, and any intersection of a Federal Interstate Highway with any other Interstate, Federal, State, or local highway.

HAR messages are generally recorded for continuous repetition. The message length is adjusted to typically permit the driver to receive the messages at least twice while passing through the stations' coverage zone, as required by the Highway Advisory Radio Message Development Guide- Report No. FHWA/RD-82/059.

The message origination point for HARs is the SRTMC. The following are potential reasons to activate HAR messages:

- Maintenance and construction zones,
- Traffic advisories (e.g., accidents, delays, lane blockages),
- Route diversions,
- Special events (including parking control),
- Weather advisory warnings, and
- Tourist information (e.g., food, gas, and lodging).

The current HAR locations within the US 195 Corridor study area at:

1. MP 19.3 & MP 23.5 (in the vicinity of Pullman).
2. MP 60.6 & MP 66.2 (in the vicinity of Rosalia).

# Intelligent Transportation Systems

## What are the opportunities for HAR messaging on US 195?

Highway Advisory Radio messages typically include.

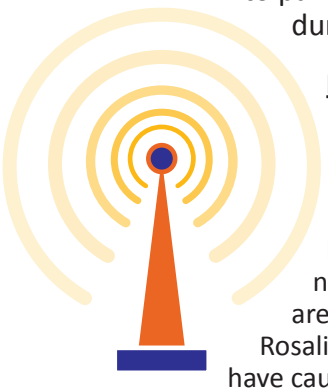
**Weather Advisory:** Provides information regarding weather conditions.

**Detour Advisory:** Provides information to help navigate major road construction sites or offers alternate routes.

**Traveler Information:** Provides reminders to drivers to:

- Drive safely during adverse weather conditions.
- Pack winter survival provisions in the vehicle if driving during adverse weather conditions.
- Be prepared for possible delays and road closures due to adverse winter weather conditions.

**Special Event Advisory:** During special events, particularly those associated with the universities, such as game days, Moms' and Dads' Weekends, traffic advisory regarding travel time and/or diversion podcasts via the HAR system may prove beneficial. Along with directing traffic to shuttle bus parking areas rather than wasting time driving to parking areas closed or already full during special events.

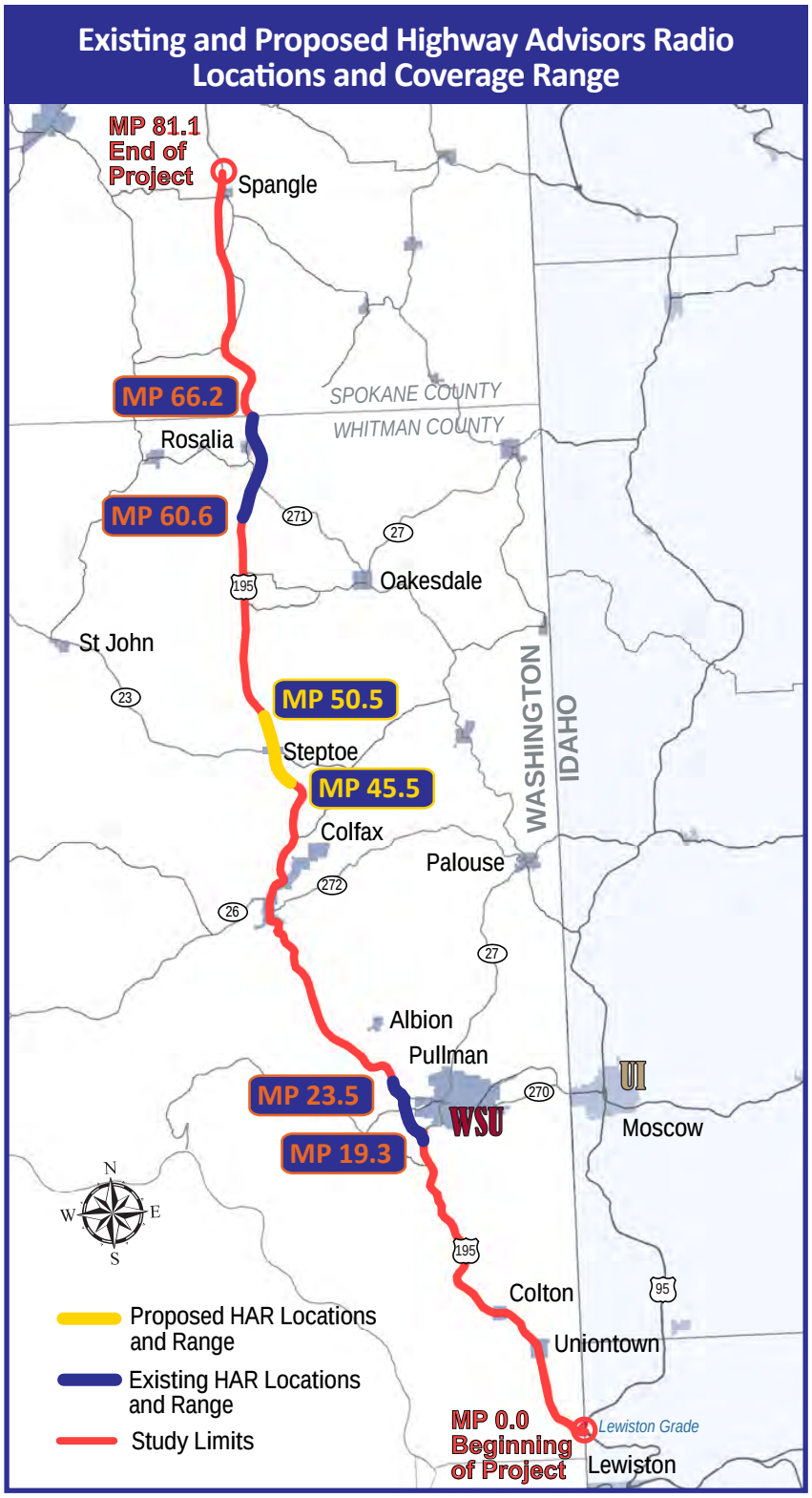


**Example message of a roadway closure due to drifting snow:** Attention! This is the Washington State Department of Transportation Highway Advisory Radio Station (****); US 195 northbound and southbound lanes are closed to through traffic between Rosalia and Colfax; snow and high winds have caused drifting snow with limited visibility. Southbound traffic headed to Pullman must take alternate route, SR 27. Traffic must exit at SR 271 south of Rosalia. At Oakesdale take SR 27 and continue south towards Palouse. Alternate route signs will guide you to Pullman and points south. We regret any inconvenience. Thank you.

**Example message of special event parking:** Attention football fans headed for the Washington State University stadium. This is the Washington State Department of Transportation Highway Information Radio Station (*****) special announcement. Parking near the stadium is limited due to construction work. It is advisable to park either at the ****parking lot or the north campus parking lot. From these locations a shuttle bus to WSU Stadium runs every 15 minutes, until 30 minutes prior to game time. Bus fare is one dollar per person and parking is free. We regret any inconvenience. You can save time and money by using these parking lots and taking the shuttle bus. Thank you.


An assessment of the existing HAR systems on the US 195 Corridor determined it would be beneficial to install an additional system at the US 195 & SR 23 Interchange, at MP 48.0. This decision point could provide travelers with another source for accurate real-time information, helping them make better decisions about when to travel, what mode to use and what route to take during a route diversion. In addition, it may be desirable to provide a HAR message near the US 195/SR 23 interchange to direct travelers to Steptoe Butte State Park, a local tourism destination, where travelers can get out of their cars and stretch (relieve fatigue) as they take in the panoramic views of surrounding farmlands and the Blue Mountains or have a picnic. Rest room facilities are available. See Existing and Proposed Highway Advisors Radio Locations and Coverage Range — Exhibit ITS -3.

# Intelligent Transportation Systems




Existing and Proposed Highway Advisors Radio Locations and Coverage Range — Exhibit ITS - 3

## How can Variable Message Signs enhance the US 195 Corridor?

Variable message signs (VMS) are located along highways to provide messages that inform commuters of important information. The messages can be changed to provide real-time information. VMS signs convey information about roadway conditions, alternate routes, construction activities, or any information that will assist motorists in making decisions. It is typical to provide a series of signs within a region or corridor to lessen traffic impacts and improve traffic flow. Areas with low power may use solar power to supplement or completely run the sign.

Variable Message signs are not solutions in themselves; they require an information source such as Road Weather Information System, Closed Circuit Television (CCTV), Environmental Sensing Stations (ESS), or any kind of Roadside Detection (RS-D) in order to be effective.

## What is the approximate cost for a variable message sign?

See Cost Estimate for Variable Message Sign Types — Exhibit ITS - 4 it provides the approximate costs for variable message sign equipment, based on the Research and Innovation Technology Administration (RITA) and the Eastern Region (ER) Traffic Office.

# Intelligent Transportation Systems

Capital costs vary. Less for a smaller VMS installed along arterial and more for a full matrix, LED, 3-line, walk-in VMS installed along a freeway. These costs do not include installation. The VMS tower costs include a low capital cost associated with a cantilever structure and more for a truss structure that spans across 3-4 lanes. The portable VMS sign includes a trailer mounted VMS and may include trailer, solar or diesel power.

| Cost Estimate for Variable Message Sign Types | | |
|---|---|---|
| **Variable Message Sign Types** | **Capital Cost** | **Annual Operating Cost** |
| Variable Message Sign – Stationary | $47K to 117K (RITA) | $2.4K to 6K |
| Variable Message Sign – Portable | $18K to 25K (RITA) | $1.2K to 2K |
| Variable Message Sign – Stationary | $144K to 200K (ER) | $1.8K to 3K |

**Estimated costs for variable message sign equipment based on the Research and Innovation Technology Administration (RITA) and the Eastern Region (ER) Traffic Office.**


***A VMS is an electronic traffic sign used on roadways to provide motorist with important information about traffic congestion, incidents, roadwork, travel times, special events or speed limits on a specific highway segment. They may also recommend alternative routes, limit travel speed, warn of duration and location of a problem or simply provide alerts or warnings.***

## Where should future Variable Message Signs be located?

Currently there are no permanent VMS located along this section of US 195. However, temporary mobile variable message signs are occasionally placed to provide alerts or warnings for short durations, for special events, adverse weather, construction and hazards.

VMS signs are recommended at:

- Egress locations (on W Airport Drive) for the Spokane International Airport,
- US 195 Northbound, MP 0.0 (at the Washington/Idaho State line),
- US 195 Northbound, MP 34.3 (south of Colfax),
- US 195 Southbound, MP 21.5 (at Pullman),
- US 195 Southbound, MP 40.5 (at down grade section leading into Colfax),
- US 195 Northbound MP 60.4 (south of Horn School Rest),
- US 195 Southbound, MP 80.2.

See Proposed Variable Message Sign Locations — Exhibit ITS - 5.

# Intelligent Transportation Systems


Proposed Variable Message Sign Locations — Exhibit ITS - 5

## How can video traffic cameras enhance the US 195 Corridor?

Traffic video cameras are an important component in the ability to manage traffic. Using cameras, our Transportation Management Center staff monitors traffic continually looking for accidents or other incidents. When a problem arises, WSDOT can immediately verify the incident via the cameras and report it to emergency response personnel, WSP, area media and local WSDOT maintenance crews. Drivers can then be alerted via variable message signs, highway advisory radio warnings, and in the future through smartphone technologies.

During constantly changing conditions the use of traffic video cameras help ensure messages stay accurate and timely.

Surveys of traveler information services have routinely noted that weather information, provided through text or camera images, are the most frequently requested types of information.

Currently there are two traffic cameras on the RWIS sites along the US 195 Corridor.

- The first is at MP 3.7, on Al Heistuman Road near Uniontown and
- The second is at MP 81.1, on Cornwall Road north of Spangle. These cameras refresh every 15 minutes.

# Intelligent Transportation Systems

There is an independent camera in the City of Colfax at:

- MP 38.48, the image refreshes every 2 minutes.

As part of this study, SRTMC staff evaluated data from a wide range of sources to determine key locations for placement of future video cameras. The preferred locations should be at sites that:

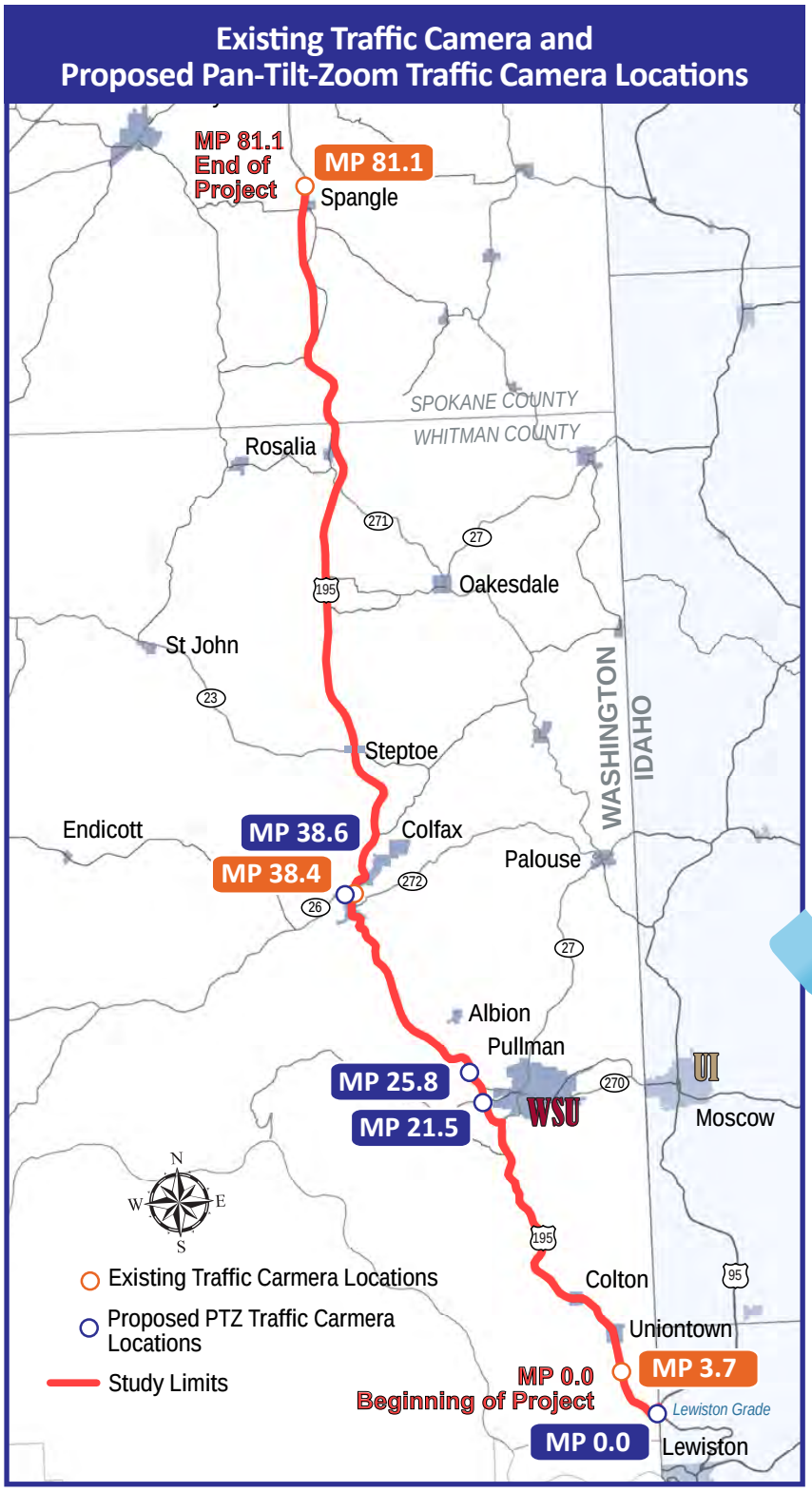
- Show existing roadway weather conditions,
- Have a higher number of crashes, vehicles sliding off the road and/or blocking incidents, during adverse weather condition,
- Enable viewers to see a significant portion of roadway,
- Allow viewers to see key intersections,
- Allow WSDOT to find roadway incidents visually.

Another item brought out during the evaluation process was the preference for Pan-Tilt-Zoom (PTZ) Traffic Cameras. PTZ cameras have the ability to horizontally scan 360 degrees, tilt up and down, and zoom, which allows operators to see for nearly a mile. With these capabilities in mind, the following locations were identified for future PTZ Traffic Cameras.

- US 195, at MP 25.8, (near Pullman).
- US 195, at MP 21.5, (just south of the SR 194 interchange at

***WSDOT operates an extensive network of traffic camera across the state to help detect congestion and incidents. The camera images are sent to the TMC for operations monitoring and then on to the Web for travelers and to the media. Cameras are often mounted on RWIS towers.***

# Intelligent Transportation Systems




Existing Traffic Camera and Proposed Pan-Tilt-Zoom Traffic Camera Locations — Exhibit ITS - 5

## How do we get the word out about ITS?

Don't take chances. Winter driving can be ugly. Check the Spokane Regional Transportation Management Center (SRTMC) website at: www.srtmc.org, before hitting the roads each day to check that your route is safe and clear, or if there isn't a better route to take. Websites such as these are valuable in getting the word out about current ITS information and resources available to drivers of the US 195 corridor and need to be actively promoted. That is why an awareness campaign would be beneficial in getting the word out about the corridor's existing and evolving computer and communication technologies, and how this information can improve traffic conditions, minimize delays and increase safety for commuters.

# Intelligent Transportation Systems

## In summary, what are the ITS recommendations for this section of US 195?

For future projects within the limits of the study and available funding recommendations include:

**RWIS** — The following locations were identified for future Road Weather Information Systems:

- US 195 & SR 270 ramps at MP 22.2 (north of Pullman).
- US 195 & Parvin Road, at MP 35.0 (south of Colfax).

**Mobile RWIS** —

- Provide one unit, approximate cost $14,000 to $20,000.

**Maintenance & Operations** — Some advanced ITS technologies to investigate include:

- Winter maintenance equipment with enhanced sensors and control devices that, measure and communicate winter road conditions,
- Higher-resolution winter weather forecasting tools,
- Winter maintenance decision support systems,
- Snow plows equipped with GPS trackers to provide real-time data, such as how much snow has been removed, which routes have already been plowed and de-iced and most importantly, which haven't.
- Improved ways of alerting motorists to wintertime driving conditions and educating them on the potential dangers of driving during winter weather.

**HAR** — The following location was identified for a future Highway Advisor Radio System:

- The US 195 & SR 23 Interchange, near Steptoe, MP 48.0.

**VMS** — The following locations were identified for future Variable Message Signs:

- US 195 Northbound, MP 0.0 (at the Washington/Idaho State line),
- US 195 Southbound, MP 21.5 (at Pullman),
- US 195 Northbound, MP 34.3 (south of Colfax),
- US 195 Southbound, MP 40.5 (at down grade section leading into Colfax),
- US 195 Northbound MP 60.4 (south of Horn School Rest),
- US 195 Southbound, MP 80.2,
- Spokane International Airport (SIA) egress locations (on West Airport Drive). *Although SIA is outside of the project limits, SIA is pursuing funding to place variable message signs at the exit points in alignment with the US 195 Corridor Crash Analysis Study efforts (Spring 2013). They plan to explore partnerships with the SRTMC, Spokane Transit Authority (STA) and local car rental agencies to monitor and inform the travelling public of traffic and weather conditions on highways such as US 195.*

**Traffic Camera** — The following locations were identified for future PTZ Traffic Cameras.

- US 195, at MP 25.8, (near Pullman).
- US 195, at MP 21.5, (just south of the SR 194 interchange at Pullman).
- US 195 & SR 26, at MP 38.6 (west of Colfax). This location was specifically identified by WSP as strategic location point, and
- US 195, at MP 0.0, the Washington/Idaho State line. This location was also identified by WSP as strategic location point.

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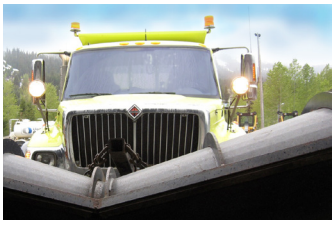


# Adverse Weather

***Drifting snow piled up during the record winter of 2010.***

## Why is drifting snow a concern?

Few residents living south of Pullman will be able to forget the snowdrifts that piled up during the record winter of 2010. US 195 south of Pullman closed due to a whiteout aggravated by drifting snow. The Washington State Patrol (WSP) and WSDOT Maintenance crews worked hard to keep vehicles moving. However, the significant drifting trapped snow plows, WSP officers, and approximately 20 private vehicles for over ten hours, before reinforcements arrived and cleared the highway.

While the winter of 2010 was extreme, many snow drifting events occur in the same places year after year, generating costs for snow removal and costs associated with delays to freight and private vehicles.

In this chapter we will explore countermeasures that have the potential to mitigate the impacts of drifting snow.

## What is the historical cost of closing the US 195 Corridor, due to snow events?

The Spokane Regional Transportation Management Center (SRTMC) monitors and records significant snow related traffic events for the Eastern Region.

**SRTMC — Snow Related Closures**

| Date | Hours. | Time of Closure | Depth | Type |
|---|---|---|---|---|
| 3/29/2009 | 3* | 8:15 a.m. Closure | | Snow/ Blowing/ Drifting |
| 2/1/2009 | 3* | 10:40 a.m. Closure | 12” | Whiteout |
| 1/5/2009 | 3* | 1:05 a.m. Closure | 10" | Zero Visibility |
| 1/1 & 2/2009 | 14 | 12:30 p.m. Closure | 15" | Snow/ Drifting |
| 3/27/2008 | 3* | 6:20 a.m. Closure | 2" | Snow/ Drifting |
| 2/7/2008 | 3* | 11:00 a.m. Closure | 12" | Zero Visibility |
| 2/5/2008 | 3* | 10:53 p.m. Closure | 14" | Drifts/Poor Visibility |
| 2/1/2008 | 3* | 7:20 a.m. Closure | 12" | Snow/ Drifting |
| 1/30/2008 | 7 | 9:00 a.m. Closure | 8"-16" | Snow/ Drifting |
| 1/29/2008 | 3* | 6:55 p.m. Closure | 8" | Drifts and Low Visibility |
| 1/15 & 16/2008 | 8 | 10:30 p.m. Closure | 2" | Snow/ Drifting |
| 12/29 & 30/2007 | 12+ | Time Unknown | 8" | Drifting/ Visibility |
| 12/9 & 10/2007 | 2 | Time Unknown | 3" | Semi Slide |
| 1/4/2007 | 5 | Time Unknown | 5"-6" | Ice |

Hours with an asterisk are approximated by WSDOT Maintenance. Table summarizes closures from 2005 to 2009 for the section of the US 195 between MP 0.0 - MP 23.0

**SRTMC — Snow Related Closures**

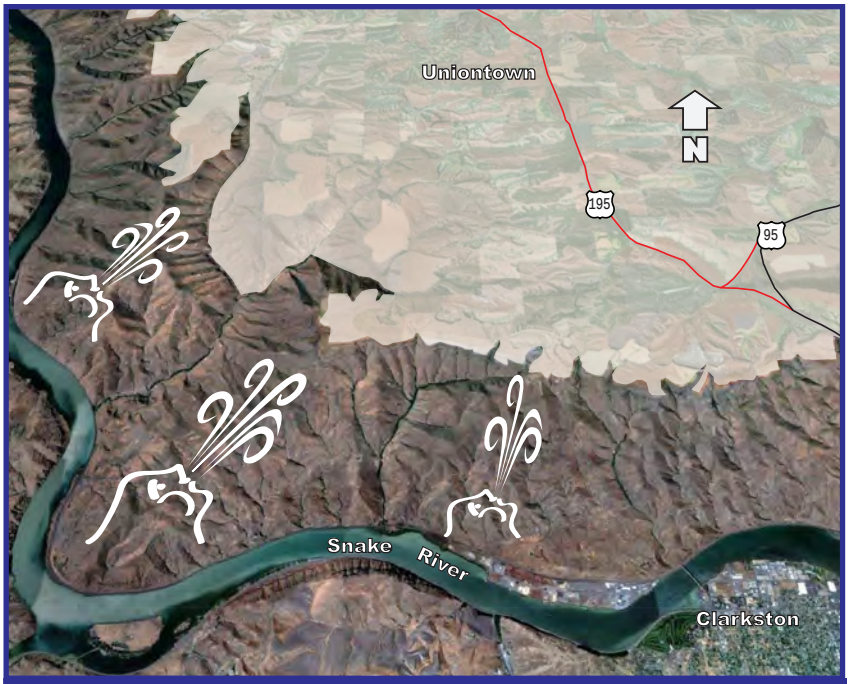
This corridor experienced 72 hours of snow related closures between 1/2007 - 3/2007. WSDOT estimates it costs approximately $4800 per hour in lost wages, when freight and private vehicles are

# Adverse Weather

stopped due to drifting snow. If you do the math, it cost approximately $345,000 for the five year period from 2005 to 2009.
($4800 x 72 hours = $345,000).

When asked about driving concerns on the US 195 corridor as part of the public survey, the participants identified snow and ice conditions as a concern.

A Midwest Transportation Consortium study concluded that driving during extreme winter weather, such as low visibility and/or blowing snow, increases the risk of crashes by 20 to 30 times compared to driving during clear and dry conditions.




***The graphic highlights how the winds generated by the Snake River effect the surrounding terrain***

***South of Pullman to the Washington/ Idaho state line, prevailing winds from the southwest carry snow across the open farmland, resulting in significant drifting snow which eventually can cause roadway closures.***

## What does the evaluation of a project benefit to cost ratio involve?

A benefit to cost ratio:

- Calculates the benefit to cost ratio of the proposed countermeasure. Such as snow fences, vortex generators, and side slope flattening,
- Identifies project specific impacts and associated monetary values: property damage only, possible injury, evident injury, serious injury, and fatalities,
- Determining the present value benefits of a proposed countermeasure or project, by estimating the anticipated savings from the number of crashes that will be reduced due to implementing a given countermeasure.

## What are some potential countermeasures that could mitigate snow drifting?

During the winter months, WSDOT maintenance crews work around the clock to keep the US 195 corridor drivable and traffic moving. However, periodically severe winter storms create large snow drifts that close the corridor generally at the same locations year after year. While the WSDOT cannot keep snow from drifting, there are available measures to influence the way the wind carries and deposits snow along the roadway such as; snow fences, vortex generators, and side slope flattening, WSDOT has used slope flattening as a drifting snow countermeasure in the past at a select number of locations along the corridor. Later in this chapter Exhibit Adverse Weather

Conditions  shows proposed slope flattening locations.

## What are snow fences and are they viable countermeasures for drifting snow?

There are two types of snow fences, temporary and permanent.  The three types of temporary snow fences that are being consider for use are as countermeasures to drifting snow Include:

1. Perforated orange plastic mesh sheeting attached to stakes at regular intervals and
2. Lightweight wood strips and wire fencing attached to metal stakes and
3. Four-by-eight-foot straw bales placed end to end to create a fence.

According to WSDOT Maintenance, hay bales require significant resources to haul, place, and remove after the winter season. The bales are also susceptible to decay and rodent infestation.

WSDOT Eastern Region Maintenance expressed concerns regarding the use of straw bales as a countermeasure.

Farmers and ranchers use temporary snow fences to divert large drifts into basin areas to create a spring water supply.  This same principle can be utilized to divert snow away from US 195.  A Palouse farmer asked the study team to consider installing hay bales snow fences as a possible sustainable countermeasure.  Acknowledging the concerns presented by WSDOT maintenance, there may be an opportunity to collaborate with the farmer develop some type of snow fence application that works for both parties.

***Temporary perforated orange plastic mesh snow fence.***

***Four-by-eight-foot straw bales placed end to end to create a snow fence.***

A permanent snow fence generally consists of posts set in the ground with horizontal planking.

Permanent snow fencing is typically installed at roadway locations that are subject to predictable snow and wind patterns year after year.

# Adverse Weather

*Permanent snow fences stop drifting snow from piling up on the highway. Placing a snow fence requires an understanding of snow drifting patterns, snow density, terrain, snow storage capacity, meteorology data, fence setback and drainage requirements.*

*Living snow fence planted adjacent to SR 25, about 14 miles north of Davenport, in 2003.*

## What are living snow fences?

Living snow fences are rows of closely spaced shrubs or conifer trees planted along the road. Living snow fences serve as a vegetative barrier that traps and prevents blowing and drifting snow from piling up on the highway.

One of the first living snow fences in the state was planted adjacent to SR 25, about 14 miles north of Davenport, in Lincoln County. WSDOT maintenance identified SR 25 as having a reoccurring problems with drifting snow, often times accumulating to three-foot drifts on the highway. A living snow fence was recommended as a countermeasure and planted in 2003. The fence is 800 feet long and consists of about 500 Rocky Mountain junipers, staggered in two rows. Over the past several years the living fence has flourished and the majority of trees are now six to seven feet tall. Eastern Region maintenance confirmed that this living snow fence prevented snow from drifting onto SR 25, even during two severe winters.

The success of the SR 25 snow fence project prompted WSDOT to install a living snow fence adjacent to US 2 between Reardan and Davenport in 2007. Currently, the trees are not mature enough to verify the performance of the fence, however positive results are anticipated.

# Adverse Weather

## Why make a case for installing living snow fences within the US 195 Corridor?

Properly designed and placed living snow fences help in several different ways. They keep drivers from being stranded, improve visibility, reduce crash potential, reduce the cost of snow plowing, allow relocation of snow plows to other areas, and help reduce shipping delays for goods and services.

While the cost to plow snow widely varies, an estimated cost of $3.00 to $5.00 per ton is typical. In comparison, according to the Federal Highway Administration the cost to store snow using a snow fence is approximately 3 cents ($0.03) per ton. In addition, AASHTO's Highway Safety Manual Crash Modification Factors indicates crashes are predicted to be reduces by 8% to 11% following the installation of a snow fence.

Additional documented benefits are:

- "A living snow fence is more efficient in capturing snow than a slatted fence. When mature, a living snow fence, depending on its design, may capture up to 12 times more snow than a slatted fence and can be designed to conserve energy for farmsteads, rural buildings, livestock and community facilities." ***USDA National Agroforestry Center.***
- "By contracting 40 percent of sites with snow problems to the Living Snow Fences program, Minnesota DOT could save $1.3 million per year. Living snow fences improve driver visibility and road surface conditions, and have the potential to reduce accidents, snow removal costs and removal of equipment emissions." ***Minnesota DOT***.

"Benefit to cost ratios for permanent snow fences, based only on reduced costs for snow removal range from 10 to 35:1, depending on the quantity of blowing snow." ***National Research Council.***

"The life of a living snow fence is estimated at 40-50 years, while that of a slatted snow fence is 7-20 years, which means that over a 50-year span, the installation and maintenance costs of a slatted snow fence could be 4-7 times greater than a living snow fence." ***USDA National Agroforestry Center.***

"Wyoming DOT reports that with the installation of snow fences along Interstate 80, snow removal costs dropped up to 50 percent and the accident rate during snowy, windy conditions fell by up to 70 percent. Center of Environmental Excellence by ***AASHTO***.

"Many DOTs use wooden slat fencing in areas with large open areas and fences are expensive to purchase, install and maintain. The maintenance of snow fences was estimated to be $3 per mile per year, compared to $185 per mile per year for a 4 foot slat fence ***(USDA, 1994)." University of Minnesota, 2002 Dollars.***

"An evaluation of 18 sites in Minnesota found that reduced snow removal costs alone in an average snowfall year (32 inches) would generate benefit/cost ratios ranging from 9:1 to 46:1" ***Minnesota DOT.***

Based on these testimonials, pursuing opportunities to fund some form of snow fence mitigation may prove feasible.

***Living snow fences effectively trap drifting and blowing snow from entering roadways. They act similarly to rocks in a stream, creating an eddy effect that alters wind speed and direction, causing snow to settle where it is directed.***

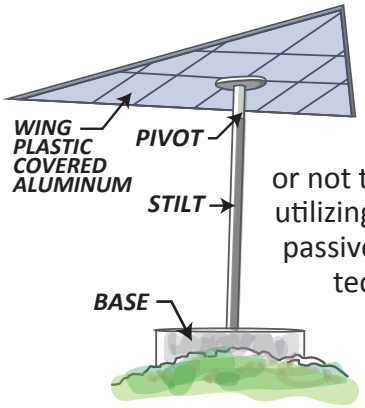
# Adverse Weather

## Are there other innovative low-cost countermeasures that deal with drifting snow?

In 1999 WSDOT's North Central Region started testing and evaluating the use of vortex generators, as a possible passive snow and sand displacement and removal method.

Plastic-covered aluminum "vortex generator" frames, made at minimal expense by students at Cascade High School in Leavenworth, were placed by WSDOT on tall stilts located next to the highway. Pivoting in the wind, the wing redirects the natural airflow to clear the highway of snow or sand.

WSDOT had two test sections, one along SR 172, in the vicinity of Mansfield for drifting snow and another near Vantage, along SR 243 for drifting sand.




TThe goal of these two test sections was to determine whether or not the vortex generators, utilizing an innovative low-cost passive snow-manipulation technique, would be able to remove drifting snow off the highway. The preliminary test results confirm that the vortex generators are functioning successfully. However, more evaluations are still needed to verify the performance reliability of the vortex generators, to substantiate the costs savings and to track wind patterns, before the placement of any additional vortex generators.

## What are the advantages of vortex generator?

In 2002, The North Central Region noted before-and-after costs of installation and found that for an annual period, overtime and equipment costs for snow and sand clearance on the SR 243 stretch of highway, were reduced from approximately

***Pivoting in the wind, vortex generators redirect the natural airflow to clear the highway of snow on State Route 172, near Mansfield.***

$6400 to about $250. In addition, safety was improved. The vortex generators operate whenever the winds are significant enough to cause the sand or snow to drift, eliminating the wait time and need for a plow.

## What are the disadvantages of vortex generator?

Vortex generators require a substantial concrete base of 1500 pounds to withstand the potential forces from high winds. This makes them hard to reposition when needing to capture the full benefit of the prevailing winds. In addition, if the wings move too much back and forth or side to side, with the wind, they are not as effective at redirecting snow or sand. If the vortex generators are installed within the highway clear zone, they need to be made crash worthy with breakaway features or protected by guardrail. The guardrail has a tendency to interfere with the wind flow over the wing, diminishing its effectiveness in moving snow.

## How does slope flattening work?

Slopes flattening is another countermeasure that can address blowing and drifting snow. When roadway back slopes are flattened, blowing

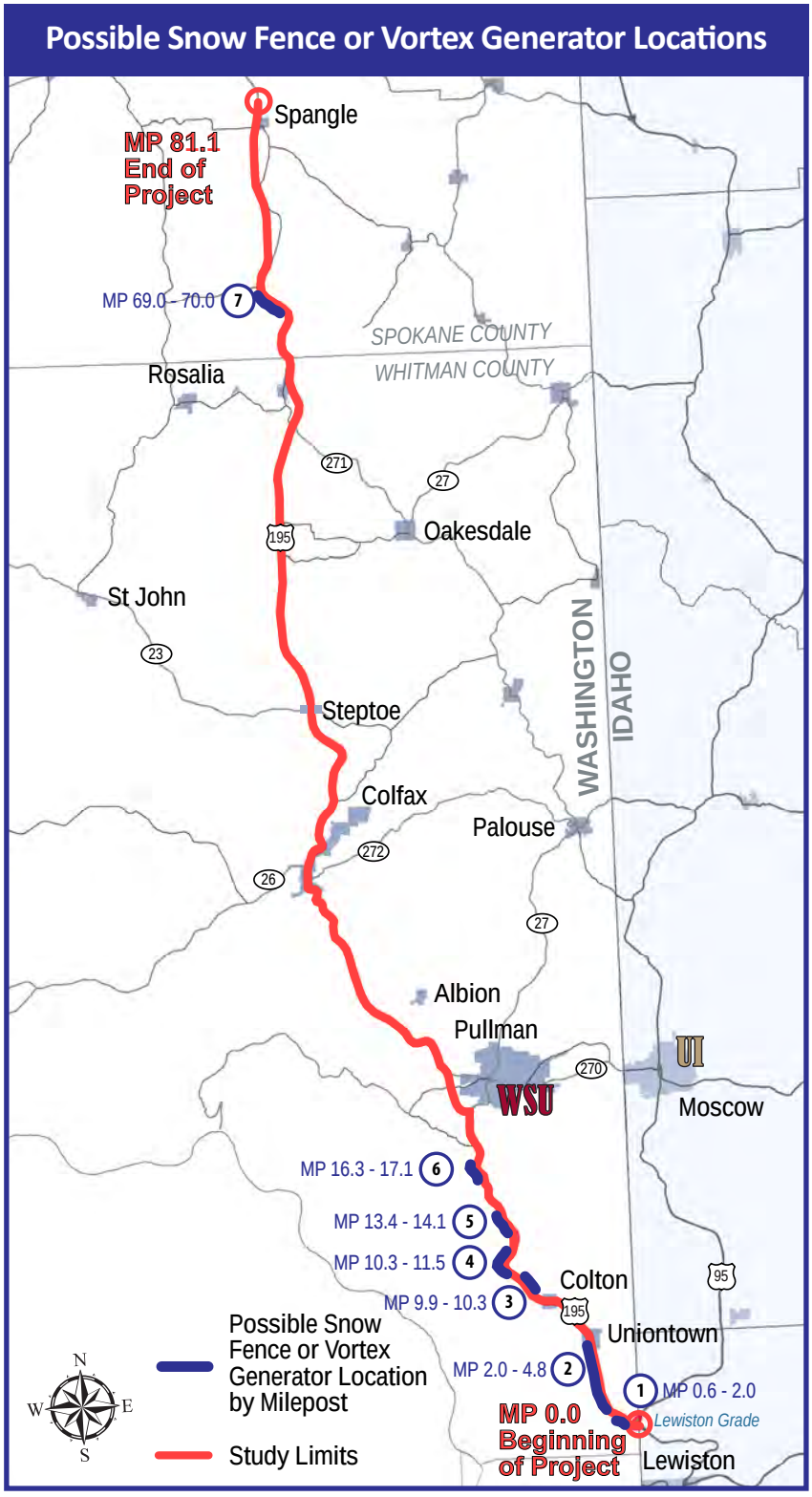
snow is able to cross the roadway rather than drift and settle on it. Apparently most drifts begin in pockets behind existing roadway foreslopes. Where slopes are steep, they can be flatten to permanently address drifting snow. WSDOT maintenance crews have had great success with this countermeasure on the SR 27 Corridor.

The benefit costs associated with slope flattening vary based on the amount of required excavation and the willingness of adjacent owners to allow WSDOT to remove excavation material from their property.

## Where would installation of snow fences or Vortex generators be beneficial?

Based on past snow events on the corridor, the following locations should be considered for snow fence and/or vortex generator installation:

1. MP 0.6 to MP 2.0, Schultheis Rd. This section experiences the severest drifting on the corridor, requiring a plow truck to cycle back and forth on the two mile stretch to keep roadway open. This area is prone to closures, snow typically blows to the west and accumulates on the roadway.
2. MP 2.0 to MP 4.8, Schultheis Rd. There is severe drifting on this section, snow typically blows to the west and accumulates on the roadway.
3. MP 9.9 to MP 10.3 Addressing snow accumulation on this section has been




Possible Snow Fence or Vortex Generator Locations

# Adverse Weather

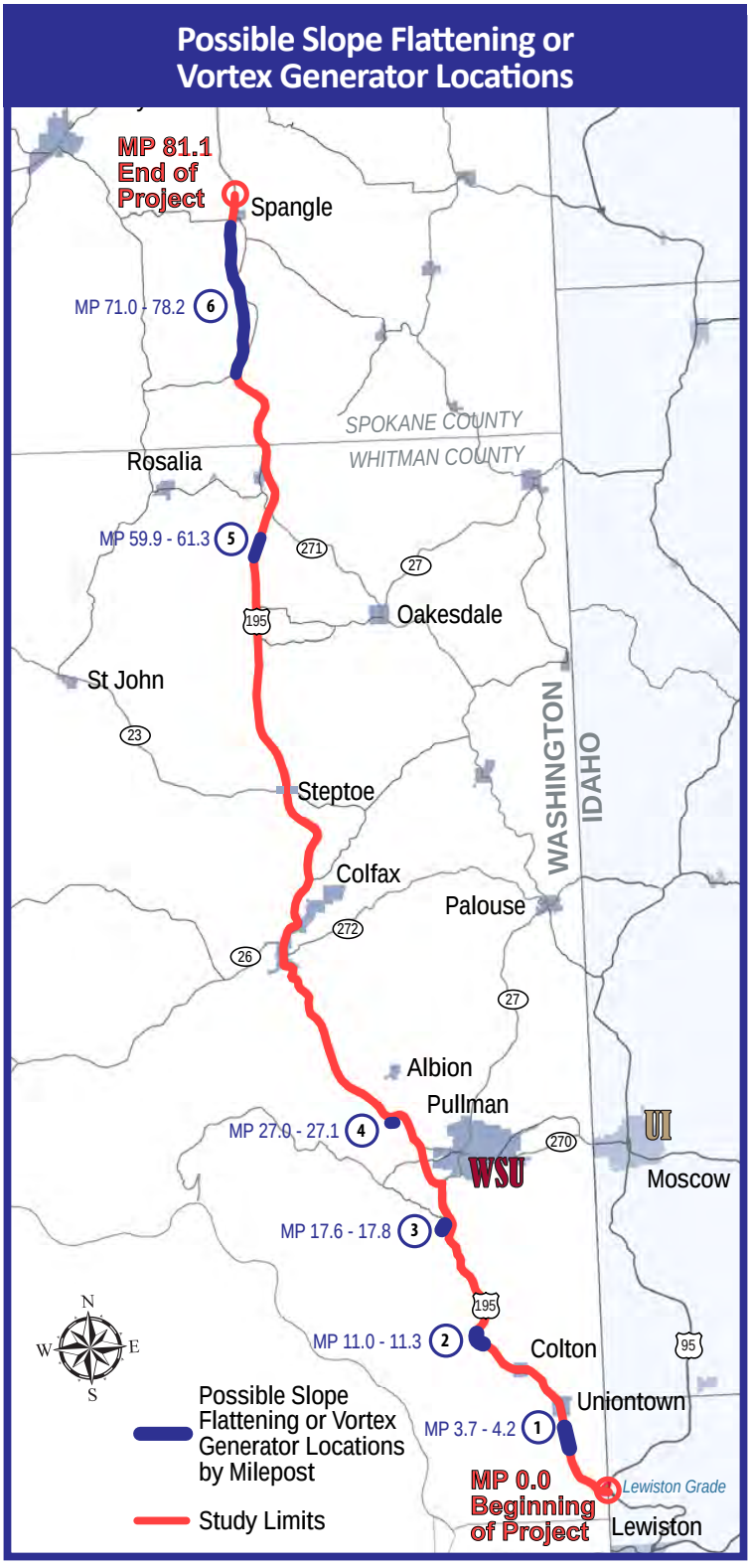
challenging due to limited maintenance resources. When plow trucks are sent to clear other sections of US 195, drifts accumulate on this segment. Typically this section experiences severe drifting on the east side of US 195 east side of the US 195 roadway.

4. MP 10.3 to MP 11.5
   A temporary berm that was constructed at the quarry site has slightly mitigated drifting in this section. Severe drifting occurs on the west side of the roadway. There are times when this section is closed to traffic.
5. MP 13.4 to MP 14.1, Johnson Rd.
   This section experiences snow drifting on the west side of the roadway and obstructs local approaches.
6. MP 16.3 to MP 17.1
   This section experiences drifting on the west side of the roadway.
7. MP 69.0 to MP 70.0
   This section experiences drifting on the west side of the roadway.

## Where should slope flattening or Vortex generators be considered along the US 195 Corridor?

Based on past snow events on the corridor, the following locations should be considered for slope flattening and/or vortex generator installation:

1. MP 3.7 – 4.2
2. MP 11.0 – 11.3
3. MP 17.6 – 17.8
   This section experiences drifting on the west side of roadway
4. MP 27.0 – 27.1
   This section experiences drifting on the west side of roadway
5. MP 59.9 – 61.3
6. MP 71.0 – 78




**Possible Slope Flattening or Vortex Generator Locations — Exhibit Adverse Weather Conditions**

# Adverse Weather

## Is climate change predicted to affect the US 195 Corridor?

The incorporation of climate change impacts into transportation decisions is still a relatively new concept. As decision makers in various areas wrestle with information on climate change effects, and how they may or may not impact their core mission(s), they are turning to existing tools and approaches for guidance. The Federal Highway Administration (FHWA) and the WSDOT recognize the potential for climate impacts.

Currently FHWA recommends that transportation agencies take a two-pronged approach to considering the potential impacts of extreme weather events and climate change. FHWA Recommends transportation agencies:

1. Conduct a vulnerability assessment of the transportation systems affected by extreme weather events and climate impacts.

2. Integrate the vulnerability assessment into decision making by incorporating it into asset management, long-term planning, and project prioritization. WSDOT has successfully applied FHWA's recommended approach.

In November 2011, WSDOT prepared a report for submittal to the FHWA "Climate Impacts Vulnerability Assessment". WSDOT did not supply the science for this study. WSDOT relied on the results of a 2009 study commissioned by the Washington State Legislature and completed by the University of Washington's Climate Impacts Group, entitled "The Washington Climate Change Impacts Assessment." The purpose was to forecast climate changes and their effects within the greater Columbia River watershed, which includes Washington State. This information is being used as the basis for all state agency analyses.

The potential climate impacts along the US 195 Corridor were evaluated as part of WSDOT's climate risk assessment performed in 2011 by the region, assisted by WSDOT Headquarter Environmental and Design offices. US 195 is predicted to experience wind and rain erosion, some flash flooding, closures due to winds causing snow drifting, and flooding. The corridor has a moderate vulnerability ranking according to WSDOT's 2011 assessment.

Over the last few years significant snow weather events have blanketed US 195 and surrounding areas. These recent climate events are a concern regarding highway closures in the southern areas of Whitman County and surrounding communities. The Whitman County Emergency Management Natural Hazards Mitigation Plan and the WSU Crisis Communications Plan Washington State University – Pullman University Relations and Office of Emergency Management are two known established plans that address natural disasters in the Palouse vicinity.

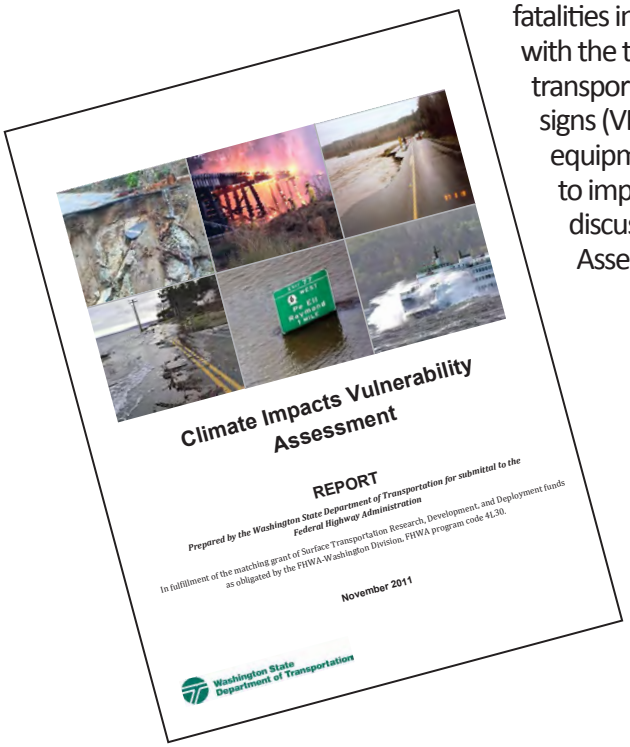
*Drifting snow on the roadway can cause severe traffic hazards.*

## Are there countermeasures that can address the impacts of climate change on the US 195 Corridor?

There is opportunity to address the consequences of climate change in the corridor, in particular to potential flooding and wind events that causes drifting snow and dust. In this case, snow fences are an example of a potential countermeasure. The need to be vigilant in the areas of Emergency Medical Systems, Engineering, Education and Enforcement

# Adverse Weather

is important to address climate change. Even though emergency plans are in place, there is opportunity for local governments to prepare for climate change, where prudent, and increase citizen's awareness of potential impacts. Preparation for weather related disasters is one more way to reduce serious injuries and fatalities in the US 195 corridor. Improved and increased communications with the travelling public on the US 195 corridor via intelligent transportation systems (ITS) including the addition of variable messaging signs (VMS), remote weather systems (RMS), and maintenance equipment with global positioning may be viable as countermeasures to impacts of climate change. For a complete climate change process discussion, refer to the WSDOT's "Climate Impacts Vulnerability Assessment Report, November 2011."



# Roadway Geometry

## What is roadway geometry?

Roadway geometry is the branch of highway engineering that is concerned with roadway design of elements such as vertical and horizontal curves, lane widths, sight distance, speed, cross-section dimensions, etc.

The objective for a roadway designer is to optimize efficiency and safety of the roadway for the users, while minimizing costs and environmental damage.

The following US 195 roadway geometrics (physical elements) were evaluated as part of this study:

- **Passing Lanes** allow motorists increased opportunities to safely and easily pass slower vehicles, and improve traffic flow at a much lower cost than adding another lane would.
- **Passing Sight Distance** is the length of roadway that the driver of a passing vehicle must be able to see initially in order to make a passing maneuver safely and efficiently.
- **Speed** is based on the speed that 85% of drivers drive safely on a particular road. Monitoring this is actually how most speed limits are set. Most drivers will drive as fast as the roadway will comfortably allow, regardless of the posted speed.
- **Intersections** are where two or more roads join or cross, and often are a major source of vehicle crashes between road users, due to turning and crossing maneuvers. Angle crashes are the number one fatal or serious injury crashes type. Angle crashes usually involve vehicles turning in front of an oncoming vehicle, or vehicles entering an intersection at 90 degrees directly in front of an oncoming vehicle.
- **Decision Sight Distance** is the distance required for a driver to detect an unexpected condition, select an appropriate speed and path, and initiate and complete the required maneuver safely and efficiently.
- **Slope Flattening** the act of flattening side slopes and the removal of obstructions to create a recovery area for errant vehicles that leave the roadway. Side slope flattening effectively reduces the frequency and severity of roadway departure crashes.
- **Horizontal Curves** provide a transition section between two tangent sections of roadway, they allow a vehicle to negotiate a turn at a gradual rate rather than a sharp one.

### Funding

Due to limited state funding, recommendations in this study will compete for funding with other proposed improvements around the state based on performance outcome.

## What were the benefits of discussing roadway design as part of this study?

It provided an opportunity to begin a dialog between WSDOT the Technical Advisory Committee, and the public to discuss corridor safety improvements, and to present low-cost, high benefit solutions that are efficient and sustainable. The solutions presented in this chapter offer a greater benefit per dollar invested when compared to a high cost corridor expansion project, such as a divided highway with interchanges, as mentioned by many corridor users interviewed. It also provided us an opportunity to work together with our safety partners to integrate the Four E's — engineering, education, enforcement and emergency medical services to develop cost-effective countermeasures that may potentially reduce highway fatalities and serious injuries, and enable WSDOT decision makers to strategically align priorities and leverage resource.

# Roadway Geometry

## Why consider adding more passing lanes?

During US 195 Corridor listening posts forums, public outreach surveys and other public involvement events, the public repeatedly expressed their desire for additional passing lanes.

## What has WSDOT done about passing lanes?

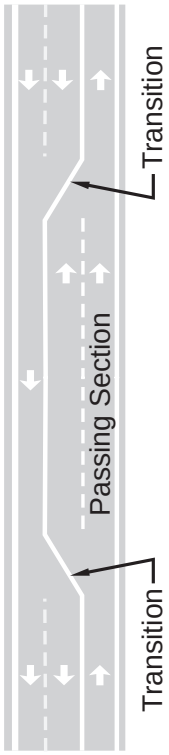
Passing lanes are not a new idea for this corridor to WSDOT. In fact, in 2007 WSDOT Eastern Region Project Definition Engineers prepared a study to investigate the operational and safety benefits of providing passing lanes between Pullman and Spangle.

As part of that study they:

- Reviewed design standards and current technical literature for passing lanes.
- Collected and reviewed existing roadway geometrics data along the corridor.
- Collected and reviewed corridor accident data from the years 2005 to 2009.
- Ultimately recommended passing lanes using a "2+1"passing lane design.
- Identified potential locations for passing lanes, and prepared planning level cost estimates to design and construct "2+1"passing lanes.

## What is a 2+1 passing lane?

A 2+1 passing lane is a continuous three-lane cross section (two lanes in one direction and one lane in the other) with alternating passing lanes. See Exhibit Geometrics - 1.




**2+1 Passing Lane — Exhibit Geometrics - 1.**

## What are the advantages of a 2+1 passing lane design?

The advantages are:

1. They have demonstrated substantial safety benefits in Europe, and are recommended for use in the United States.
2. They are appropriate for level or rolling terrain. *(In mountainous terrain or on isolated steep grades truck climbing lanes are still preferable).*
3. They are recommended for consideration on highways with a traffic flow rate up to 1200 vehicle per hour, in one direction of travel.
4. Their lengths are typically consistent with optimal lengths for isolated passing lanes on two lane highways.
5. Their roadway crown and super elevations are consistent with current design standards (state and/or AAHSTO).

# Roadway Geometry

6. Major intersections should be located in the buffer or transition areas between opposing passing lanes on 2+1 roadways; whereas low volume intersections and driveways can be located within passing lane sections.

## Is using a 2+1 roadway passing lane design a practical option for US 195?

A review of American Association of State Highway and Transportation Officials (AAHSTO), WSDOT, Idaho, Colorado, Oregon and Minnesota design standards revealed climbing lane, passing lane and shoulder driving design standard considerations are similar from state to state. The reviewed states base auxiliary lanes design standards on the AASHTO criteria with some variations in evaluation methodologies, while other states refer to the Highway Capacity Manual. In general, climbing lanes or passing lanes are installed on two lane highways at locations that are warranted by the respective evaluation methodology.

There are numerous recent technical reports that refer to "Super 2" or "2+1 Passing Lane Designs". The use of this roadway design was pioneered in Europe, to be utilized at locations where four-lane highways are not justifiable. Whether it's from engineering, environmental, physical or fiscal constraints, Europeans have found a two-lane facility with alternating passing lanes is a practical alternative.

***This 2+1 passing design configuration has a continuous three-lane cross section with alternating passing lanes.***

The National Cooperative Highway Research Program report under the Research Results Digest of April 2003 summarized the 2+1 design in Europe and its potential application on rural two-lane highways in the United States. Selected states (Texas, Arkansas and Kansas) have begun implementing 2+1 design standards for rural roadways.

Comprehensive safety evaluations of 2+1 designs have not been completed within the United States. However, the National Cooperative Highway Research Program (NCHRP) Project 20-7 evaluated the performance of 2+1 passing lanes in Europe and found the following results:

- In Germany, 2+1 roads operate with accident rates 36 percent lower than conventional two-lane highways.
- Finland has estimated that 2+1 roads operate with accident rates 22–46% lower than conventional two-lane highways.
- Sweden observed a 55% reduction in fatal and injury accidents with the implementation of 2+1 roads using the median cable barrier design. Note, the median cable barrier design is not recommended in the US.

# Roadway Geometry

## What was the primary objective of the 2007 WSDOT US 195 Passing Lane Study?

The primary objective of the US 195 Passing Lane Study, completed by the WSDOT Eastern Region Project Definition Engineers in 2007, was to:

- Investigate the potential operational safety benefits of providing auxiliary passing lanes between the Pullman and Spangle.
- Identify potential locations for passing lanes, and prepare planning level cost estimates.

***Passing lanes are often constructed on two-lane roadways to improve overall traffic operations by breaking up traffic platoons and reduce delays caused by inadequate passing opportunities over substantial lengths of roadway.***

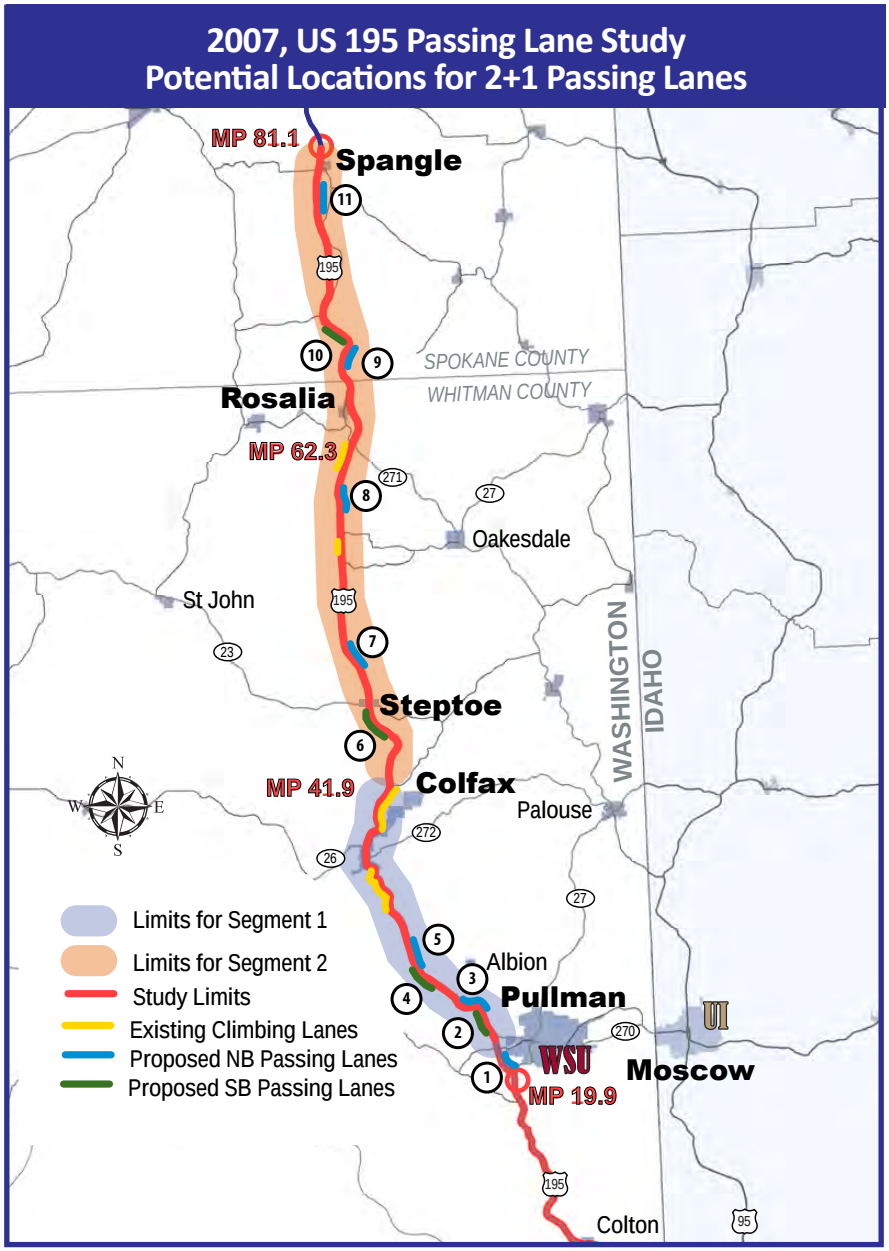
The study extended from the junction of SR 27 just south of Pullman, to the beginning of the four-lane section just north of Spangle, MP 19.9 to 81.1. See Exhibit Geometrics - 2.

The route was further divided into two segments; the first segment extends from Pullman, (junction of SR 27) to Colfax. The second segment extended from Colfax to Spangle. These segments were based on the routes current configuration, the differing operational characteristics associated with the two highway segments, and their unique environmental and economic considerations. Both segments meet WSDOT's warrant of Level of Service (LOS) for passing lanes. LOS is a measure used by traffic engineers to determine the effectiveness of transportation features.

## What were WSDOT's crash reduction findings regarding the 2+1 passing lanes?

Upon review of the passing lane and "2+1" literature, WSDOT Eastern Region Project Definition Engineers found a 2+1 design can generally provide a 7% to 25% crash reduction, depending on the frequency of the alternating passing lanes.

# Roadway Geometry




**2007, US 195 Passing Lane Study Potential Location for 2+1 Passing Lanes — Exhibit Geometrics - 2.**

| Cost Estimate for 2+1 Passing Lanes by Segment | | |
|---|---|---|
| Segment | Cost Estimate | |
| 1. Pullman to Colfax | Low $7 Million | High $14 Million |
| 2. Colfax to Spangle | Low $9 Million | High $18 Million |
| Estimated project cost for the proposed 2+1 passing lane design in 2012 dollars. | | |

**2007, US 195 Passing Lane Study Potential Location for 2+1 Passing Lanes Cost Estimate — Exhibit Geometrics - 3.**

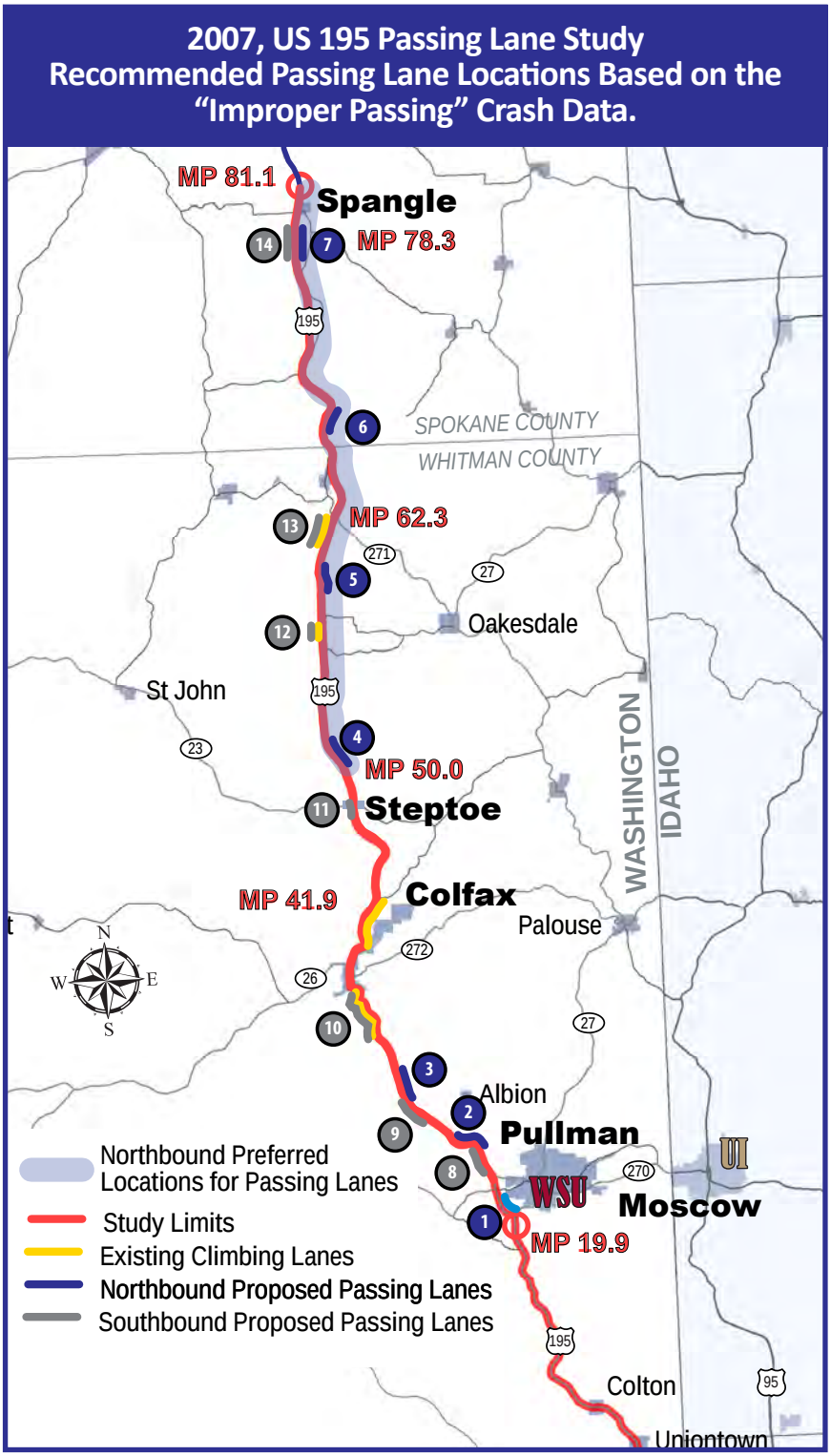
## What did the Eastern Region Project Definition Engineers ultimately recommend for 2+1 Passing Lanes?

For **Segment 1 —** from Pullman to Colfax; alternating passing lanes were proposed on an "**intermediate**" passing lane frequency, based on the 2+1 design. With passing opportunity for both the northbound and southbound directions, at three mile intervals. Five new passing lanes were recommended for design and construction. See Exhibit Geometrics - 2.

For **Segment 2 —** from Colfax to Spangle; alternating passing lanes were recommended on a "**minimal**" passing lane frequency, based on the 2+1 design. The passing lanes are proposed at locations that will complement the existing climbing lanes. The locations are at a frequency of approximately every seven miles for both northbound and southbound directions. Six new passing lanes were recommended for design and construction. See Exhibit Geometrics - 2.

The cost to design and construct approximately six miles of climbing lanes in 1993 was $2.5 million or $420,000 per lane mile. The cost in 2009 dollars for the same project was $4.35 million or $800,000 per lane mile. See Exhibit Geometrics - 3 for cost estimates for segments 1 and 2.

# Roadway Geometry




007, US 195 Passing Lane Study Recommended Passing Lane Locations Based on the "Improper Passing" Crash Data — Exhibit Geometrics - 4.

## Where are additional passing lanes recommended based on "Improper Passing" crash data?

US 195 Passing Lane Study, completed by the WSDOT Eastern Region Project Definition Engineers in 2007, also evaluated 'Improper Passing" crashes from 2005 to 2009, to identify the potential benefits and locations of the additional passing lanes, as a Target Zero countermeasure.

The crash data in the vicinity of the proposed passing lanes (included a two mile "buffer" on each end) to provide for proposed signage, such as: "Passing Lane 2 Miles Ahead", that could influence drivers' passing activities prior the actual passing lanes.

The data indicates the limits of the proposed northbound passing lanes, particularly in the two mile buffers areas are currently experiencing crashes. And that there are less "Improper Passing" crashes in the proposed southbound passing lane limits. This notable difference is probably attributed to the current availability of three existing climbing/passing lanes in the southbound direction.

Based on the crash data, the preferred locations to mitigate "Improper Passing" crashes with passing lanes is in the northbound direction, from milepost 50.0 to 78.3. See Exhibits Geometrics 4 and 5.

# Roadway Geometry

The northbound segment has the highest severity of "Improper Passing" crashes are from milepost 58.85 to 78.30. See Exhibits Geometrics 4 and 5.

## What is passing sight distance?

Passing sight distance is the minimum length of roadway the driver of a passing vehicle must be able to initially see prior to making the passing maneuver.

## How is passing sight distance determined?

A passing sight distance survey determines the distance required to safely pass a moving vehicle, based on WSDOT's Design Manual standards. The survey takes two vehicles. The trailing vehicle locks onto the sight target on the lead vehicle. A distance measuring instrument (DMI) computer enables the operators to maintain a preset distance based on the existing speed limit. The comparison between DMI readings is communicated between vehicles through radio signals The tracking vehicle records the mileposts where the targets "begin no sight" and "end no sight". This survey data along with further evaluation from Eastern Region Traffic Engineers influence decisions regarding "no passing" striping limits.

**2007, US 195 Study Passing Lane Recommended Passing Lane Locations Based on the "Improper Passing" Crash Data**

| Map Number | Proposed **Northbound** Passing Lanes | Crashes | Severity | 2-Mile Buffer Crashes | Total Severity |
|---|---|---|---|---|---|
| 1 | MP 19.96 – MP 21.10 | 0 | 0 | 0 | 0 |
| 2 | MP 25.98 – MP 27.48 | 2 | $82,000 | 1 | $122,000 |
| 3 | MP 30.74 – MP 32.24 | 0 | $0 | 0 | $0 |
| 4 | MP 50.00 – MP 51.40 | 1 | $7,000 | 6 | $42,000 |
| 5 | MP 58.85 – MP 60.00 | 1 | $1,200,000 | 1 | $1,240,000 |
| 6 | MP 67.17 – MP 68.30 | 0 | $0 | 2 | $1,200,000 |
| 7 | MP 76.80 – MP 78.30 | 4 | $61,000 | 3 | $150,0000 |

| Map Number | Proposed **Southbound** Passing Lanes | Crashes | Severity | 2-Mile Buffer Crashes | Total Severity |
|---|---|---|---|---|---|
| 8 | MP 22.66 – MP 25.80 | 0 | $0 | 0 | $0 |
| 9 | MP 29.24 – MP 30.74 | 0 | $0 | 0 | $0 |
| 10 | MP 34.38 – MP 36.91 (Existing Passing Lane) | 0 | $0 | 0 | $0 |
| 11 | MP 47.35 – MP 47.85 | 0 | $0 | 0 | $0 |
| 12 | MP 56.54 – MP 57.15 (Existing Passing Lane) | 1 | $7,000 | 0 | $7,000 |
| 13 | MP 61.08 – MP 62.36 (Existing Passing Lane) | 0 | $0 | 0 | $0 |
| 14 | MP 76.80 – MP 78.30 | 0 | $0 | 1 | $75,000 |

Summary of the "Improper Passing" crash data in the vicinity of the passing lanes that were proposed in the 2007, US 195 Passing Lane Study (includes a two mile "buffer" on each end). See Passing Lane Locations Based on the "Improper Passing" Crash Data Map.

**2007, US 195 Passing Lane Study Recommended Passing Lane Locations Based on the "Improper Passing" Crash Data — Exhibit Geometrics - 5.**

# Roadway Geometry

## Why was a passing sight distance survey initiated?

During several public involvement events, the public expressed concerns about “passing”/“no passing” lane striping. There was a perception that some of the existing no passing striping lengths were not long enough for vehicles to complete a passing maneuver in a safe manner. This led the WSDOT Programming/Geographic Service GIS & Roadway Data Office to initiate and perform a passing sight distance survey, as part of the US 195 Corridor Crash Analysis in the spring of 2011.

## What were the results of the US 195 passing sight distance survey?

The sight distance survey findings were compared to existing “passing”/“no passing” striping, and there were apparent instances where the sight survey and existing “passing”/“no passing” striping did not align. The Eastern Region Traffic Office will further evaluate, verify and review this striping data to identify if there is a need for any striping modifications. If changes are found necessary, they will be implemented on future construction contracts or maintenance striping projects, just like they were on the 2012, Babbit Road to Colfax – Paving project.


***Passing lanes improve safety by providing assured passing opportunities without the need for the passing driver to use the opposing traffic lane.***

# Roadway Geometry

## How are speed limits determined?

State law (RCW 46.61.400) sets Washington's basic speed laws and the maximum speed limits for state highways, county roads, and city streets. The statute also authorizes agencies to raise or lower these maximum speed limits, when supported by an engineering and traffic investigation. Most states have a basic speed law which recognizes that driving conditions and speeds may vary widely from time to time. No posted speed limit can adequately serve all driving conditions. Motorists must constantly adjust their driving behavior to fit the conditions. Speed limits encourage consistent travel speeds by reducing the speed differentials between vehicles.

## What is a speed study?

Speed limits reflecting the speed most motorists naturally drive and are selected in part by determining the 85th percentile speed (the speed that 85 out of 100 vehicles travel at or below). This method, typically involving a speed study and is based on the principle that reasonable drivers will consider existing roadway and roadside conditions when selecting travel speeds.

When setting speed limits, engineers also consider other factors like:

- Roadway characteristics, shoulder condition, grade, alignment and sight distance.
- Roadside development and lighting.
- Parking practices, e.g., angle parking, and pedestrian and bicycle activity.
- Crash rates and traffic volume trends.
- Right lane/entering traffic conflicts (for freeways).

A speed study is a snapshot of traffic speed at a single location. This representation helps engineers validate existing regulated speed limits or identify opportunities to improve traffic operations. Speed studies provide a sound indication of how well traffic at a particular location conforms to the posted speed limit, relative to the 85 percentile travel speed. The range of travel speeds is reduced when speed limits are set near the 85th percentile speed and adjusted for the other influencing factors. The survey is less reliable as distance from the survey location increases. Therefore, several studies would be necessary on a long corridor such as US 195.

As travel speeds and traffic volumes along a corridor vary throughout the day and week, multiple speed studies may be required to capture a sound understanding of the travel speeds. Traffic counts during a Monday morning or a Friday peak period may show exceptionally high volumes and are not normally used in the analysis. Therefore, counts are usually conducted on a Tuesday, Wednesday, and Thursday. Spot speed data is gathered using one of three methods:

1. Stopwatch method,
2. Radar meter method, or
3. Pneumatic road tube traffic counter method.

# Roadway Geometry

## Why should a speed study on US 195 be initiated?

During the development of this study, the public expressed concerns about aggressive drivers, risky passing, and slow moving vehicles traveling on the US 195. The various travel speeds generated by these types of behaviors can be a contributing factor to increased vehicle conflicts and crashes and is of concern due to the diversity of travelers on the US 195 Corridor. Including daily commuters, older and young drivers travelling to and from employment, educational institutions, commercial centers and airports, who must also share the road with slow moving seasonal agricultural equipment, travelers unfamiliar with this highway and the large volume of truck traffic.

## How did we evaluate intersections as part of this study?

One of the tools used for evaluating intersections was the Intersection Analysis Location List (IALL). This statewide list ranks intersections using average societal cost per each target intersection, depending on the type of crash for the last five years. This helps WSDOT decision makers to understand where the significant needs are in the state and the individual Regions. The IALL was created by generating an initial list of all intersections and intersection clusters that had one or more of specific crash types; at angle, left turn opposite direction and rear end. To expedite the development of an all-inclusive statewide intersection list and reduce the manual analysis effort, a combined use of crash records, GIS and & SR View applications were employed.

The Intersection Analysis Location List has 5,000 intersections statewide and the characteristics of those intersections may change due to higher or lower severity or improvements. Although the intersection ranking in the IALL is used to determine intersection priorities.

The list of intersection clusters were further prioritized based on a statewide average societal cost per target intersection crash type for each intersection crash cluster.

The initial IALL was forwarded to all WSDOT regions for a scoping evaluation, with the objective of recommending the lowest cost safety improvement that will achieve positive safety benefits depending crash history. Each intersection is reviewed with a corridor/adjacent intersection perspective and examined using a minimum 10-year growth horizon beyond projected year of opening.

## What is the IALL review process for identifying and addressing intersection-related crashes?

Countermeasures for each intersection that address the contributing factors of the crashes, are derived through the following IALL Solution Scoping Process:

1. Identify intersection locations that have been improved with projects and/or actions within the five year analysis period, or are funded to be completed by the end of the 2011-13 biennia.
2. Identify potential solutions that may involve the Washington State Patrol (WSP) or the Washington Traffic Safety Commission's (WTSC) local Target Zero groups.
3. Identify WSDOT Traffic Office fixes through the Low-cost Enhancement Program.
4. Identify Scoping Safety Improvements solutions.

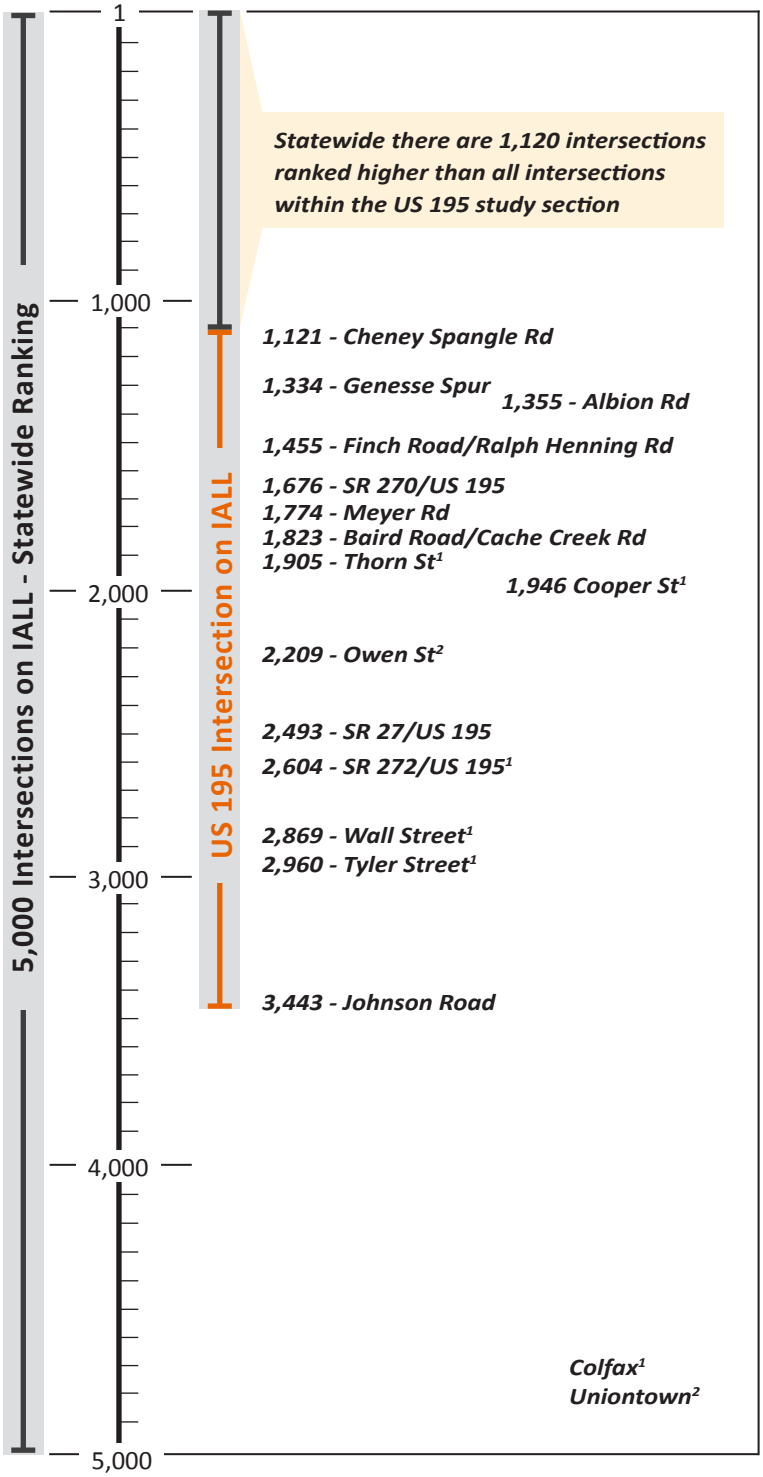
# Roadway Geometry

5. The final avenue for addressing intersection-related crashes is to develop an improvement (I-2) Safety Program solution, in accordance with the Design Manual Intersection Control Chapter. I-2 Safety Program solutions should be considered only after all other enforcement, education, or Low-cost Enhancement solutions have been explored.

## Are there intersections within the limits of the US 195 Study on the IALL?

All the Intersections within the study limits are on the IALL. The adjacent table shows these intersections. These intersections are ranked and indicate the highest needs in the study corridor prior to refined analysis in the IALL review process. The statewide prioritization highlights the ranking of the US 195 study intersections in comparison to others around the state. At the time this section was prepared (2012) the list had not been evaluated in the IALL review phase. Therefore no countermeasures have been identified, prioritized, or programmed for funding. Note, the following intersection priority ranking may change based on the review process.

### 2011 Intersection Analysis Location List (IALL)



# Roadway Geometry

## What is decision sight distance?

Decision sight distance is the distance required for a driver to detect an unexpected condition, determine an appropriate maneuver, and then perform that maneuver.

As part of this study we evaluated intersection sight distance and found that there are six intersections that do not meet the rural sight decision distance of 1050', or the stopping decision sight distance of 695'. Those intersections are shown below in light blue on the Intersection Stopping Sight Distance and Decision Sight Distance with Crash Data and Costs table (Exhibit

**Intersection Stopping Sight Distance & Decision Sight Distance with Crash Data and Costs.**

| Intersection | ❶ US 195 Spur (Genesse Spur) | ❷ Johnson Road | ❸ Enman Kincaid Road | ❹ Parvin Road | ❺ McMeekin Road | ❻ Merritt Road |
|---|---|---|---|---|---|---|
| **Mile Post** | 0.06 | 13.3 | 25.9 | 35.0 | 49.7 | 64.8 |
| **Feature Type** | T-Intersection | Right Angle | T-Intersection | T-Intersection | T-Intersection | T-Intersection |
| **Existing Sight Distance (ft) North** | 910' | 660' | 1050+ | 1050+ | 800' | 850' |
| **Existing Sight Distance (ft) South** | 810' | 760' | 600' | 760' | 1050+ | 1050+ |
| **Existing Stopping Distance (ft) North** | 695+ | 695+ | 695+ | 650' | 650' | 680' |
| **Existing Stopping Distance (ft) South** | 695+ | 680' | 660' | 600' | 670' | 680' |
| **Crash Type** | At Intersection (2) | At Intersection (2) | Non Intersection Non Related (2) | Non Intersection Non Related (1) | At Intersection Not Related (1) | At Intersection (1) |
| **Injury Type** Property Damage Only (PDO) | 1 PDO; 1 Serious | 2 PDO | 2 PDO | 1 Evident | 1 PDO1 PDO | No Crashess |
| **Severity** | $1,207,000* | $14,000 | $14,000 | $75,000 | $7,000 $7000 | |
| **Potential Countermeasure** | Additional Signage & Relocate Stop Bar (Completed 2010) Lay Back Ditch Slopes | Additional Signage & Lay Back Ditch Slopes | Additional Signage & Lay Back Ditch Slope | Additional Signage | Additional Signage & Lay Back Ditch Slope | |

The Idaho State Line to Colton paving project in 2010 evaluated back slopes at Genesse Spur and it considered mitigation that would lay back ditch slopes north of the intersection for sight distance based on "spot safety" funding. However, the Colton project's funds for "spot safety" were not sufficient for the improvement. The estimate for mitigation was $14,000 (Range -30% to 50%). The Idaho State Line to Colton project provided additional signage south of the intersection, and relocated the stop bar so drivers would have an increased line of sight.

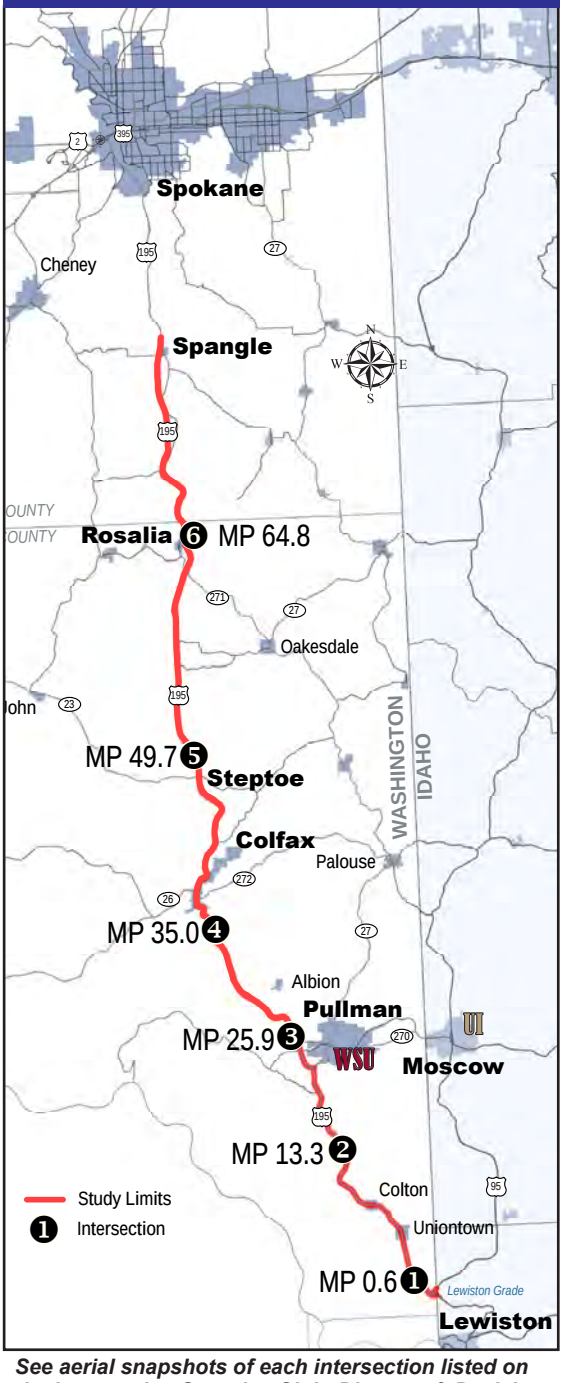
**Intersection Stopping Sight Distance and Decision Sight Distance with Crash Data and the Associate Severity Cost — Exhibit Geometrics - 9.**

Geometrics - 9). The table also shows the correlation between injury types, severity costs and potential sight distance countermeasures.


*Aerial view of the US 195/US 195 Spur (Genesse Spur) Intersection, MP 0.06.*


*Aerial view of the US 195/Johnson Road Intersection, MP 13.3.*

## Vicinity Map of Intersections with Sight Distance Deficiencies




*See aerial snapshots of each intersection listed on the Intersection Stopping Sight Distance & Decision Sight Distance with Crash Data and Costs Table (Exhibit Geometrics - 9*

Vicinity Map of Intersections with Sight Distance Deficiencies — Exhibit Geometrics - 10.

# Roadway Geometry


*Aerial view of the US 195/Enman-Kincaid Road Intersection, MP 25.9.*


*Aerial view of the US 195/Parvin Road Intersection, MP 35.0.*


*Aerial view of the US 195 /McMeekin Road Intersection MP 49.7.*

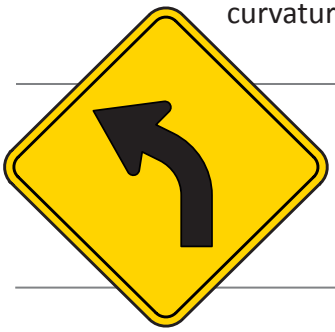

*Aerial view of the US 195/Merritt Road, MP 64.8.*

# Roadway Geometry

## How are curves evaluated?

A horizontal curve with a small radius on a high speed roadway segment needs an increased superelevation (bank) in order to assure a safe transition through the curve. A process known as ball banking is used to determine the safe driving speeds of the curve. A ball banking inclinometer is used for the specific purpose of determining safe (uniform advisory) curve speeds for horizontal curves. It measures the overturning force (side friction) in degrees on a vehicle negotiating a horizontal curve — whether it is an isolated curve, multiple "S" curve, or a ramp to or from a freeway. Ball Banking is a tool used to determine if the existing speed limit of a curve can be driven safely and comfortably by most drivers. If it can not, a lower advisory speed limit sign and/or warning sign, such as TURN or CURVE ahead are needed to alert motorists of the pending horizontal curvature in the roadway alignment.

*A typical ball banking Indicator.*



*The horizontal alignment "CURVE" ahead advisory warning sign alerts motorists of the pending horizontal curvature in the roadway alignment.*

## Were the curves evaluated within the study limits?

WSDOT Eastern Region Traffic Office reviewed all the curves within our study limits utilizing their exiting historical data base or through on-site inspections, during the winter of 2010. They found that *all the existing signage is correct and no new or additional signs are necessary.*

As a standard practice, the traffic office evaluates proposed construction projects (utilizing a ball banking inclinometer) looking for signage deficiencies, as part of the scoping process; to insure adequate funding is included in the project cost estimate to cover new, additional or updated signing needs. Since the years 1997 to 2012, nine projects have been constructed within our study limits; therefore all curves within the study limits have been evaluated and upgraded if warranted. See US 195 Corridor Study Segment Past Construction Projects table (Exhibit Geometrics - 12) for project limits, names and year constructed.

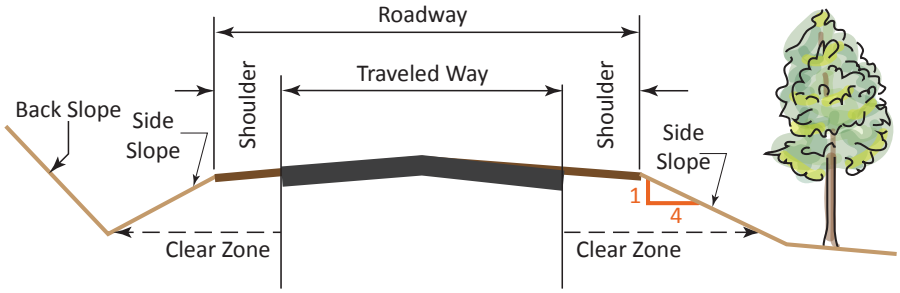
# Roadway Geometry

## Why flatten side slope?

The AASHTO Roadside Design Guide defines a clear zone as the total roadside border area, starting at the edge of the traveled way, available for safe use by errant vehicles. This area may consist of a shoulder, a recoverable side slope, a non-recoverable slope, and/or a clear run-out area. A recoverable side slope is a slope on which a motorist may, to a greater or lesser extent, retain or regain control of a vehicle by slowing or stopping. Side slopes flatter than 1V:4H are generally recoverable.

An evaluation of the clear zone is conducted to identify where additional funding may be needed to install guardrail, flatten slopes, and remove obstructions. Later, when the project is under construction, improvements such as flattening side slopes and removing obstructions are done to create a safer clear zone *(an unobstructed traversable roadside area designed to enable a driver to stop safely or regain control of a vehicle that has accidentally left the roadway)*.

**Clear Zone Diagram**




The a clear zone as the total roadside border area, starting at the edge of the traveled way, available for safe use by errant vehicles.

**Clear Zone Diagram — Exhibit Geometrics - 11.**


***Example of where flattening to a 1V:4H or flatter would provide a reasonable side slope***

Slopes steeper than 1V:3H are not considered traversable and may warrant guardrail installation. Improving the clear zones and flattening slopes are effective Target Zero countermeasures for prevention and mitigation of roadway departure crashes. An engineering study would need to be conducted to identify locations where these improvement are warranted based on design standards and crash history data.

In 2010, the US 195 Cashup Flats to Jct. SR 271 – Guardrail Safety Improvement project upgraded guardrail to meet current post spacing, and upgraded terminals to current standards.

See the nine projects listed on the US 195 Corridor Study Segment Past Construction Projects table (Exhibit Geometrics 12) to review where clear zones have been enhanced and/or improved.

| Past Construction Projects within the US 195 Corridor Study Limits | | | |
|---|---|---|---|
| **#** | **Mileposts in Numerical Order** | **Project Name** | **Year** |
| 1 | MP 0.0 - 8.61 | US 195 Idaho State Line to Colton – Paving | 2010 |
| 2 | MP 8.61 - 29.10 | US 195 Colton to Babbit Road | 1999 |
| 3 | MP 28.82 - 37.55 | US 195 Babbit Road to Colfax – Paving | 2012 |
| 4 | MP 38.50 - 44.40 | US 195 Bridge 195/27 | 1998 |
| 5 | MP 44.40 - 48.45 | US 195 MP 44.40 to Bridge 195/34 | 1999 |
| 6 | MP 48.48 - 53.76 | US 195 Bridges 194/34 to Bridge 195/38 | 1997 |
| 7 | MP 53.60 - 62.25 | US 195 Cashup Flats to Jct. SR 271 – Guardrail | 2010 |
| 8 | MP 62.15 - 69.94 | US 195 SR 271 to Vicinity of Plaza Rd. – Paving | 2006 |
| 9 | MP 69.94 - 80.46 | US 195 Plaza to Vic. Cornwall Rd. | 2000 |

The above construction projects evaluated curves and brought guardrail and slope grade up to current standards.

**Past Construction Projects within the US 195 Corridor Study Limits — Exhibit Geometrics - 12.**

***Guardrail being inspected, evaluated and measured for the US 195 Cashup Flats to Jct. SR 271 — Guardrail Safety Improvement project, fall 2010.***

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# Public Transportation

## Why is public transportation demographics important?

While serving as a major regional freight corridor, the US 195 Corridor from Spangle, Washington to the Washington/Idaho State Line, is also a primary commuter route for travelers who seek to access medical services, commercial/retail business centers, the Spokane International Airport, Washington State University, the University of Idaho and various Spokane and Whitman County communities along the corridor. Conversely the corridor serves as a primary route to connect Spokane County originating travelers with universities, employment centers, and other destinations in the Palouse and Idaho.

Various public and private transportation providers serve the communities along the US 195 Corridor and this is why decisions regarding public transportation planning typically rely on the evaluation of local demographic information.

*Knowledge of who our transit customers are, and how they travel is essential for tailoring transit service to meet each community's needs.*

The following tables provide demographic information about the communities served by public transportation in the vicinity of the US 195 corridor.

**Basic Population Characteristics (2010)**

| Area | 2010 Total Population | % of the States Population | % Persons Age 65+ | % Person w/ Disability | % Below Poverty |
|---|---|---|---|---|---|
| Washington State | 6,561,297 | | 12.3% | 18.20% | 12.1% |
| County | | | | | |
| Asotin | 21,363 | 0.33% | 19.3% | 22.7% | 13.5% |
| Columbia | 3,957 | 0.06% | 23.0% | 24.6% | 16.4% |
| Garfield | 2,240 | 0.03% | 22.3% | 20.1% | 15.7% |
| Spokane | 461,262 | 7.03% | 12.9% | 19.1% | 14.1% |
| Whitman | 43,747 | 0.67% | 9.5% | 12.5% | 27.6% |
| Total | | 8.12% | | | |
| Rural Towns or City | | | | | |
| Asotin, Asotin County | 1,251 | 0.02% | 17.6% | 17.3% | 12.9% |
| Clarkston, Asotin County | 7,229 | 0.11% | 16.9% | 27.4% | 23.5% |
| Colfax, Whitman County | 2,805 | 0.04% | 21.2% | 24.2% | 8.7% |
| Colton, Whitman County | 418 | 0.01% | 15.6% | 15.5% | 2.5% |
| Oakesdale, Whitman County | 422 | 0.01% | 18.5% | 13.4% | 0.9% |
| Palouse, Whitman County | 998 | 0.02% | 14.4% | 14.6% | 14.9% |
| Pullman, Whitman County | 29,799 | 0.45% | 4.7% | 9.1% | 39.2% |
| Rosalia, Whitman County | 550 | 0.01% | 16.5% | 17.0% | 12.6% |
| Spangle, Spokane County | 278 | 0.00% | 19.8% | - | 24.4% |
| Tekoa, Whitman County | 778 | 0.01% | 23.0% | 27.4% | 18.9% |
| Total | 44,528 | 8.80% | | | |

***Source: US. Census 2000 and 2010 data.***
**Basic Population Characteristics (2010)**

# Public Transportation

| Youth Age 15 to 24 Years Old (2010) | | | |
|---|---|---|---|
| Area | Total Population | 15 to 24 Population | % of Total Pop. |
| Washington State | 6,724,540 | 930,181 | 13.8% |
| County | | | |
| Asotin | 21,623 | 2,579 | 11.9% |
| Columbia | 4,078 | 361 | 8.9% |
| Garfield | 2,266 | 211 | 9.3% |
| Spokane | 471,221 | 73,683 | 15.6% |
| Whitman | 44,776 | 17,986 | 40.2% |
| Rural Town or City | | | |
| Asotin, Asotin County | 1,251 | 128 | 10.2% |
| Clarkston, Asotin County | 7,229 | 1,040 | 14.4% |
| Colfax, Whitman County | 2,805 | 286 | 10.2% |
| Colton, Whitman County | 418 | 43 | 10.3% |
| Oakesdale, Whitman County | 422 | 47 | 11.1% |
| Palouse, Whitman County | 998 | 99 | 9.9% |
| Pullman, Whitman County | 29,799 | 16,517 | 55.4% |
| Rosalia, Whitman County | 550 | 57 | 10.4% |
| Spangle, Spokane County | 278 | 36 | 12.9% |
| Tekoa, Whitman County | 778 | 74 | 9.5% |
| ***Source: US. Census 2010 data*** **Basic Population Characteristics (2010)** | | | |

| Median Income (2010) | | |
|---|---|---|
| Area | Income | % Living in Poverty |
| Washington State | 69,328 | 12.1% |
| County | | |
| Asotin | 52,250 | 13.5% |
| Columbia | 53,452 | 16.4% |
| Garfield | 55,769 | 15.7% |
| Spokane | 59,999 | 14.1% |
| Whitman | 61,598 | 27.6% |
| Rural Town or City | | |
| Asotin, Asotin County | 55,163 | 12.9% |
| Clarkston, Asotin County | 35,534 | 23.5% |
| Colfax, Whitman County | 63,942 | 8.7% |
| Colton, Whitman County | 81,071 | 2.5% |
| Oakesdale, Whitman County | 70,000 | 0.9% |
| Palouse, Whitman County | 46,429 | 14.9% |
| Pullman, Whitman County | 67,711 | 39.2% |
| Rosalia, Whitman County | 33,750 | 12.6% |
| Spangle, Spokane County | 38,750 | 24.4% |
| Tekoa, Whitman County | 38,269 | 18.9% |
| ***US. Census 2010 data*** **Median Income (2010) .** | | |

| 2010 Households Without a Vehicle (2010) | |
|---|---|
| Area | Households Without a Vehicle |
| Washington State | 6.5% |
| County | |
| Asotin | 5.4% |
| Columbia | 5.8% |
| Garfield | 5.1% |
| Spokane | 7.2% |
| Whitman | 6.8% |
| Rural Town or City | |
| Asotin, Asotin County | <0.1% |
| Clarkston, Asotin County | 11.4% |
| Colfax, Whitman County | 6.6% |
| Colton, Whitman County | 2.4% |
| Oakesdale, Whitman County | <0.1% |
| Palouse, Whitman County | 1.7% |
| Pullman, Whitman County | 9.0% |
| Rosalia, Whitman County | 6.2% |
| Spangle, Spokane County | 8.7% |
| Tekoa, Whitman County | 3.6% |
| ***Source: US. Census 2010 data*** **Households Without a Vehicle (2010)** | |

# Public Transportation

## Public Transportation Grants

To plan and ultimately assist with providing transportation services, the Washington State Department of Transportation (WSDOT) administers a competitive consolidated grant program for State and Federal Transit Administration (FTA) funds. A mix of state (rural mobility and paratransit and or special needs non-profit) and federal (rural mobility, special needs, job access and New Freedom) grants, the WSDOT consolidated grant program, in the 2011 -2013 biennium, included approximately $13.7 million state funds matched with approximately $25.8 million in federal funds.

Grants improve public transportation within and between rural communities, provide transportation services between cities, purchase new buses and other equipment, and provide public transportation service for the elderly and persons with disabilities.

The Federal Transit Administration (FTA) requires that all federally funded public transportation projects are derived from a locally developed Coordinated Human Services Transportation Plan (CHSTP). During the process of developing the plan input is gathered from public, private, and non-profit transportation representatives, as well as human services agencies and the general public. Plans include strategies that meet the specific needs of the local communities' elderly, disabled or lower-income individuals, and must prioritize transportation services for funding and implementation.

To address Washington State requirements the plan also provides for "People with Special Needs." People with special transportation needs are defined in state law as people including their attendants, who because of physical or mental disability, income status, or age, are unable to transport themselves, or purchase transportation. [Chapter 47.06B RCW].

*Special needs transportation is any mode of transportation used by those defined as transportation disadvantaged or with a special transportation need. This includes buses that have regular stops (e.g., fixed route for public transportation and schools) specialized services such as vans, ambulances and taxis that pickup people at the curb or door (e.g., demand response or dial-a-ride), rideshare programs, volunteer driver services, ferries, trains, or any federal, state, and local publicly funded transportation service or program*.

## What is addressed in a Coordinated Human Services Transportation Plan?

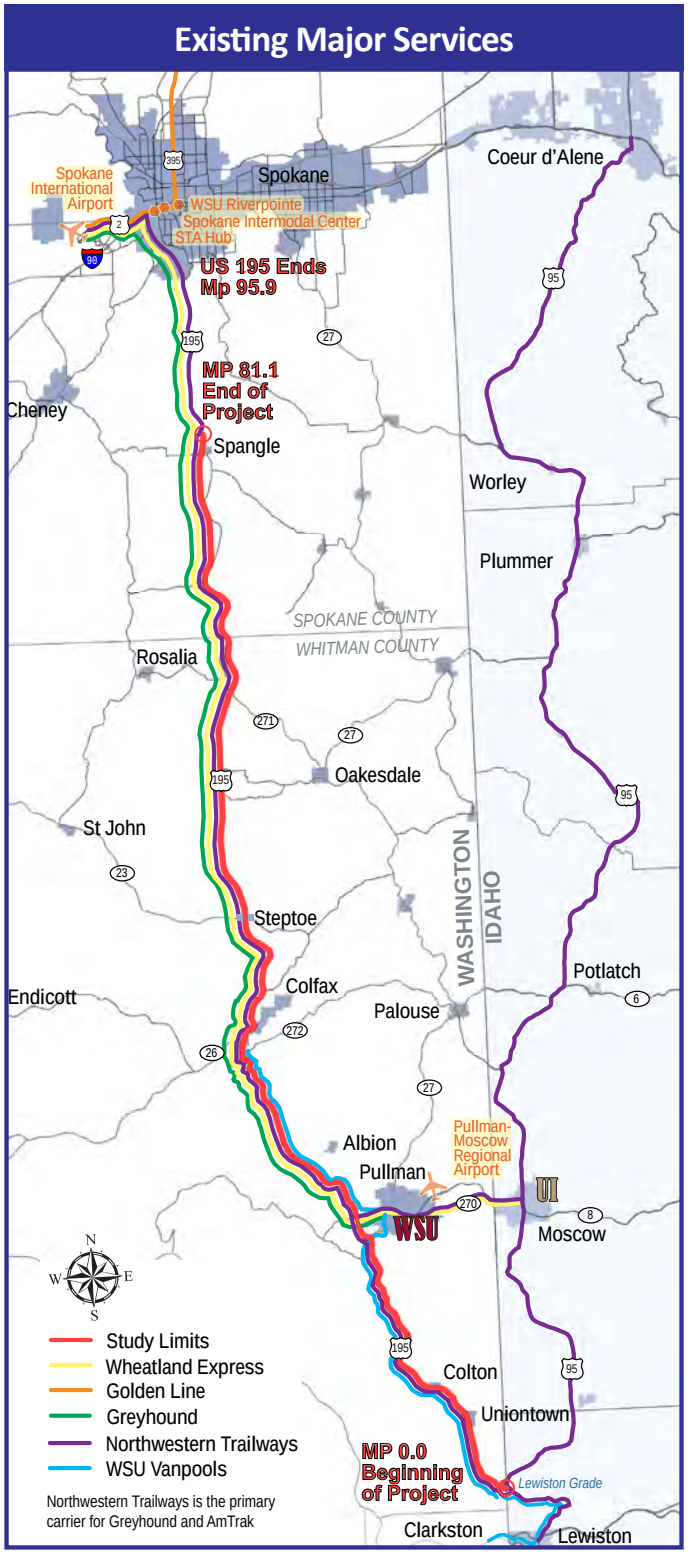
The following key elements are provided in a Coordinated Human Services Transportation Plan:

- An assessment of transportation needs for individuals with disabilities, older adults, youth, and persons with limited incomes.
- An inventory of available services that identifies areas of redundant service and gaps in service.
- Strategies to address the identified gaps in service.
- Identification of coordination actions to eliminate or reduce duplication in transportation services and strategies for more efficient utilization of resources.
- Prioritization of implementation strategies for transportation services.

Across the state, Coordinated Human Services Transportation Plans are developed by Metropolitan Planning Organizations (MPO) and Regional Transportation Planning Organizations (RTPO) and submitted to WSDOT as the basis for funding applications by the public transportation operators. In addition, a Human Services Transportation Coordination Plan also:

- Responds to federal planning requirements to access federal funds.
- Defines service needs for the elderly, persons with disabilities, and persons of low-income status, prioritizes potential strategies to address service deficiencies.

# Public Transportation




- Updates an inventory of human service transportation providers.
- Document needs for future efforts.

The US 195 Corridor study limits are primarily in Whitman County, a county served by the Palouse RTPO while a segment in Spokane County between Rosalia and Spangle lays within the Spokane Region Transportation Council (SRTC) RTPO regional planning limits.

As the US 195 corridor study limits are within two RTPOs, SRTC and Palouse, respective Coordinated Human Service Transportation Plans were reviewed as part of the evaluation of public transportation service and needs in the study area. A significant share of the corridor falls in the Palouse RTPO. The current SRTC Coordinated Human Services Plan focuses on public transportation in the Spokane metropolitan area.

## What were the Palouse RTPO Human Services Transportation Coordination Plan findings?

The Palouse RTPO Human Services Transportation Coordination Plan, completed in August 2010, found the following:

"All four counties [Asotin, Columbia, Garfield, and Whitman] are characterized by a population that has a higher proportion of seniors, people with a disability, and people living in poverty, compared to the

# Public Transportation

State of Washington. These are all groups that often have limited vehicle access and greater need for transportation services. Only 6.7% of all households in the four counties do not have access to a vehicle. However, a higher percentage of households with older residents do not have access to a vehicle, ranging from 8-16% in each county. The rural character of these counties makes it difficult for people to get places without a vehicle. Servicing the low density population is a distinct challenge for transportation service providers, who often must travel long distances to pick up and drop off single passengers."

**Palouse RTPO Human Services Transportation Coordination Plan, Pg. ES-1**

## What are the existing public transportation services?

There are several public transportation services available:

- Pullman Transit
- Wheatland Express (Operated by Starline Luxury Coaches)
- Northwestern Trailways
- Reliance Transport
- Alpha Omega Tours and Charters
- COAST Transportation
- Numerous Vanpool Services

**Pullman Transit** is a public transportation provider that operates only within the Pullman City limits, they provide:

- Eight fixed-route bus services on weekdays, including:
  - Six routes that run on 30 minute headway
  - Two express routes, that operate every 7 or 8 minutes
  - Service hours during the Washington State University school year are from 6:50 AM to 3:00 AM Monday through Friday
  - Saturdays, two routes are provided, from 9:00 AM to 3:00 AM
  - No service provided on Sundays
  - During the spring and winter breaks, when the university is not in session, service is offered with three routes from 6:50 AM to 5:50 PM, Monday through Friday, and with one route on Saturdays from 9:00 AM to midnight.
  - During the summer course sessions, from May to August, three routes are operated on a 30 minute headway from 6:50 AM to 6:00 PM. In 2009, the three routes were proved effective, but the overall ridership during the summer months declined by 21%.
- In addition to people with mobility limitations, anyone over 65 years old is eligible to use the ADA paratransit system. A Senior Shuttle service provides a deviated fixed-route paratransit service.
- Contracts services with the Pullman Public Schools, the Washington State University, and the public.

**Costs:** For the general public:

- One-way trip $0.50, monthly pass $10
- Senior, people disabilities, and youth (K-12) one-way trip $0.30, monthly pass $6
- WSU Students – free during all hours throughout the City of Pullman
- Semi-annual and annual passes can also be purchased.

*You can ride a Pullman Transit bus by simply showing your Cougar Card.*

# Public Transportation

Students rely on transit and Pullman Transit gives over 1.3 million rides per year. Funded in part by a student-initiated transit fee, Pullman Transit offers *Express Routes, transit* access to and from the Student Recreation Center, and other on-campus destination.

**Wheatland Express (Operarted by Starline Luxury Coaches)** is a privately owned charter bus operation. It provides:


- Two routes that make scheduled stops in Whitman County.
- Airport shuttle service to the Spokane International Airport once a day every day. On Fridays, the shuttle runs twice a day with scheduled stops in Moscow, Pullman and Colfax,
- Service from Pullman to Seattle during WSU break periods.

**Cost:** One-way to the Spokane International Airport is $45.

**Northwestern Trailways** serves the Inland Northwest inter-city routes. They provide:

- Two routes that make scheduled stops in Whitman County, traveling between Boise, Idaho and Spokane, Washington.
- In the Whitman County vicinity, the buses stop in Pullman and Colfax.
- Terminal facilities which are open for approximately one hour around the time of the scheduled stop and/or pickup.
- The limited schedule restricts same-day service to either of the terminal destinations.

**Costs:** $34 one-way and $64 round trip.

**Reliance Transport** is a privately owned charter and excursion business started by Washington State University students. They offer students and members of local communities an affordable and reliable means of transportation for Inland Northwest inter-city routes. They provide:

- A daily shuttle between Pullman and Moscow.
- Charters services in the Inland Northwest include Colfax, Lewiston, and surrounding areas.

**Costs:** $40 one-way to the Spokane International Airport and $5 one way/$8 round trip to Pullman and Moscow.

**Cougar Cruiser (Alpha Omega Tours & Charters)** is a professional tour and charter service in the Northwest. They provide charter service for "Cougar Cruiser" which provides transportation between Spokane and Pullman for WSU football games. They pick up and return riders the same day.
**Cost:** $30 round trip.

**COAST Transportation**
The Council of Aging Specialized Transit (COAST) serves eight counties in Washington and Idaho, including Whitman, Asotin, and Garfield counties in Washington. COAST is a designated Medicaid transportation broker of services, using a number of contracted and private human service providers. They provide non-Medicaid services, demand response services, one-on-one services and volunteer services along with:

- Bi-weekly service to select rural communities in both Washington and Idaho, enabling residents of very rural communities to access larger urban service centers.
- Demand response service, responding to individual rider reservations, if there are no reservations the van does not operate.
- Deviated-fixed route service, as the vans travel through smaller communities riders are picked up and transported to specific urban

destinations (e.g. Spokane).

- Multiple charter or taxi service. Once the scheduled van arrives in the urban service center, the van operates as a multiple charter or taxi, to meet the various rider transport needs — for example visiting a spouse in a nursing home, shopping for groceries, keeping a medical appointment, or lunching with friends at a downtown restaurant. Often, family, friends, or public transportation services provide part of the one-way trip to connect the rider with the van service. There is a fixed time to pick up riders in the origin community and a general target departure time from the urban center, but times can vary by an hour or more.
- Demand Response One-on-One Services — via agency vehicles and paid drivers; contracted providers and their drivers; and/or volunteers who drive their own cars. The typical hours of operation are 8:00 AM to 5:00 PM, Mondays through Fridays. However, services can be arranged earlier in the day or later in the evening and on weekends. Usually, these trips are provided by volunteers or contracted providers.
- Lease Vehicle Services — to various programs in Whitman County including the Community Child Care Center, Palouse Industries, and the YMCA.
- Support the Circuit Rider Program — COAST's use of state and federal special needs transportation funds for reimbursement and is a model for Washington State and FTA's "United We Ride" program. The Palouse River Counseling Service travels to outlying towns providing counseling services and travel expenses are reimbursed by COAST.

## What other vanpool services are available?

**Whitman County PTBA** — Operates a vanpool service in the unincorporated part of Whitman County, the Whitman County Unincorporated Public Transportation Benefit Area (PTBA) was established in September 2009, primarily to provide vanpool services in the unincorporated part of the county. In 2009, COAST was contracted to operate this vanpool service.

**Asotin County Public Transportation Benefit Area (PTBA)** — Provides fixed-route & dial-a-ride services in the cities of Asotin and Clarkston, and connects to Lewiston. They operate vanpools for two major employment centers in Pullman; Schweitzer Engineering Labs and Washington State University.

**WSU Pullman Parking and Transportation Services** — Coordinates vanpools from Colfax, Colton, Uniontown, and the Lewiston/Clarkston Valley.

**Whitman County Unincorporated Public Transportation Benefit Area** — Plans to provide vanpool services in the unincorporated part of the county along SR 27, connecting the cities of Pullman, Garfield, Palouse, Farmington and Oakesdale. Residents who live or work in these communities will be eligible to utilize the program.

# Public Transportation

The proposed fare rate is approximately $75 a month for a full-time rider traveling between Garfield and Pullman. The fare will be dependent on the number of days and distance traveled. Whitman County will also operate a Guaranteed Ride Home program, which will provide up to two emergency trips home per year without charge.

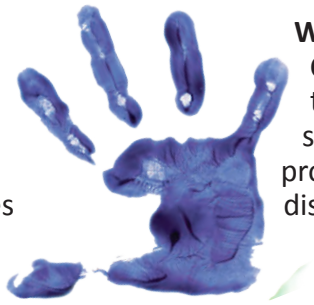
## What other private transportation providers are available?

Other Human Service Providers such as churches, hospitals, child care facilities, and retirement homes provide transport services with their privately owned vehicles.

**Palouse Industries & Early Learning Services** — Provides ADA accessible van service to their facilities including the Early Learning Services and Child Care programs. The service, based in Pullman also provides transportation for the Young Men's Christian Association (YMCA) after-school program. Palouse Industries makes 17,000 one-way trips a year, covering over 22,500 miles. Staff drivers transport 50 people a day to work sites and other destinations in Whitman County.

**Palouse River Counseling Center** — Operates a van to provide supportive transportation services to groups and individual clients.

**The Community Child Care Center** — Operates three fully accessible multi-function school activity vehicles for students.



**Building Blocks Day Care** — Operates van service for students.

**Sunnyside Pre-School** — Operates van service for students.

**The YMCA** — Leases a vehicle from COAST for summer programs and field trips.

**Senior Residential Facilities**
Four of Whitman County's skilled nursing and assisted living facilities operate accessible vehicles exclusively for their residents.

**Tekoa Care Center** — Provides two scheduled medical trips a week for residents.

**Palouse Hills Nursing Center** — Located in Pullman, typically provides three scheduled trips a week.

**Bishop Place** — Located in Pullman, provides van service several times a day for residents.

**Whitman Senior Living Community** — Operates a mini-bus for residents living in the senior apartment and/or assisted living facilities.

**Whitman County Schools** there are ten public school districts in Whitman County and two small private K-12 private schools. Each of the public school districts operate a fleet of buses.

**Whitman County Transition Council** supports the transition from secondary school to the workforce program for individuals with disabilities. The Pullman School District is the lead agency for the Council. In addition to the bus fleet, the Pullman District operates a seven passenger van in support of students with disabilities.

**WSU's Women's Transit** is operated by WSU Women's Center. Student volunteers operate three vehicles during evenings and weekend. Their objective is to provide safe, one-on-one transportation for women traveling alone when Pullman Transit is not in operation. A coordinator oversees 160 volunteer drivers. About 40% of those volunteers are returning, and 100 new volunteers are trained each semester. About 20% of the volunteers are male. The hours of operation are 6:00 PM to 12:00 AM, Sunday through Thursday. Hours are extended to 3:00 AM on Friday and Saturday nights. The system does not operate during WSU's summer break. The service averages approximately 5,100 riders per semester.

**Private Taxi or Van Services**

All Ways Transportation based in Lewiston uses a variety of vehicles to provide services throughout the region. It is a

COAST subcontractor.

There are several taxi companies, such as **Big Cat Taxi** and **A Top Notch Taxi**, serving Moscow/Pullman. Neither of these providers routinely operates later than midnight except on weekend nights. **A Good Taxi**, based in Pullman, operates two vehicles during the school year, and one during the summer months.

**Local Churches**

The **Nazarene Church** and the **Baptist Church** in Colfax, have van service.

**St John: Christian Life Assembly** in St. John, has van service.

**Calvary Christian Center** in Pullman, has a 30- passenger bus.

**Living Faith Fellowship** in Pullman, has a mid-size school bus.

**Hospitals**

Gritman Hospital located in Moscow, owns and operates a couple of vans that provide transportation for patients and employees, with an additional van planned for the near future. Gritman's vehicles operate on a demand response basis throughout Gritman's service area, which is primarily Latah County in Idaho. However, with that being said, they also transport Pullman area clients to the Adult Day Health program located at the hospital.

## How is the Commute Trip Reduction (CTR) program utilized in the area?

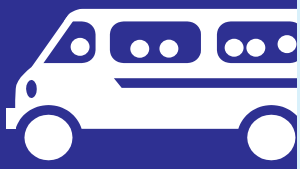
The Washington State Legislature passed the Commute Trip Reduction (CTR) Law in 1991. This law seeks to identify and establish commute alternatives that could reduce employee single-occupant vehicle use. It requires major employers in all Washington counties with population of over 150,000 to establish and implement CTR programs (RCW 70.94.521-527).

While the WSU Pullman campus is not required to establish a CTR program, university administrators have decided to voluntarily participate in CTR program. The Director of Parking, Transportation, and Visitor Center is the WSU Pullman CTR Coordinator. WSU Pullman is currently developing a new strategic matrix for CTR. No current goals or usage data is available at this time.

# Public Transportation

## What about Service Duplication?

***Due to the extensive length of the corridor (81 miles) and rural characteristics of the area, duplication of service did not emerge as a major issue for the region. If anything just the opposite is true, limited funding, low density population and established profitable transportation services routes distributed among several carries creates a unique challenge for new potential services.***



## What are the regional public transportation needs as identified in the Palouse RTPO?

The following presents region public transportation service needs as identified in the August 2010 Palouse RTPO Coordinated Human Services Transportation Plan (CHSTP).

**Extension or Expansion of Current Services** — to meet identified needs. Current public transportation service is limited in scope by constrained funding. The following offers ways to expand upon existing service to meet the transportation needs of the communities along the US 195 Corridor.

- Extension of Pullman Transit's routes in the summer months to meet the transportation need of senior citizens.
- Initiate a Get the Word Out Campaign about the availability of public transportation in all four counties (Asotin, Columbia, Garfield, and Whitman).
- Foster further coordination between public transportation and human service providers through ongoing communications and meetings.

**Establish New Services** — to meet identified needs. As per the Palouse Coordinated Human Services Transportation Plan, "each county has needs for new service, above and beyond what exists today. These vary by community characteristics and geographic boundaries and constraints." The following service opportunities were identified:

- Regularly scheduled evening and weekend service in all four counties. Some limited evening service exists in Garfield and Columbia Counties with Pullman Transit providing Saturday service.
- Elimination of regulatory restrictions between Washington and Idaho, to allow for interstate medical trips by public transportation.
- Daily transportation for jobs and services from outlying communities into Pullman.
- Medical transportation for those who do not qualify for ADA or Medicaid transportation in Asotin and Whitman Counties, which do not provide public dial-a-ride service, and in all counties for trips outside the Palouse region.

**Region Wide Needs** — transit service needs exist across all four counties:

- Sustain existing service.
- Ongoing coordination between transit and human service providers.
- Information sharing and promotion at both the local and regional level.
- Non-Medicaid long-distance medical trips.
- Transit connections outside of the region particularly into Idaho.

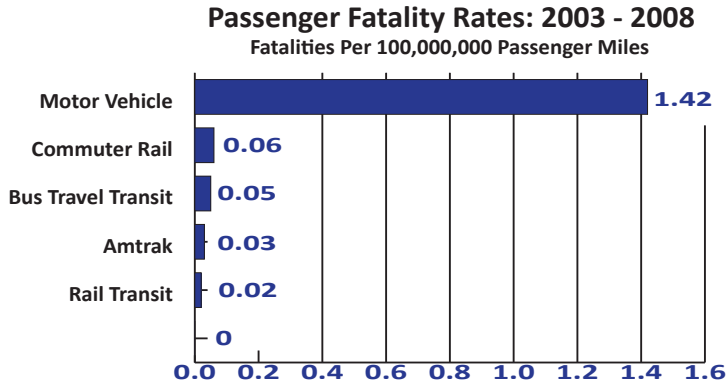
# Public Transportation

## Can improved public transportation services mitigate crashes along the US 195 Corridor?

Improved public transportation options along the US 195 Corridor potentially can help reduce crash risks by targeting services for populations that historically have been involved in fatal and serious crashes or have demonstrated (citation driven) "risky" behaviors while driving the corridor.

Rural roads tend to have a disproportionate higher rate of fatal vehicle crashes. As transit is among one of the safest ways to travel, expanded transportation services on US 195 does present an opportunity to reduce the number of serious injury crashes. Improved service including better connectivity, accessibility, frequency and affordability typically results in increased ridership and reduced numbers of people that drive alone, which should ultimately reduce crashes.

***"From 2003 to 2008 transit bus travel resulted in 0.05 deaths per 100 million passenger miles, compared to 1.42 deaths for motor vehicles." (American Public Transportation Association (APTA) Fact Book 2011, pg. 20).***




***Source: Federal Transit Administration/USDOT, 2009 Rail Safety Statistics Report, 2009***

American Public Transportation Association Fact Book 2011 Pg. 20

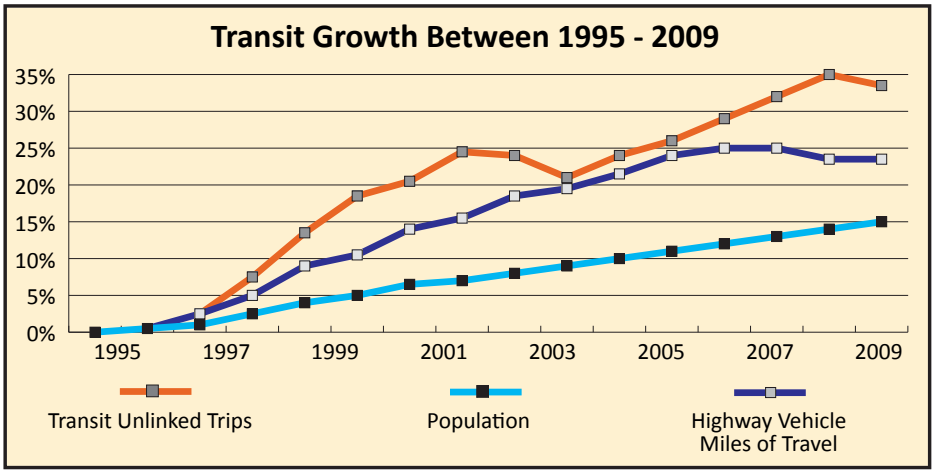
In a day 6,000 to 11,000 drivers commute along the US 195 Corridor to reach jobs, medical services, hospitals, airports, shopping centers, universities, and other metropolitan attractions in Spokane and Whitman County communities. The trip between the Palouse and Spokane is generally deemed "down the road to the south" or "up the road to the north". Current availability, frequency, and accessibility of public transportation services makes such trips typically dependent on the use of single occupancy vehicles. Providing public transportation to get people out of their single occupancy vehicles is a safety opportunity that represents one of many incremental steps to move us towards Washington State's Strategic Highway Safety Plan goal of zero deaths and serious injuries by the year 2030.

As the primary purpose of the CHSTP is to identify prioritized strategies that meet the specific needs of the local area's elderly, disabled or lower-income individuals, evaluation of improved public transportation services as a potential measure to reduce the severity and frequency of crashes is typically not addressed. During the development of the US 195 Corridor Study, as we gathered information from stakeholders, reviewed the public outreach survey responses, and analyzed crash citation data, improving public transportation services emerged as a potential measure to reduce crashes along the US 195 Corridor.

# Public Transportation

## What kind of growth in ridership is public transportation experiencing?

"Since 1995, transit has experienced sustained growth in ridership." Public transportation or public transit is shared passenger transport service which is available for use by the general public to include, but limited to: taxicabs, carpooling, vanpools, buses, light rail, train and ferryboat. "In 2009, transit systems carried passengers on 10.4 billion trips for a total of 55.2 billion passenger miles." "Public transportation ridership grew 34 percent from 1995 through 2009, more than twice the growth rate of the U.S. population (15 percent) and substantially more than the growth for vehicle miles of travel (VMT) on our nation's streets and highways (23 percent) over the same period. Population data are for United States residents population form the Bureau Census Statistical Abstract and VMT data retrieved from the Federal Highway Administration's monthly Traffic Volume Trends", (APTA 2011 Fact Book).




***Source: Bureau of Census Statistical Abstract and VMT data retrieved from the Federal Highway Administration's monthly Traffic Volume Trends***

American Public Transportation Association Fact Book 2011 Page 11

## Will commuters use public transportation?

Based on the annual American Community Survey the nationwide percentage of commuters using public transportation as their primary means of transportation has increased. "Nationwide the number of commuters on public transportation has increased from 5.98 million in 2004 to 6.92 million in 2009. The percentage of commuters using transit as their primary means of transportation to work rose from 4.57 percent in 2004 to 4.99 percent in 2009. Commuters who normally use another mode for work travel, but occasionally ride transit are not included in the data."

**Mode of Transportation by Age and County**

| Mean Transportation by Age | State of Washington | Asotin County | Columbia County | Garfield County | Whitman County | Spokane County |
|---|---|---|---|---|---|---|
| **Total** | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% |
| 16 to 19 | 3.8% | 4.4% | 3.6% | 5.3% | 7.1% | 4.7% |
| 20 to 24 | 9.7% | 8.9% | 4.8% | 5.6% | 26.3% | 12.0% |
| 25 to 44 | 44.4% | 40.9% | 31.8% | 27.3% | 35.2% | 41.1% |
| 45 to 54 | 23.8% | 25.3% | 29.5% | 23.4% | 17.4% | 23.8% |
| 55 to 59 | 9.4% | 11.0% | 14.4% | 15.7% | 6.4% | 9.2% |
| 60 to 64 | 5.6% | 5.6% | 11.6% | 13.8% | 4.0% | 5.9% |
| 65 and Over | 3.2% | 3.8% | 4.4% | 8.9% | 3.7% | 3.4% |

***Source: US. Census 2000 within the APTA 2011 Fact Book, Pg. 12, and 2006 - 2010 American Community Survey***

Mode of Transportation by Age and County

# Public Transportation

| Mode of Transportation by Age and County (Continued) | | | | | | |
|---|---|---|---|---|---|---|
| Mean Transportation by Age | State of Washington | Asotin County | Columbia County | Garfield County | Whitman County | Spokane County |
| **Drove Alone** (Car, Truck or Van) | 72.3% | 80.1% | 71.4% | 73.9% | 61.4% | 77.0% |
| 16 to 19 | 2.5% | 3.9% | 1.2% | 3.7% | 2.9% | 3.0% |
| 20 to 24 | 6.5% | 7.6% | 4.4% | 4.6% | 13.1% | 8.5% |
| 25 to 44 | 32.0% | 32.4% | 23.3% | 19.4% | 23.2% | 31.9% |
| 45 to 54 | 17.9% | 20.6% | 23.2% | 16.9% | 12.3% | 18.8% |
| 55 to 59 | 7.1% | 8.5% | 9.9% | 9.3% | 4.7% | 7.5% |
| 60 to 64 | 4.2% | 4.4% | 7.1% | 12.8% | 2.5% | 4.6% |
| 65 and Over | 2.3% | 2.8% | 2.2% | 7.3% | 2.7% | 2.6% |
| **Carpooled** (Car, Truck or Van) | 11.6% | 10.8% | 11.6% | 11.4% | 9.6% | 10.2% |
| 16 to 19 | 0.6% | 0.3% | 0.9% | 1.2% | 0.5% | 0.5% |
| 20 to 24 | 1.3% | 0.8% | 0.4% | 1.1% | 1.2% | 1.3% |
| 25 to 44 | 5.6% | 5.0% | 3.8% | 2.1% | 4.1% | 4.7% |
| 45 to 54 | 2.5% | 2.3% | 3.1% | 4.2% | 2.2% | 2.5% |
| 55 to 59 | 0.9% | 1.5% | 2.0% | 2.2% | 0.6% | 0.6% |
| 60 to 64 | 0.5% | 0.6% | 0.6% | 0.5% | 0.7% | 0.4% |
| 65 and Over | 0.2% | 0.5% | 0.6% | 0.1% | 0.2% | 0.2% |
| **Public Transportation** (Excluding Taxicabs) | 5.6% | 1.1% | 0.5% | 0.0% | 5.9% | 2.9% |
| 16 to 19 | 0.2% | 0.0% | 0.5% | 0.0% | 0.0% | 0.3% |
| 20 to 24 | 0.7% | 0.1% | 0.0% | 0.0% | 2.1% | 0.5% |
| 25 to 44 | 2.6% | 0.2% | 0.0% | 0.0% | 3.4% | 1.0% |
| 45 to 54 | 1.1% | 0.6% | 0.0% | 0.0% | 0.1% | 0.5% |
| 55 to 59 | 0.5% | 0.0% | 0.0% | 0.0% | 0.2% | 0.2% |
| 60 to 64 | 0.3% | 0.0% | 0.0% | 0.0% | 0.1% | 0.2% |
| 65 and Over | 0.1% | 0.1% | 0.0% | 0.0% | 0.0% | 0.1% |
| **Walked** (Commuters) | 3.5% | 4.5% | 8.7% | 4.8% | 16.3% | 2.9% |
| 16 to 19 | 0.4% | 0.3% | 0.9% | 0.4% | 2.9% | 0.5% |
| 20 to 24 | 0.7% | 0.3% | 0.0% | 0.0% | 8.1% | 0.7% |
| 25 to 44 | 1.3% | 1.9% | 1.6% | 1.5% | 2.4% | 0.9% |
| 45 to 54 | 0.6% | 1.2% | 2.2% | 2.3% | 1.9% | 0.4% |
| 55 to 59 | 0.2% | 0.4% | 1.6% | 0.4% | 0.5% | 0.1% |
| 60 to 64 | 0.2% | 0.2% | 1.9% | 0.2% | 0.3% | 0.1% |
| 65 and Over | 0.1% | 0.2% | 0.5% | 0.0% | 0.3% | 0.1% |

***Source: US. Census 2000 within the APTA 2011 Fact Book, Pg. 12, and 2006 - 2010 American Community Survey***
Mode of Transportation by Age and County

# Public Transportation

*"The rural character of Asotin, Columbia, Garfield, and Whitman counties makes it difficult for people to get places without a vehicle. Servicing the low density population is a distinct challenge for transportation service providers, who often must travel long distances to pick up and drop off single passengers".*

*Source: Palouse RTPO Human Services Coordination Transportation Plan, August 2010.*

| Means of Transportation by Age and Rural Town or City | | | | | | |
|---|---|---|---|---|---|---|
| Age | State of Wash. | City of Asotin | City of Clarkston | City of Colfax | Town of Colton | Town of Oakesdale |
| **Total** | 100% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% |
| 16 to 24 | 13.6% | 9.6% | 14.7% | 9.2% | 4.9% | 6.5% |
| 25 to 64 | 83.2% | 85.5% | 82.3% | 83.5% | 89.3% | 81.0% |
| 65 and Over | 3.2% | 4.9% | 3.0% | 7.3% | 5.7% | 12.4% |
| **Drove Alone** (Car, Truck, or Van) | 72.3% | 83.7% | 77.0% | 77.8% | 90.2% | 79.7% |
| 16 to 24 | 8.9% | 6.2% | 11.8% | 5.7% | 4.9% | 4.6% |
| 25 to 64 | 61.1% | 72.5% | 62.9% | 66.3% | 79.5% | 63.4% |
| 65 and Over | 2.3% | 4.9% | 2.3% | 5.8% | 5.7% | 11.8% |
| **Carpooled** (Car, Truck, or Van) | 11.6% | 5.7% | 8.9% | 14.7% | 6.6% | 8.5% |
| 16 to 24 | 1.9% | 0.0% | 1.1% | 1.7% | 0.0% | 2.0% |
| 25 to 64 | 9.4% | 5.7% | 7.7% | 12.1% | 6.6% | 5.9% |
| 65 and Over | 0.2% | 0.0% | 0.0% | 0.8% | 0.0% | 0.7% |
| **Public Transportation** (Excluding Taxicab) | 5.6% | 0.0% | 2.6% | 0.0% | 0.0% | 0.0% |
| 16 to 24 | 1.0% | 0.0% | 0.4% | 0.0% | 0.0% | 0.0% |
| 25 to 64 | 4.5% | 0.0% | 2.0% | 0.0% | 0.0% | 0.0% |
| 65 and Over | 0.1% | 0.0% | 0.2% | 0.0% | 0.0% | 0.0% |
| **Walked** (Commuter) | 3.5% | 6.7% | 8.1% | 6.2% | 1.6% | 3.9% |
| 16 to 24 | 1.1% | 3.4% | 1.3% | 1.8% | 0.0% | 0.0% |
| 25 to 64 | 2.2% | 3.4% | 6.4% | 3.8% | 1.6% | 3.9% |
| 65 and Over | 0.1% | 0.0% | 0.4% | 0.6% | 0.0% | 0.0% |
| **Other Means** (Taxicab, Motorcycle, Bicycle) | 2.0% | 1.0% | 0.7% | 1.3% | 1.6% | 1.3% |
| 16 to 24 | 0.3% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| 25 to 64 | 1.7% | 1.0% | 0.7% | 1.3% | 1.6% | 1.3% |
| 65 and Over | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| **Worked from Home** | 5.1% | 2.8% | 2.7% | 0.0% | 0.0% | 6.5% |
| 16 to 24 | 0.4% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| 25 to 64 | 4.3% | 2.8% | 2.7% | 0.0% | 0.0% | 6.5% |
| 65 and Over | 0.4% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |

***Source: US. Census 2000 within the APTA 2011 Fact Book, Pg. 12, and 2006 - 2010 American Community Survey***

Mode of Transportation by Age and Rural Town or City

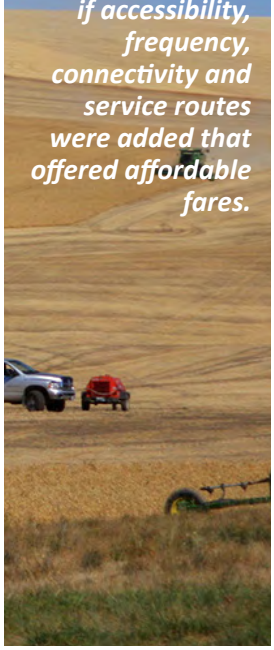
# Public Transportation

| Means of Transportation by Age and Rural Town or City (Continued) | | | | | | |
|---|---|---|---|---|---|---|
| Age | State of Wash. | City of Palouse | City of Pullman | Town of Rosalia | City of Spangle | City of Tekoa |
| **Total** | 100% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% |
| 16 to 24 | 13.6% | 13.4% | 46.6% | 10.7% | 14.8% | 4.4% |
| 25 to 64 | 83.2% | 83.0% | 51.1% | 88.5% | 80.2% | 90.7% |
| 65 and Over | 3.2% | 3.6% | 2.2% | 0.8% | 4.9% | 4.9% |
| **Drove Alone** (Car, Truck, or Van) | 72.3% | 70.0% | 54.3% | 77.4% | 74.1% | 70.6% |
| 16 to 24 | 8.9% | 11.3% | 21.5% | 6.9% | 14.8% | 0.0% |
| 25 to 64 | 61.1% | 56.7% | 31.2% | 69.7% | 54.3% | 65.7% |
| 65 and Over | 2.3% | 1.9% | 1.6% | 0.8% | 4.9% | 4.9% |
| **Carpooled** (Car, Truck, or Van) | 11.6% | 16.6% | 8.6% | 9.2% | 14.8% | 13.7% |
| 16 to 24 | 1.9% | 0.0% | 2.1% | 0.8% | 0.0% | 0.0% |
| 25 to 64 | 9.4% | 16.6% | 6.3% | 8.4% | 14.8% | 13.7% |
| 65 and Over | 0.2% | 0.0% | 0.2% | 0.0% | 0.0% | 0.0% |
| **Public Transportation** (Excluding Taxicab) | 5.6% | 0.0% | 8.8% | 0.0% | 0.0% | 0.0% |
| 16 to 24 | 1.0% | 0.0% | 3.1% | 0.0% | 0.0% | 0.0% |
| 25 to 64 | 4.5% | 0.0% | 5.7% | 0.0% | 0.0% | 0.0% |
| 65 and Over | 0.1% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| **Walked** (Commuter) | 3.5% | 7.1% | 21.5% | 7.7% | 11.1% | 5.2% |
| 16 to 24 | 1.1% | 1.7% | 16.1% | 0.0% | 0.0% | 4.4% |
| 25 to 64 | 2.2% | 5.5% | 5.1% | 7.7% | 11.1% | 0.9% |
| 65 and Over | 0.1% | 0.0% | 0.3% | 0.0% | 0.0% | 0.0% |
| **Other Means** (Taxicab, Motorcycle, Bicycle) | 2.0% | 2.7% | 2.6% | 0.0% | 0.0% | 7.8% |
| 16 to 24 | 0.3% | 0.4% | 1.6% | 0.0% | 0.0% | 0.0% |
| 25 to 64 | 1.7% | 2.3% | 1.0% | 0.0% | 0.0% | 7.8% |
| 65 and Over | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| **Worked from Home** | 5.1% | 3.6% | 4.1% | 5.7% | 0.0% | 2.6% |
| 16 to 24 | 0.4% | 0.0% | 2.3% | 3.1% | 0.0% | 0.0% |
| 25 to 64 | 4.3% | 1.9% | 1.7% | 2.7% | 0.0% | 2.6% |
| 65 and Over | 0.4% | 1.7% | 0.1% | 0.0% | 0.0% | 0.0% |

***Source: US. Census 2000 within the APTA 2011 Fact Book, Pg. 12, and 2006 - 2010 American Community Survey***

Mode of Transportation by Age and Rural Town or City (Continued)

***The City of Pullman has the highest public transportation ridership at (8.8%), which exceeds the statewide public transportation usage of 5.6%, as illustrated on the adjacent table. It is recognized that this ridership percentage is due to the high usage of service by the WSU student population. Nonetheless, the data indicates a potential for increased public transportation usage in this service area and other possible sections of the US 195 Corridor, if accessibility, frequency, connectivity and service routes were added that offered affordable fares.***



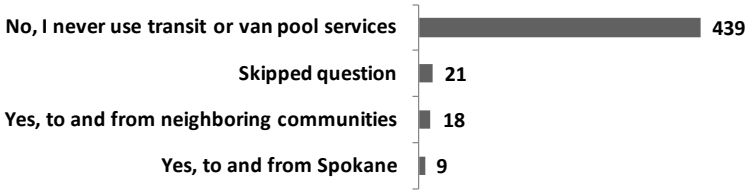
# Public Transportation

## What did the results of the public outreach survey reveal about regional public transportation?

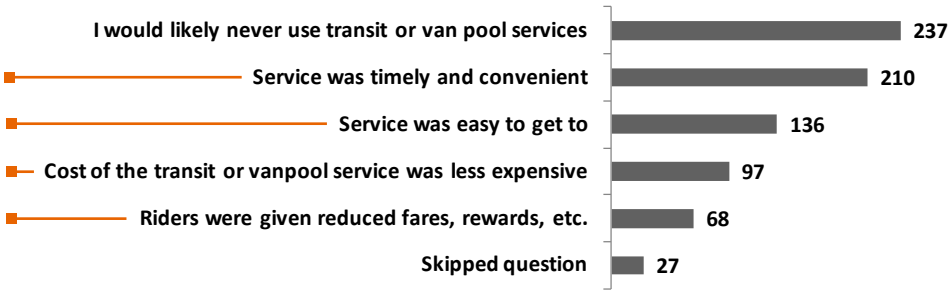
As part of the US 195 Corridor Study a public outreach survey was conducted to provide insight into the needs of the local communities. The survey completed by US 195 drivers from local towns, cities and the universities in the vicinity of the corridor. Nearly 500 individuals completed the survey. Several questions focused on regional public transportation issues, to help us assess where commuters are going, what mode of transportation they are using to get there, and to identify opportunities to improve public transportation.

The public survey results showed there is a potential need and opportunity to improve public transportation and increase ridership if a few criteria could be met, such as: increasing accessibility, frequency, making fares affordable, initiating incentive programs and adding connectivity to existing service routes. The survey feedback illustrates that there are opportunities available to reduce daily trips along US 195, by improving, utilizing and expanding regional public transportation and access. That being said, any increase of public transportation coordination, services and access along US 195 would need to be evaluated in the upcoming Palouse RTPO Human Services Transportation Coordination Plan.

**15 DO YOU CURRENTLY USE A TRANSIT OR VAN POOL SERVICE?**




**16 WOULD YOU CONSIDER COMMUTING TO NEIGHBORING COMMUNITIES BY TRANSIT OR VAN POOL IF THE ...**




Note: Question 16 allowed more than one answer. About 500 people participated in the survey.
Source: US 195 Corridor Public Outreach Survey 2011

## What public transportation goals and strategies did the 2007 Palouse Coordinated Human Services Public Transportation Plan identify?

The goals of the Palouse RTPO's Human Services Transportation Coordination Plan are to prioritize strategies that meet the needs of the local area's elderly, persons with disabilities, and persons of lower-income, updating service provider inventory, documenting needs for future efforts, and securing and meeting funding requirements.

Evaluation of improved public transportation services as a potential countermeasure to reduce disabling and fatal injury crashes is not currently addressed as part of Palouse RTPO's Human Services Transportation Coordination Plan.

The 2007 Plan identified the following opportunities to improve public transportation.

| Organization | Project Name | Project Description | Strategy Addressed | Expected Outcomes |
|---|---|---|---|---|
| **A Projects** | | | | |
| Columbia County Public Transportation | Operating Grant | Operating funds to sustain existing demand response service | Maintain existing service levels to ensure stable transit service | CCPT will continue operation of existing transportation services |
| Garfield County Transit | Operating Grant | Operating assistance forsustaining Garfield County Transit's existing services and restoring previous service levels | Maintain existing service levels to ensure stable transit service. Restore previous levels of service | GCT will continue operation of existing transportation services |
| City of Pullman/ Pullman Transit | Operating Grant | Operating assistance for sustaining the City of Pullman's transit division's existing fixed-route service within Pullman | Maintain existing service levels to ensure stable transit service | City of Pullman will continue to operate fixed route service at current levels |
| COAST | Operating Grant | Operating assistance for sustaining COAST's existing services | Maintain existing service levels to ensure stable transit service | COAST will continue to operate transit service at current levels |
| **B Projects** | | | | |
| Asotin County PTBA | Vehicle Grant | One ADA Compliant Cutaway Vehicle – replacement vehicle | Maintain existing service levels to nsure stable transit service | Asotin County PTBA will continue to operate fixed route service at current levels |
| COAST | Vehicle Grant | One ADA Compliant Cutaway Vehicle – replacement vehicle | Continue operation of existing transportation services | COAST will continue operation of existing transportation services |
| Garfield County Transit | Service Expansion Grant | Provide additional 1,300 hrs. of local service | Extend local service hours to 5:00 pm Monday through Friday | Expansion of weekday service to 5:00 pm. |
| Columbia County Public Transportation | Vehicle Grant | Capital assistance to replace two demand response cutaway buses | Replace vehicles as needed to ensure service continuity | CCPT will continue operation of existing transportation services |
| **C Projects** | | | | |
| Garfield County Transit | Technology Improvement Grant | Provide security cameras and DVR systems for all GCT vehicles | Improve technology to increase safety and increase efficiency data collection | Increase in safety monitoring and the accuracy of data collection. |
| Palouse RTPO | Mobility Manager Grant | Mobility Management parttime position | Implement a mobility manager program to coordinate services | Greater coordination of services and planning, as well as additional support for each transit system. |

Source: Human Services Transportation Coordination Plan, Final Report November, 2014 - Table 6-1: Palouse RTPO Regional Funding Priorities for WSDOT Funding Palouse Regional Transportat, ion Planning Organization

# Public Transportation

## What is the correlation between safety and public transportation?

Improved public transportation on the US 195 Corrridor provides an opportunity to address safety on the corridor. Offering public transportation as an alternative mode to single occupancy vehicles usage provides a flexible, safer alternative to driving a car. Currently, transit is one of the safest modes of travel per passenger-mile traveled, according to the National Safety Council. Passengers using public transportation systems are 40 times less likely to be involved in a fatal accident, and 10 times less likely to be involved in an accident resulting in injury.

**US 195 Crash Demographic Safety Correlation**

| Age | Contributing Vehicle | | | | Crash Involvement | | Fatal Occurrence |
|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | Total | % | |
| 16-19 | 103 | 27 | 4 | 0 | 134 | 13% | 0 |
| 20-24 | 174 | 30 | 7 | 0 | 211 | 21% | 5 |
| 25-44 | 246 | 77 | 6 | 1 | 330 | 32% | 5 |
| 45-54 | 103 | 40 | 4 | 0 | 147 | 14% | 2 |
| 55-59 | 48 | 27 | 0 | 0 | 75 | 7% | 2 |
| 60-64 | 24 | 17 | 1 | 0 | 42 | 4% | 0 |
| 65+ | 55 | 27 | 0 | 1 | 83 | 8% | 3 |
| Male | 452 | 170 | 17 | 2 | 641 | 63% | |
| Female | 293 | 81 | 5 | 0 | 379 | 37% | |

***Source: WSDOT's Statewide Travel and Crash Data Office, 2005 to 2009.***

US 195 Crash Demographic Safety Correlation

As illustrated on the adjacent chart, demographic characteristics such as age and sex have been identified as risk factors associated with crashes along the US 195 Corridor. If we could persuade this high risk demographic groups to use public transportation, the frequency of crashes could potentially be reduced. The data used for this table was obtained from the public outreach questionnaire survey.

## Where do we start the discussion on how to increase ridership of public transportation on the corridor?

We can start by bringing together local transportation service providers, government agencies, businesses, and the public to look for ways to leverage our limited resources and to make public transportation options more available, accessible, connective, frequent and affordable.

# Public Transportation

## What potential public transportation improvements have been identified?

The following is a list of initial ideas developed during this corridor study or as part of the Coordinated Human Services Transportation Plan.

**Consumer Information:**

- Increase and improve web-based public transportation service information, (e.g. WSDOT Regional Commute & Travel Information website).
- Promote ridership by broadening exposure to transit opportunities.
- Develop a regional access guide with transit options and connective services that are web based and interactive to facilitate easier planning of regional trips.
- Provide online tools that allow rural transit systems to better share route and schedule information, (e.g. Google's existing transit map service).

**Marketing:**

- Promote transit ridership to the public through printed and social media technologies.
- Use local radio stations such as University of Idaho's KUOI, Washington State University's KZUU, and other local broadcasters to promote transit service.
- Use websites and smart phone technologies to share transit route and schedule information with the public.

**Affordability:**

- Subsidize services through State and Federal grant programs.
- Reduce fares and offer discounts such as lower rates for off-peak travel times or for certain groups of travelers, such as young and older individuals, persons with disabilities, or those with lower-incomes.
- Support the development of a Universal Bus Pass Program which would provide rides at reduced rates, and offer incentives to larger employers to participate.
- Explore the feasibility and benefits of more convenient fare structures and payment systems using electronic "smart cards."

**Coordination:**

- Expand coordination between human service agencies and transit providers.
- Improve or increase connections between regional public transportation and the City of Pullman, enticing WSU students attending classes in Spokane at the Riverpoint Campus to participate.
- Connect Pullman Transit to Wheatland Express. Currently there are several Pullman Transit loops that come within one mile of the Wheatland Express depot, by providing a connection point travelers' access would be improved.
- Connect Pullman Transit to the Northwestern Trailways/Amtrak. Currently Pullman Transit has three bus stops that stop within 100 yards of the Northwestern Trailways/Amtrak depot, by providing a connection point travelers' access would be improved.

**Infrastructure:**

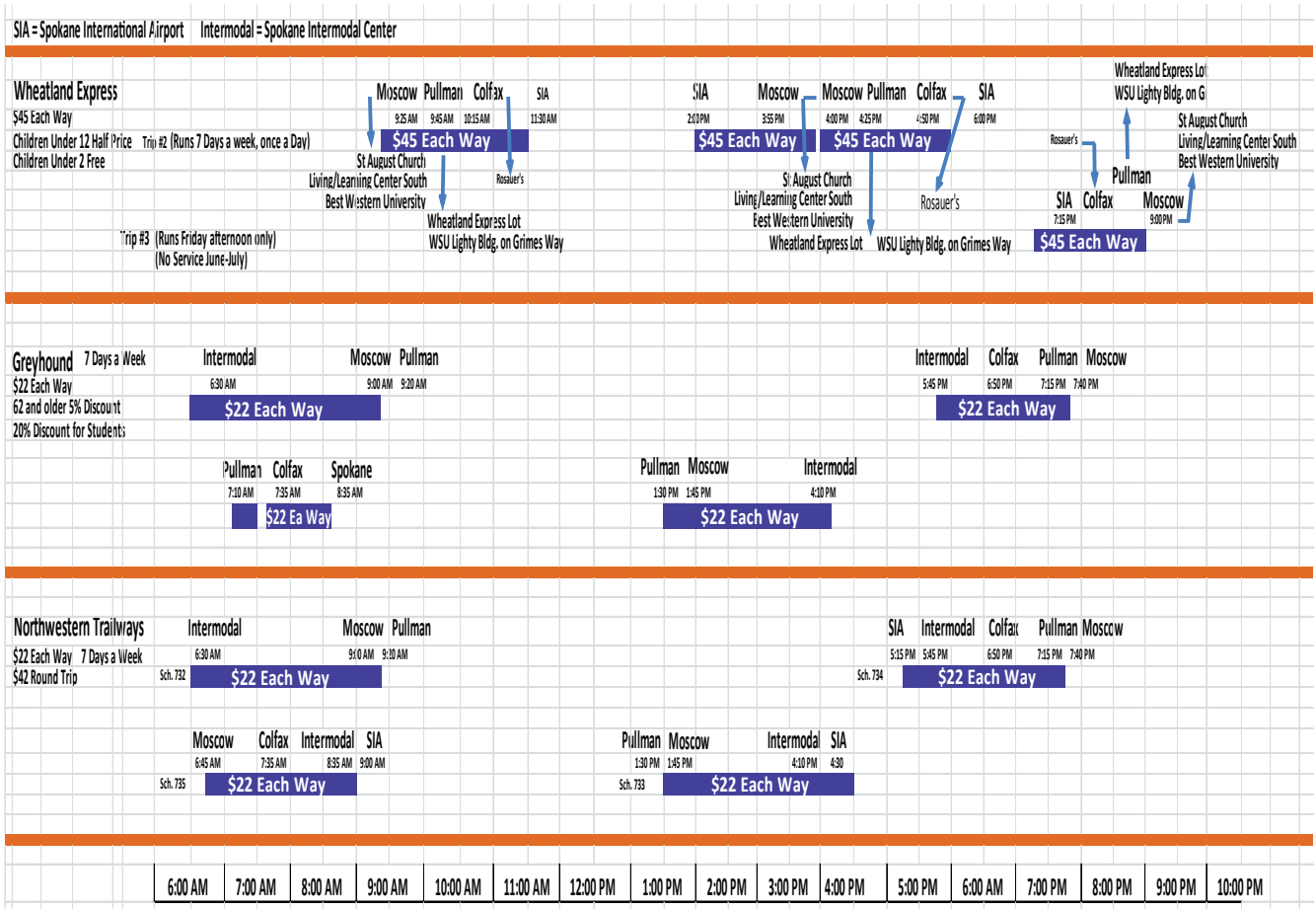
- Increase or improve passenger waiting areas including bus shelters. If riders feel safe and are comfortable they are more likely to use public transportation.
- Extend the existing Gold Line Statewide Intercity Bus Network to Pullman. Currently Gold Line provides transit service between Kettle Falls and Spokane. Expanding to the communities of Rosalia, Spangle and Steptoe will connect these towns to existing regional public transportation routes.

# Public Transportation


## Is it feasible to expand Gold Line transit services south to US 195?

Currently Gold Line serves the US 395 Corridor, connecting Colville, Arden, Addy, Chewelah, Loon Lake and Deer Park to Spokane. Wheatland Express, Greyhound and Northwestern Trailways operate routes on US 195 from Moscow and Pullman to Colfax, and to the Spokane's Intermodal Center and the International Airport. However, their service hours leave gaps in coverage during late morning and late afternoon hours for the communities of Rosalia, Steptoe, and Spangle which could possibly be filled by Gold Line. Further study and possibly a community survey of public transportation users may be needed to determine if expanding service to these communities is feasible and profitable.

### US 195 Regional Transit Schedule (2012)




US 195 Regional Transit Schedule (2012)