

**Data Driven Planning for Tribal
Traffic Safety
2016 Washington Tribal-State
Transportation Conference
R. Rolland, D. Winchell, M. Hill**

Critical Needs for Tribal Traffic Safety

- American Indians suffer far more from motor vehicle related deaths and injuries than would be expected, given their proportion of the population.
- In general, Native Americans have the highest risk of motor vehicle related deaths of all ethnic groups.
- Motor vehicle crashes are the leading cause of death for Native Americans ages 4 to 44.
- Beyond motor vehicle deaths, other transportation modes such as maritime travel or snow machine use contribute significantly to the transportation safety problem in many tribal communities.

Source: Tribal Transportation Program Delivery Guide. (2013). A Manual for FHWA Program Agreement Tribes.

Tribal Transportation Safety Planning

- Tribal Transportation Safety Plans are a tool intended to identify and address those risk factors within a geographical area that are associated with transportation and have a potential of leading to serious injury or death.
- Safety Plans also organize the efforts of a variety of entities to more effectively reduce risk.
- Safety Plans can cover multiple transportation modes (roads, maritime, trails, air travel, and others).
- Safety plans may lead to implementation of a project or program, renewed efforts in an existing program, or further study of a roadway section (such as an engineering study or Road Safety Audit).

Data Driven Traffic Safety Planning



There are a total of 202 elements that comprise the MIRE listing. These elements are divided among three broad categories: roadway segments, roadway alignment, and roadway junctions. Examples of the MIRE data elements:

Roadway classification

Paved surface characteristics

Number and type of travel lanes

Shoulder, median, and roadside descriptors

Curve and grade information

Traffic control devices

Intersection features

Interchange and ramp descriptors

Pedestrian and bicyclist facilities

Traffic volumes

Use the listing on the left to view detailed descriptions of the data elements.

A full listing of the MIRE elements is in the [MIRE Version 1.0](#).

Data Elements (expanded)

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- Traffic control devices
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- Interchange and ramp descriptors
- Pedestrian and bicyclist facilities
- Traffic volumes
- Use the listing on the left to view detailed descriptions of the data elements.
- A full listing of the MIRE elements is in the [MIRE Version 1.0](#).

Data Elements for Safety (Expanded)

Supplemental Databases

- The elements in MIRE are envisioned as the elements to be included in agencies' roadway and traffic inventories. However, MIRE does not contain all inventory data needed for all safety decisions. The composition of MIRE was purposefully designed to link with supplemental databases including:
 - Roadside fixed objects
 - Signs
 - Speed data
 - Automated enforcement devices
 - Land use elements related to safety
 - Bridge descriptors
 - Railroad grade-crossing descriptors
 - Safety improvements

Safety Data if for Key Staff, Programs, Tribal Leaders, and the Community

Identify Safety Partners

- Approaching safety using a collaborative approach across many disciplines is proven as an effective strategy for safety planning. Some initial safety partnerships to consider are with administration (such as Tribal Council), enforcement, emergency medical services (fire, search and rescue, clinics), educators, behavioral specialists, engineers, planners, community special interest groups, and in some cases the public. Where appropriate, partnerships should seek to include the Tribe, City, County, State, and/or federal agencies.

When making initial contact on the topic of developing safety plans, the following topics may be discussed:

- Is the partner interested in a comprehensive transportation safety plan?
- What data sources does the partner know about or maintain?
- Are there additional agencies that this partner would recommend which you have not identified?
- Would this partner commit to attending a community safety summit?

Public Involvement (Education)

- Public Input can be a critical element of identifying safety needs. Often the traveling public can point to near misses or unreported incidents that would never show up in traditional data sets.
- Public input is an especially critical tool in communities where formal data sets are known to be incomplete or missing.
- Dot Map/Sticky Notes at public events—
Identify critical traffic issues on a map.

Finding, Organizing, and Reporting Data as the Basis for Strategies

Data Collection and Summarization

- Communities that have successfully used transportation safety plans in the past usually point to data based decision making as the key to success.
- Preparing a summary of the available data prior to a safety planning meeting with the partners allows the summit to be fact based more than opinion based.
- A summary of incident data should consider both behavioral factors (speeding, impairment, age, etc.) and tangible factors (location, road feature, weather conditions, crash type, etc.)

Data Sources: Complex and Diverse

Data Exists across many Departments

- Incident data always exists. In some communities incident data may look very different than in others. Some potential sources of incident data include:
 - Formal police crash reports or incident reports
 - Ambulance run reports, clinic records, or search & rescue logs
 - Tribal City/county complaint registers
 - Public input

Safety Planning Target Zero Tribal Safety Committee (and forums)

Many Tribes have Safety Committees, but these need to be given priority by Council and Community.

A Safety Planning Forum gives identified partners a chance to collaboratively develop a safety plan. The forum should include the following topics:

- Review Existing Efforts
- Summary of Available Data
- Identify top risks
- Assign champion to each top risk. Task champion with researching countermeasures and leading implementation.
- Discuss the establishment of a regular safety management system committee to discuss progress and update the plan as needed.

The Tribal Safety Plan/Strategic Plan

- The final safety plan document should include a summary of the safety plan development process used, a list of the top risks identified and priority initiatives to address the top risks.
- ?FHWA FLH TTP SMS website,
<http://flh.fhwa.dot.gov/programs/ttp/safety/>

Safety Plan Outline

The following is a sample outline of topics that may be included in the safety plan.

- A. Introduction describing the intent of the plan
- B. List of partners
- C. Brief summary of data analysis
- D. Existing Activities
- E. Top Risk Areas (a.k.a. Emphasis Areas)
 - a. Description of Risk
 - b. Strategies to address risk
 - c. Safety Champion overseeing implementation
 - d. Next step(s) in implementation

Resources for Data Driven Planning

- **References and Resources**
- Developing Safety Plans – A Manual for Local Rural Road Owners, FHWA, March 2012, http://safety.fhwa.dot.gov/local_rural/training/fhwas12017/
- TTAP Centers, <http://www.itap.org/centers/>
- Sample Completed Tribal Safety Plans, <http://flh.fhwa.dot.gov/programs/irr/safety/sms.htm#plans>

Data Driven Traffic Safety Planning Process

Inventory

- Data collected and reported by Police Officers through Incident Reports
- Data collection of incident reports for tribal, state, national FARS Data Systems.
- Other Data collection uses alternate sources: CDC uses coroner reports.

Analysis

- Location of Crashes (GIS Locations, mapped and assessed)
- Contributing Factors (FARS Data Reporting, Other)

Strategic Traffic Safety Plans/Actions

- Target Zero analysis of contributing factors lead to action
- Community-based strategies developed and implemented

Engineering--Data Driven Planning Tribal Traffic Safety

Crash Data Collection, Inventory and Analysis/Systematic Analysis

- Identify Crash Locations
- Identify Contributing Factors and Prioritize
- SYSTEMATIC APPROACH—Identify Traffic Crash trends and potential areas of concern.

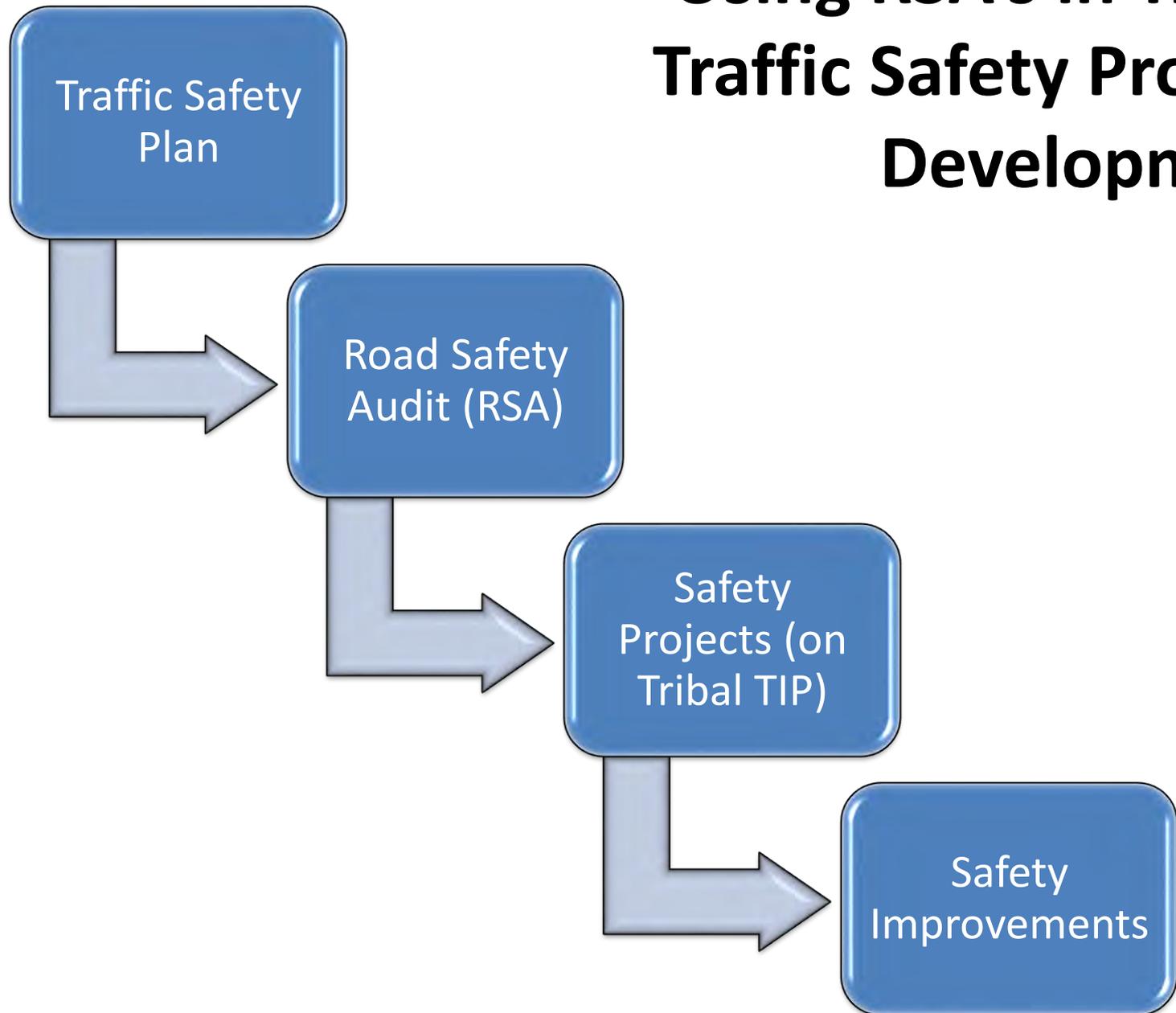
Road Safety Audits/Road Safety Assessments

- Team including Engineers complete formal Road Safety Audit (RSA) and develop traffic safety improvement projects.
- Less formal Road Safety Assessment as the basis for traffic safety improvement projects.

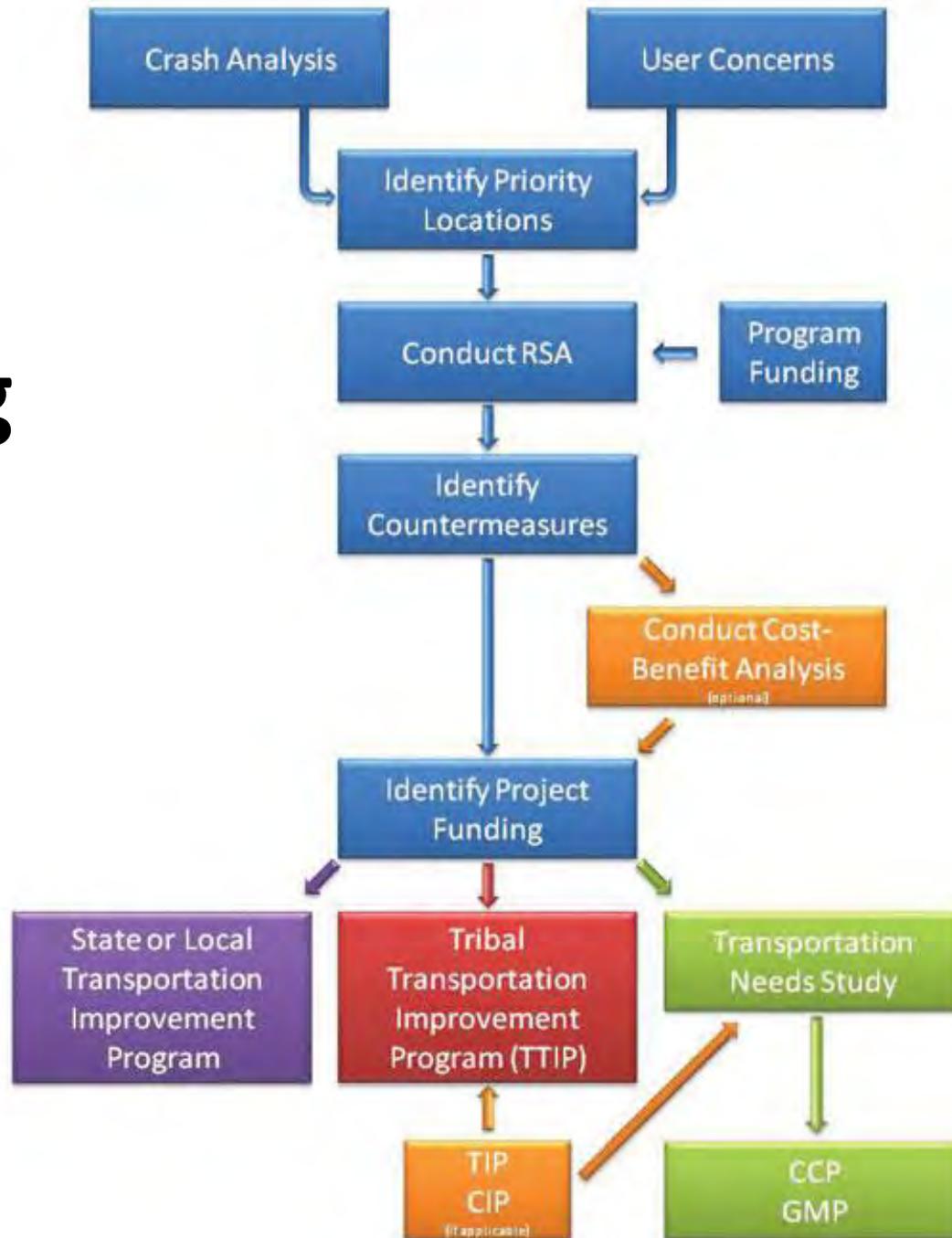
Nine Cost-Effective Countermeasures for Traffic Safety Improvements

- Review nine countermeasures and their potential application in terms of crash data analysis and road safety assessment.
- Design and develop traffic safety improvement projects

Using RSA's in Tribal Traffic Safety Project Development



RSA's in the Planning Process

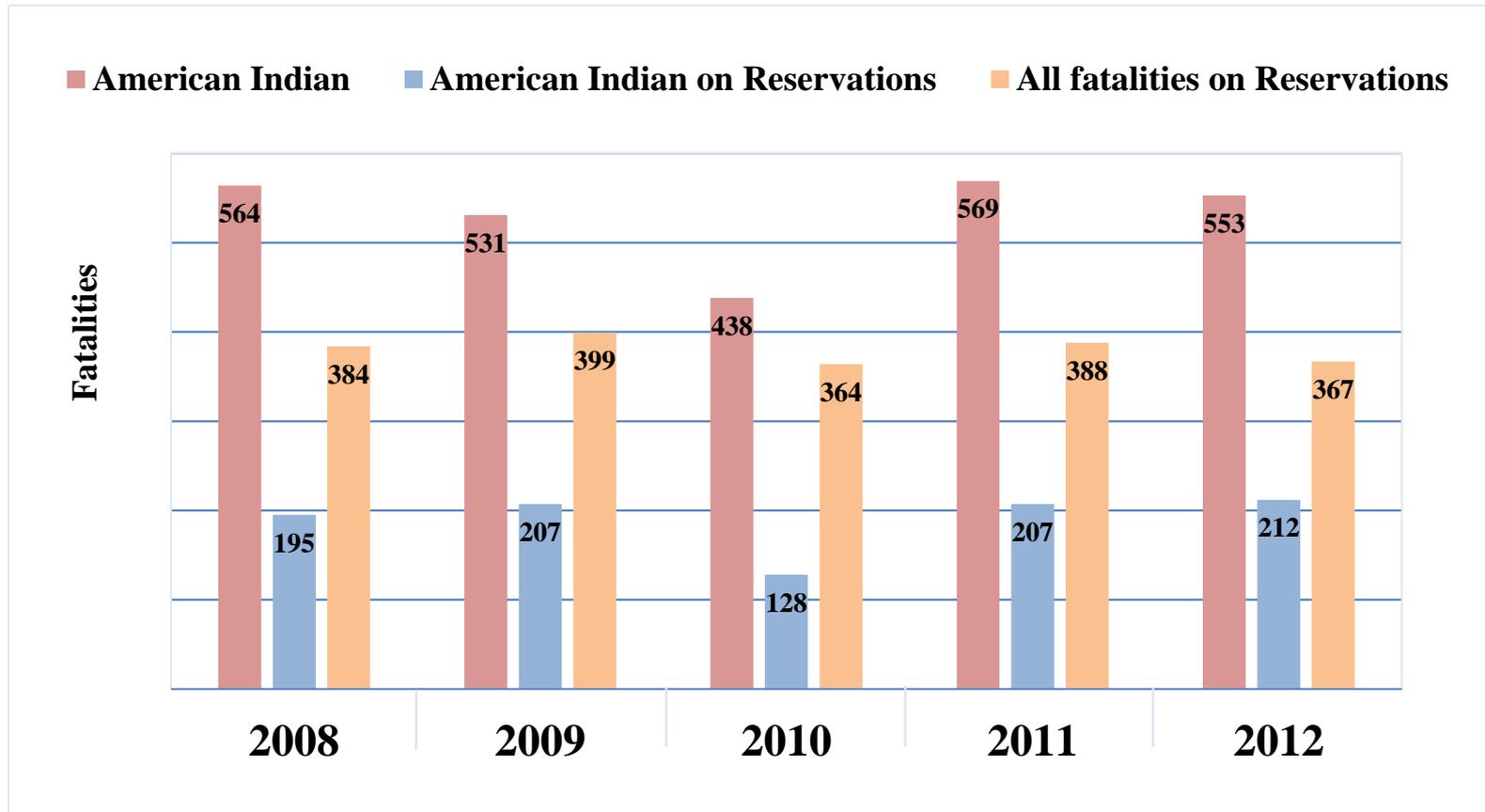


National American Indian Traffic Safety

Total Traffic Fatalities 2008 to 2012

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Figure 1. Total Traffic Fatalities by year, for 2008 to 2012 for American Indian, American Indian on-Reservation, and all Fatalities on the Reservation.



Source: Fatality Analysis Reporting System, Native American Traffic Safety Facts (2008-2012); retrieved: http://www-nrd.nhtsa.dot.gov/departments/nrd-30/nca/STSI/NA_Report.htm on 9/8/2015.



WA Traffic Fatalities by Race, 2003-2012

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Table 1. Traffic Fatality Rates by race and primary cause for 2003 to 2012 in Washington State .

Fatality Rates per 100,000 Washington State Population from 2003 - 2012

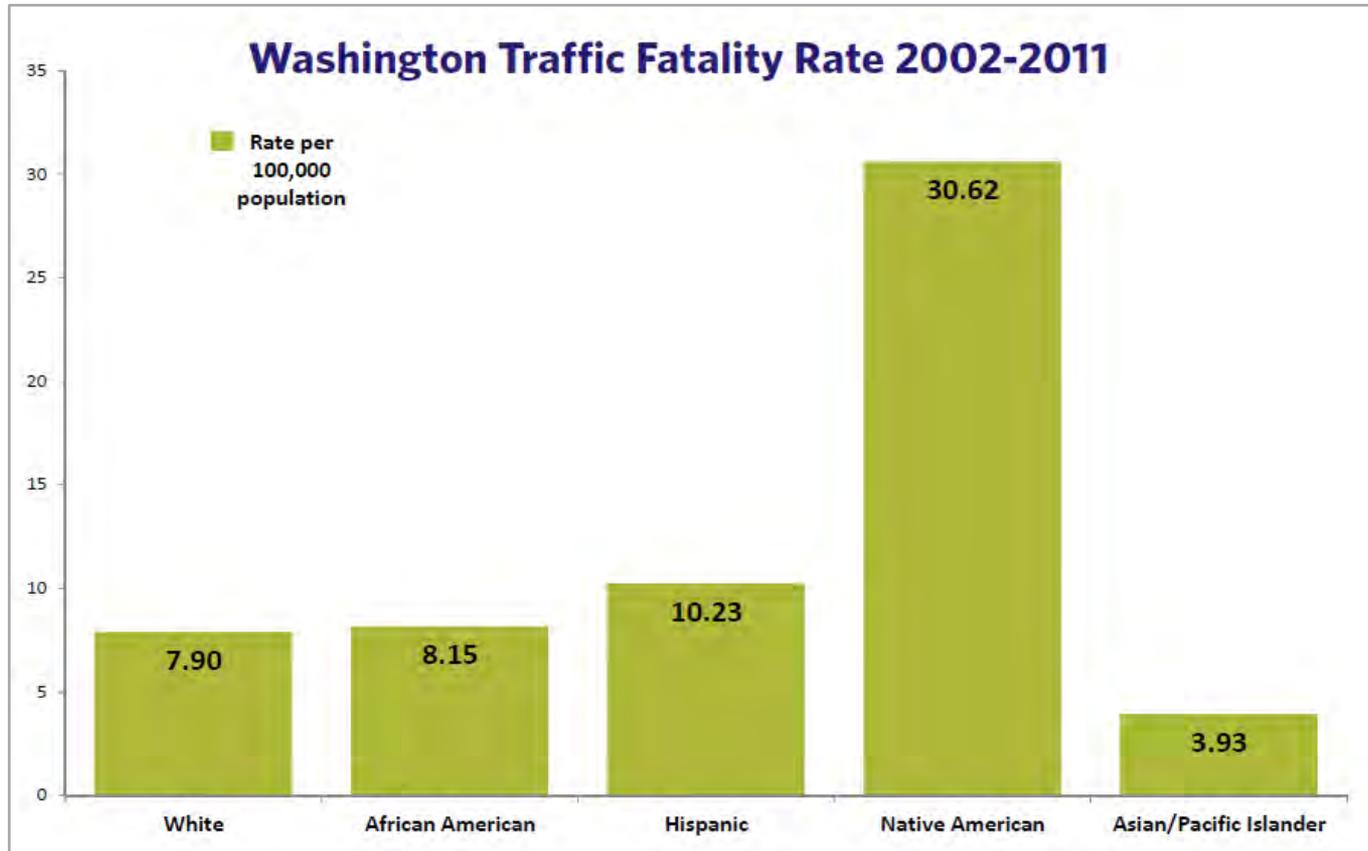
	Total Fatalities	Vehicle Occupants	Unrestrained Vehicle Occupants	Impaired Driver Involved	Speeding Involved	Pedestrian
American Indian/Alaska Native	30.00	24.72	14.59	17.38	13.14	4.86
Hispanic	9.75	8.76	3.46	4.55	3.74	0.91
Black	7.77	6.51	2.59	3.88	4.27	1.16
White	7.58	6.51	1.94	3.55	2.92	0.92
Asian/ Pacific Islander	3.81	2.80	0.73	1.32	1.51	0.92

Source: Fatality Analysis Reporting System, WTSC Research and Data Division Office of Financial Management, Population Unit (prepared Feb. 7, 2014).



Motor Vehicle Related Injuries Report Washington Department of Health, 2013

Figure 2. Washington State Traffic Fatality per 100,000 population by race, for 2002 to 2011.

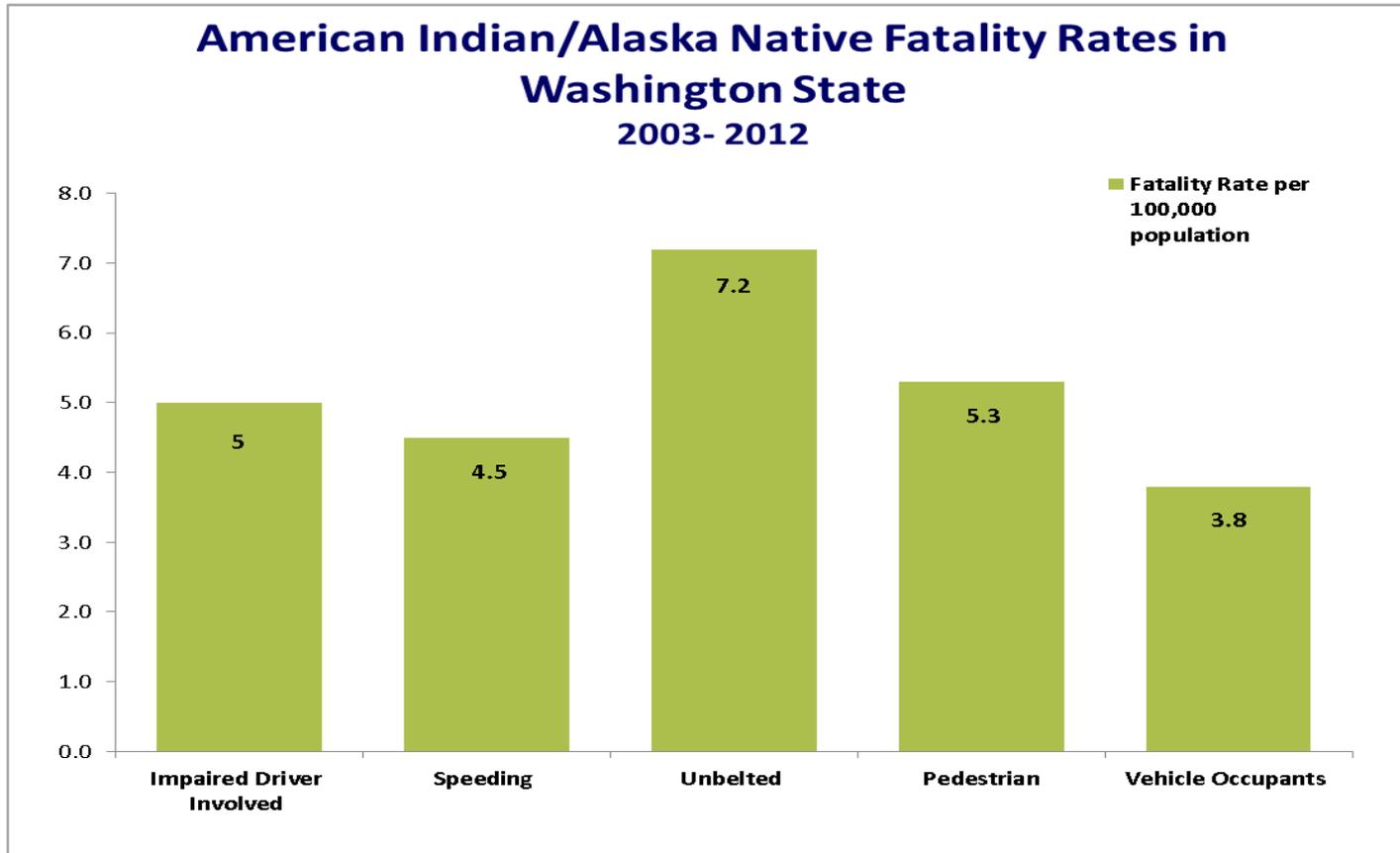


Source: Washington State Injury and Violence Prevention Guide (Jan. 2013); <http://www.doh.wa.gov/Portals/1/Documents/2900/InjuryReportFinal.pdf>; p. 22.



WA State Native American Fatality Rates

Figure 3. American Indian and Alaska Native Fatality Rates in Washington State 2003-2012.



Source: Washington's Fatality Analysis Reporting System (FARS) data 2003-2012.



Target Zero Priorities

Figure 4. Washington State Target Zero® - Washington State Strategic Highway Safety Plan (2013) top priorities for reducing traffic fatalities.

Priority Level One	Priority Level Two	
1. Impaired Driver involved	1. Unrestrained Vehicle Occupant	1. Older Driver 75+
2. Run-off-the Road	2. Unlicensed Driver	2. Heavy Truck Involved
3. Speeding involved	Involved	3. Drowsy Driver Involved
4. Young Driver 16-25 involved	3. Opposite Direction	4. Bicyclists
5. Distracted Driver Involved	4. Motorcyclists	5. Work Zone
6. Intersection Related	5. Pedestrians	6. Wildlife
7. Traffic Data Systems	6. EMS & Trauma Care Systems	7. School Bus Involved
	Priority Level Three	8. Vehicle-Train

Source: Target Zero® - Washington State Strategic Highway Safety Plan (2013): Zero Deaths & Zero Serious Injuries by 2030.



Tribal Planning Resources

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Inventory & Analysis of Data

- * **#1 – Safety Committee**
- * Population Demographics
- * Employment/Income
- * Vehicle Ownership
- * Crash Data
- * Fatalities
- * Households
- * Comprehensive Plan
- * Sub Area Plans
- * Transportation Plan
- * Inter-local Agreements
- * Cross-Deputization Agreements
- * Others



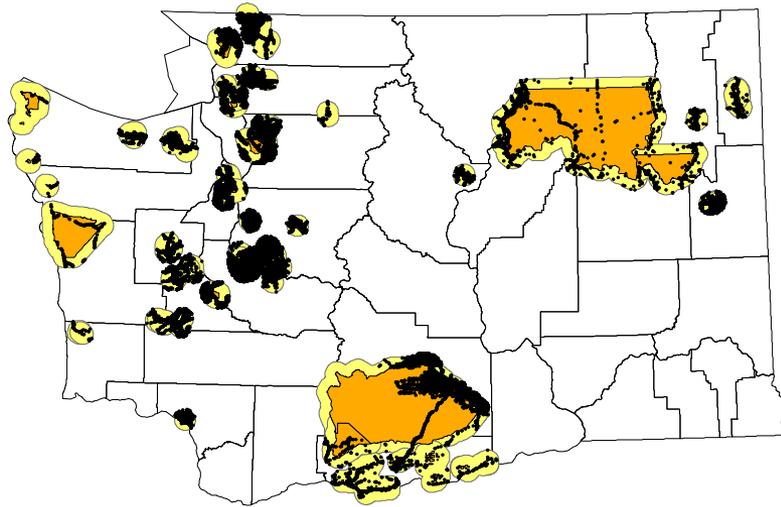
EWU Crash Data and Geospatial Analysis

- Request for data from WSDOT.
- Analysis of Data for All Reservations in the State, Six selected Reservations for our WTSC Demonstration Project.
- Individual Reservation Analysis of Tribal Data.
- Identification of the need to examine crash data on reservation and within a reasonable distance of the reservation to represent the “driving environment” (5 mile buffer).
- Not examined: Crash data along corridors connecting reservations to key destinations.

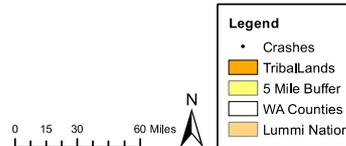
Washington Crashes On or Near Indian Reservations, 2010-2014

Location	Fatal	Serious	Total
On Reservation	105	272	10,390
Near (5 mi) Reservation	631	2913	168,248
Total On and Near	736	3185	178,638

Crashes on/near Washington American Indian Tribes 2010-2014



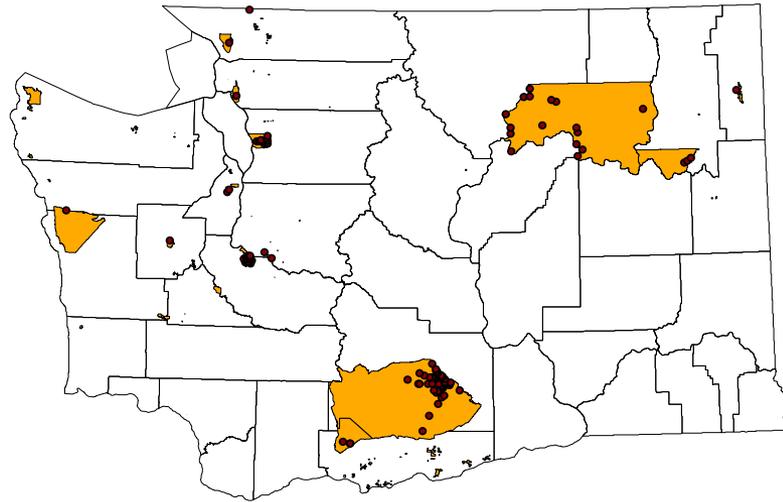
Total Crashes: 178,638



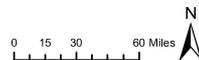
Washington State Tribal Transportation Safety Demonstration Project
EWU Urban & Regional Planning
Funded by: The Washington Traffic Safety Commission
Source: Crash & Data Reporting Branch, WSDOT-TDGO, Multimodal Planning Division, April 1, 2015

All Crashes On or Near Reservations and Tribal Trust Lands, Washington State, 2010- 2014

Fatal Crashes on Washington American Indian Tribes 2010-2014



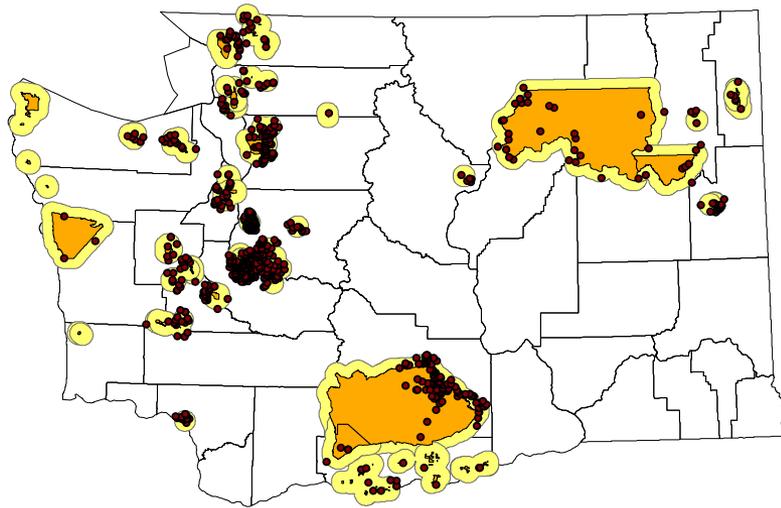
Total Crashes: 105



Washington State Tribal Transportation Safety Demonstration Project
EWU Urban & Regional Planning
Funded by: The Washington Traffic Safety Commission
Source: Crash & Data Reporting Branch, WSDOT-TDGO, Multimodal Planning Division, April 1, 2015

Fatal Crashes On Reservations and Tribal Trust Lands, Washington State, 2010- 2014

Fatal Crashes on/near Washington American Indian Tribes
2010-2014

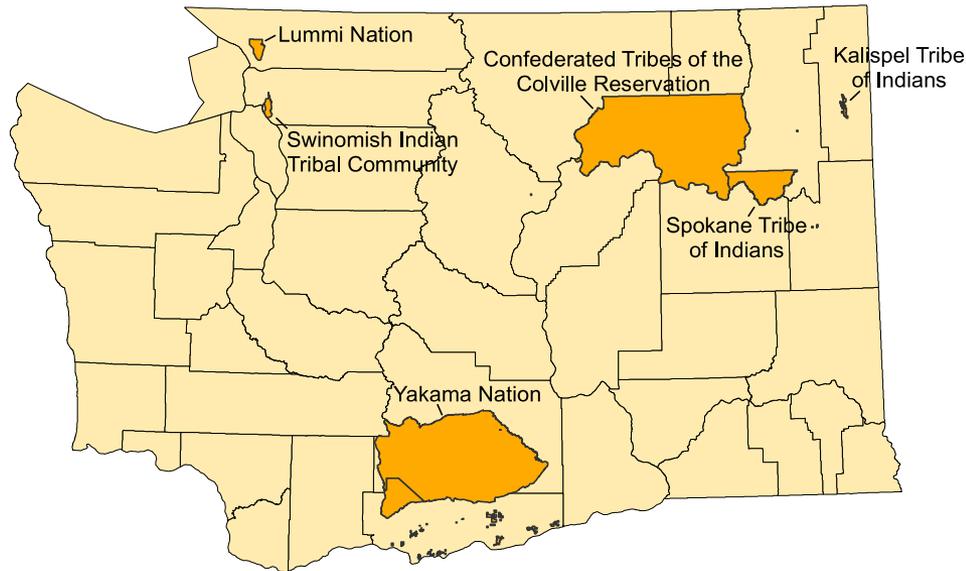


Total Crashes: 736

Washington State Tribal Transportation Safety Demonstration Project
EWU Urban & Regional Planning
Funded by: The Washington Traffic Safety Commission
Source: Crash & Data Reporting Branch, WSDOT-TDGO, Multimodal Planning Division, April 1, 2015

Fatal Crashes On or Near Reservations and Tribal Trust Lands, Washington State, 2010-2014

Six Demonstration Project Tribes



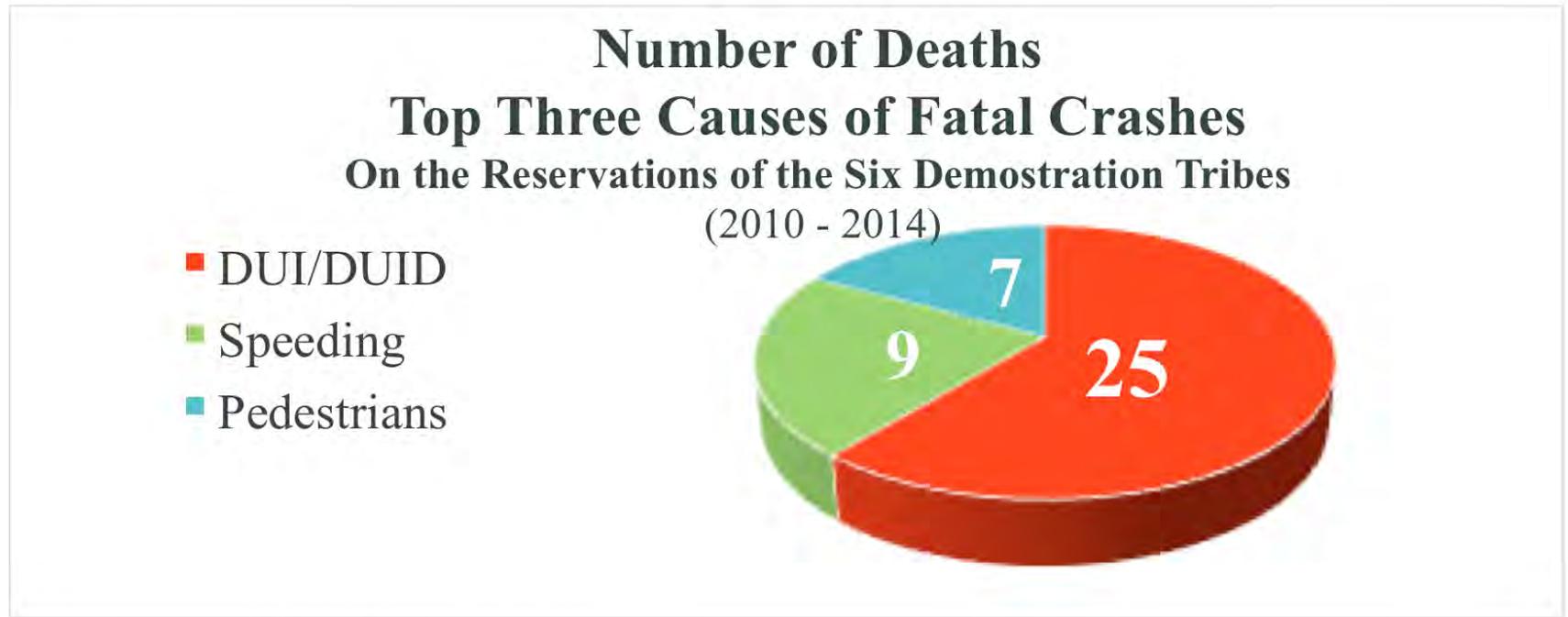
EWU Data Driven Traffic Safety Planning Project Six Tribes

Fatal Crashes on the Six Reservations.

For the six selected tribes there were a total of 41 fatalities in the top three contributing factor categories. These were:

- 1) Driver Impairment including driving under the influence of alcohol (DUI) or driving under the influence of drugs (DUID) with 25 deaths,
- 2) Speeding which involved 6 deaths, and
- 3) Accidents which involved hitting Pedestrians with 7 deaths (Figure 4).

Figure 4. Number of deaths in the top three fatal crash categories on the six reservations from 2010 to 2014.



Total 41 Fatalities

Source: Washington's Fatality Analysis Reporting System (FARS) data for 2010-2014.

Fatalities within Five Miles of the Six Reservations.

There were 91 deaths in the top three behavioral factors contributing to crash fatalities within five miles of the six reservations. The top factors were:

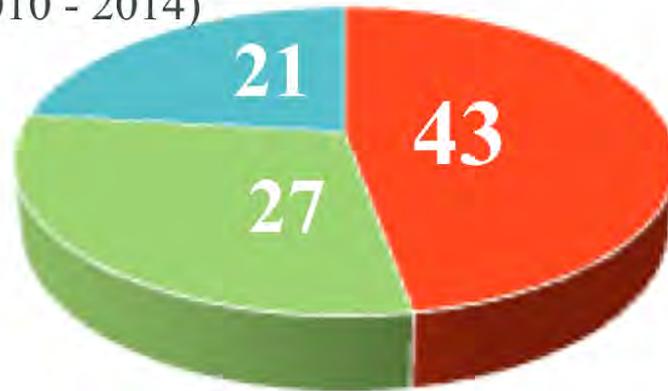
- 1) Driver Impairment including driving under the influence of alcohol (DUI) or driving under the influence of drugs (DUID) with 43 deaths,
- 2) Speeding which involved 27 deaths, and
- 3) Accidents which involved hitting Pedestrians with 21 deaths (Figure 5).

Figure 5. Number of deaths in the top three causes of fatal crashes within five miles of the reservations (2010 - 2014)

**Number of Deaths
Top Three Causes of Fatal Crashes
Within Five Miles of each of the Six Reservations
(2010 - 2014)**

- DUI/DUID
- Speeding
- Pedestrians

Total 91 Fatalities



Source: Washington's Fatality Analysis Reporting System (FARS) data for 2010-2014.

Table 2. Top fatality factor for each of the six tribes, by location on and off the reservation.

Jurisdiction	On Reservation	Off Reservation
Colville	<i>Speeding (5)</i>	<i>Impairment (6)</i>
Kalispel	<i>Following too close (1)</i>	<i>Impairment (3)</i>
Lummi	<i>Distracted Driving (1)</i>	<i>Speeding (6)</i>
Spokane	<i>Impairment (1)</i>	<i>Impairment (4)</i>
Swinomish	<i>Impairment (1)</i>	<i>Impairment (5)</i>
Yakama	<i>Impairment (21)</i>	<i>Impairment (21)</i>

Source: Washington’s Fatality Analysis Reporting System (FARS) data for 2010-2014.

Target Zero Priorities, Washington State Strategic Highway Safety Plan, 2013.

Figure 4. Washington State Target Zero® - Washington State Strategic Highway Safety Plan (2013) top priorities for reducing traffic fatalities.

Priority Level One	Priority Level Two	
1. Impaired Driver involved	1. Unrestrained Vehicle Occupant	1. Older Driver 75+
2. Run-off-the Road	2. Unlicensed Driver Involved	2. Heavy Truck Involved
3. Speeding involved	3. Opposite Direction	3. Drowsy Driver Involved
4. Young Driver 16-25 involved	4. Motorcyclists	4. Bicyclists
5. Distracted Driver Involved	5. Pedestrians	5. Work Zone
6. Intersection Related	6. EMS & Trauma Care Systems	6. Wildlife
7. Traffic Data Systems		7. School Bus Involved
	Priority Level Three	8. Vehicle-Train

Source: Target Zero® - Washington State Strategic Highway Safety Plan (2013): Zero Deaths & Zero Serious Injuries by 2030.

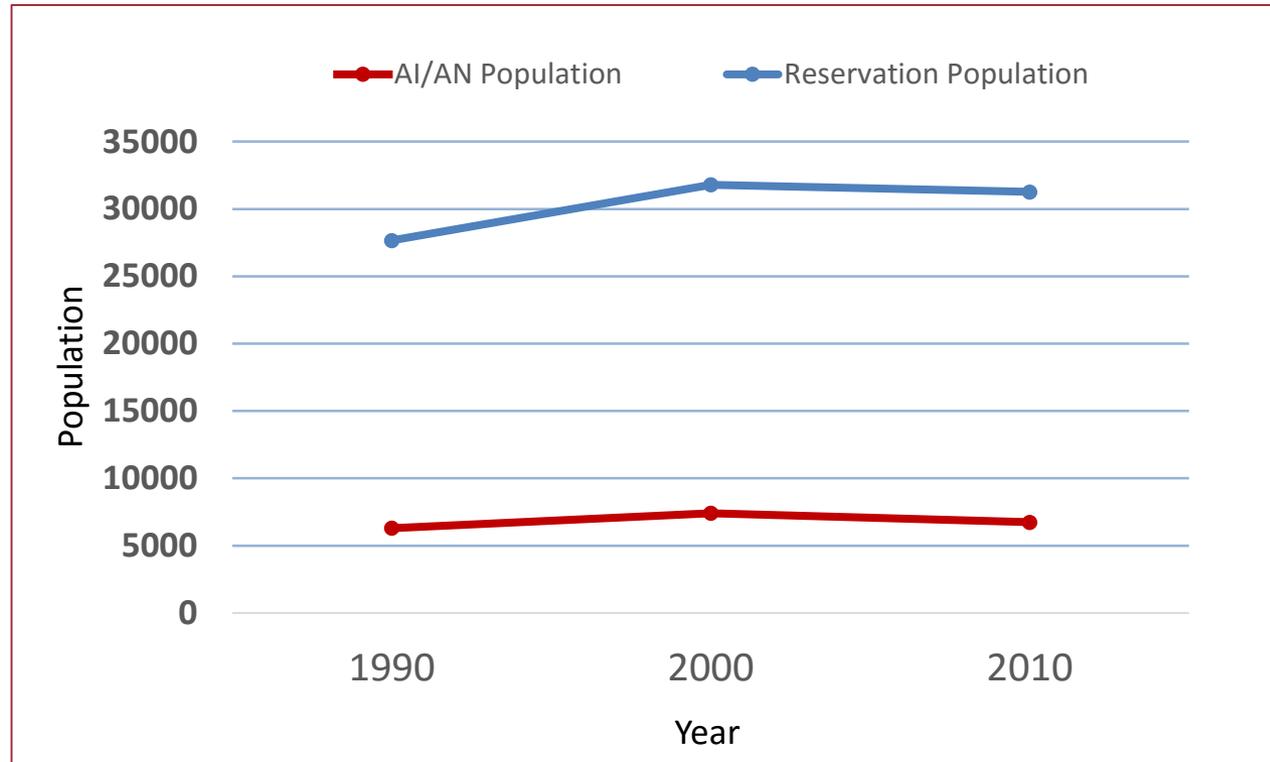
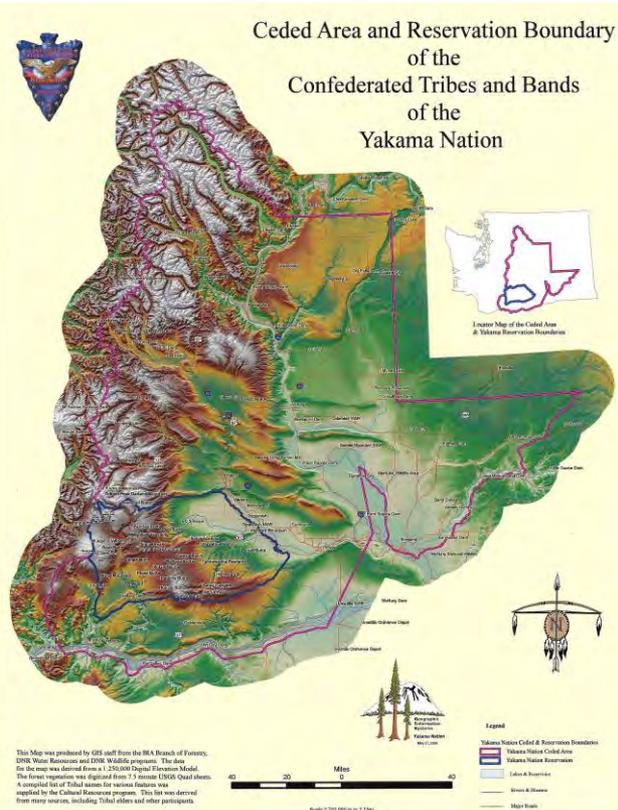


Yakama Nation Crash Data Assessment and Analysis

EWU Demonstration Project

Yakama Nation Reservation Population from 1990 to 2010

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1990 Reservation	1990 AI/AN	2000 Reservation	2000 AI/AN	2010 Reservation	2010 AI/AN
27,668	6,307	31,799	7,411	31,272	6,738

Source: US Census data 1990 – 2010.

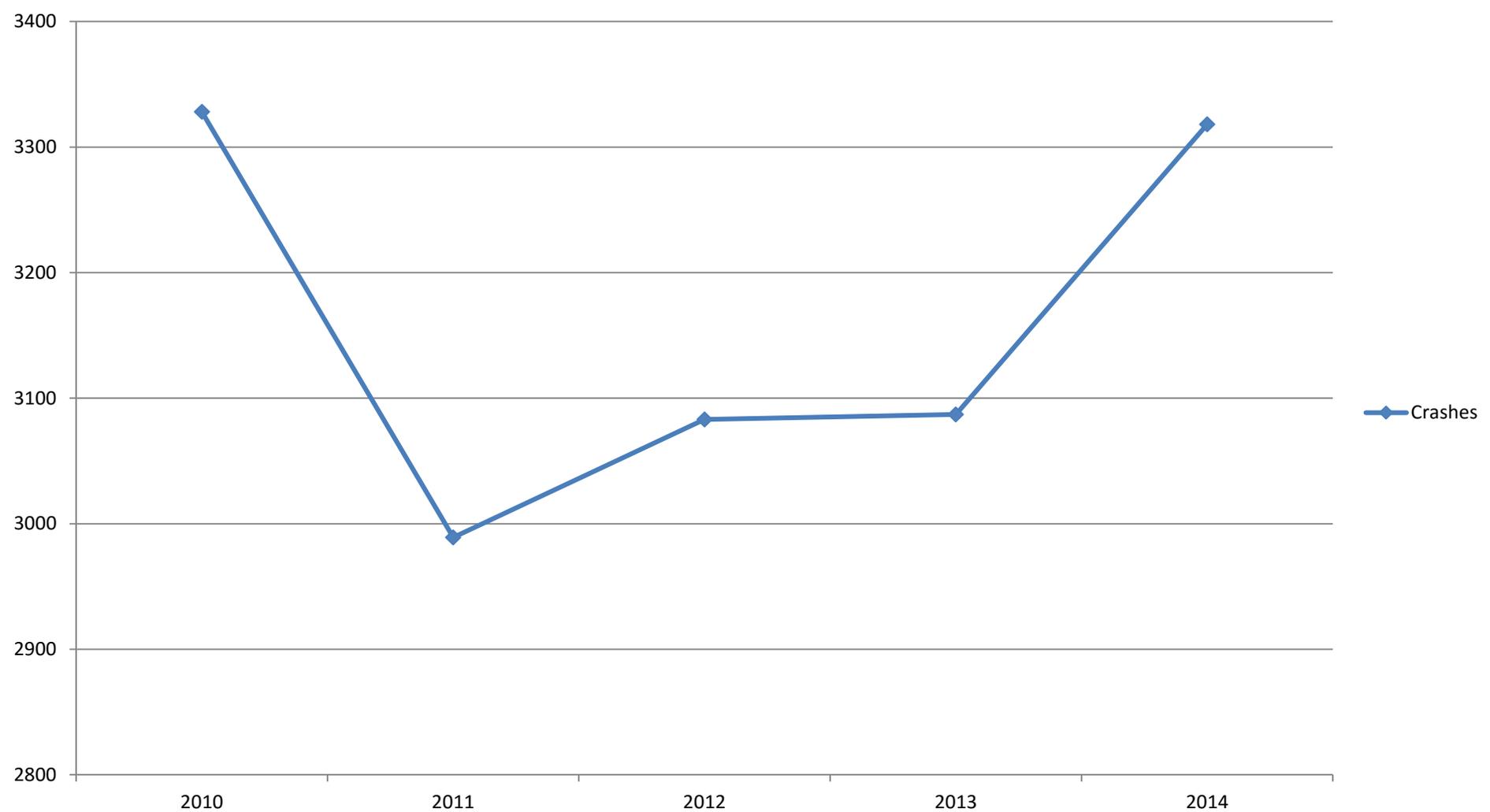


Crash Data Geospatial Analysis: The Yakama Nation 2010-2014

- Geospatial mapping and examination of crashes on reservations and tribal trust lands;
- Creation of a five mile buffer around all reservations and tribal trust lands;
- Analysis of crash data for all crashes, serious injury crashes, and fatal crashes for on and near reservations;
- Analysis of contributing factors (driver 1 and if listed driver 2).

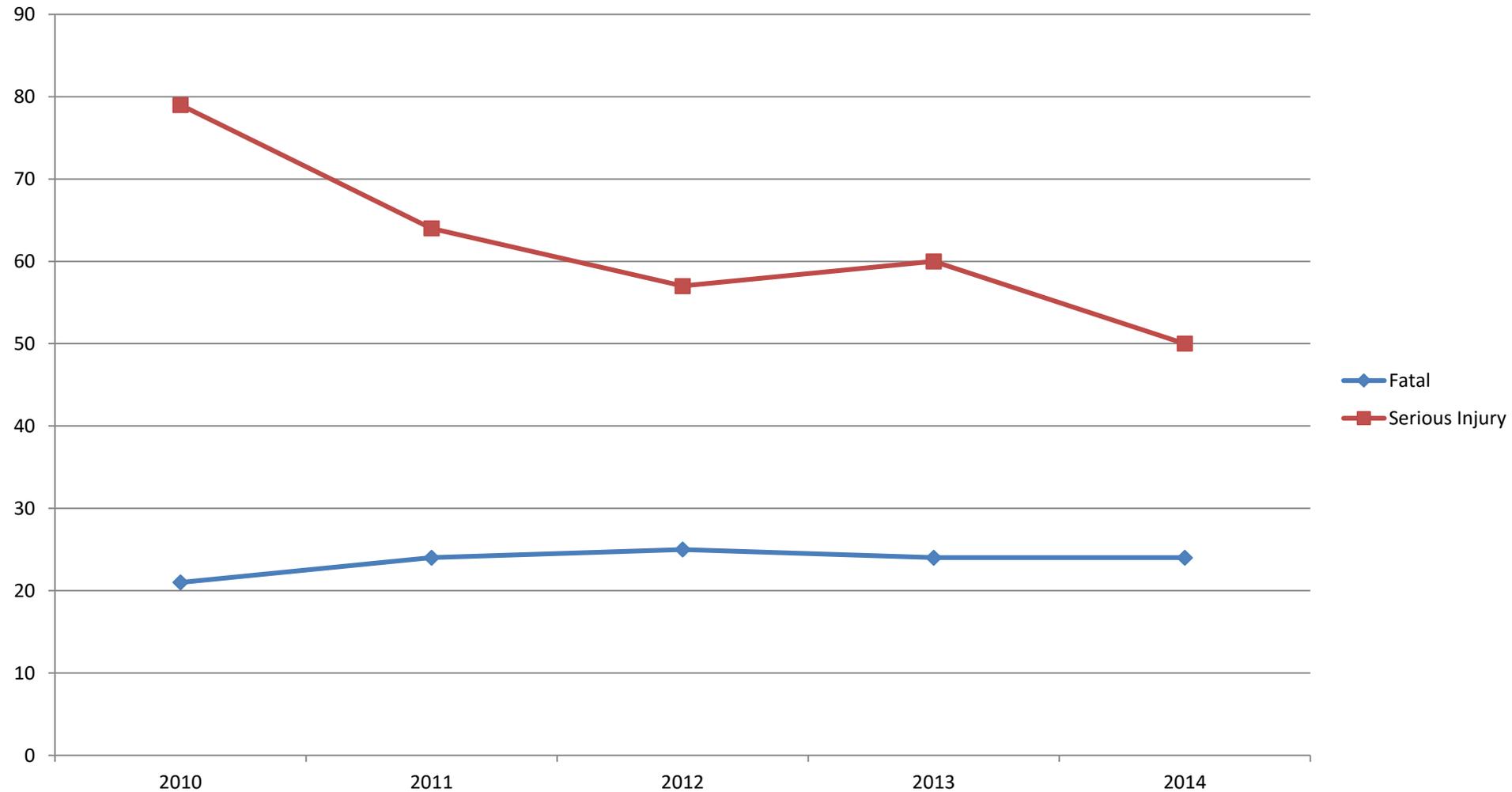
YAKAMA Nation, All Crashes, 2010-2014

All Crashes on or near Yakama Nation, 2010-2014



YAKAMA Nation, Seious Injury and Fatal Crashes, 2010-2014

Fatal and Serious Injury Crashes

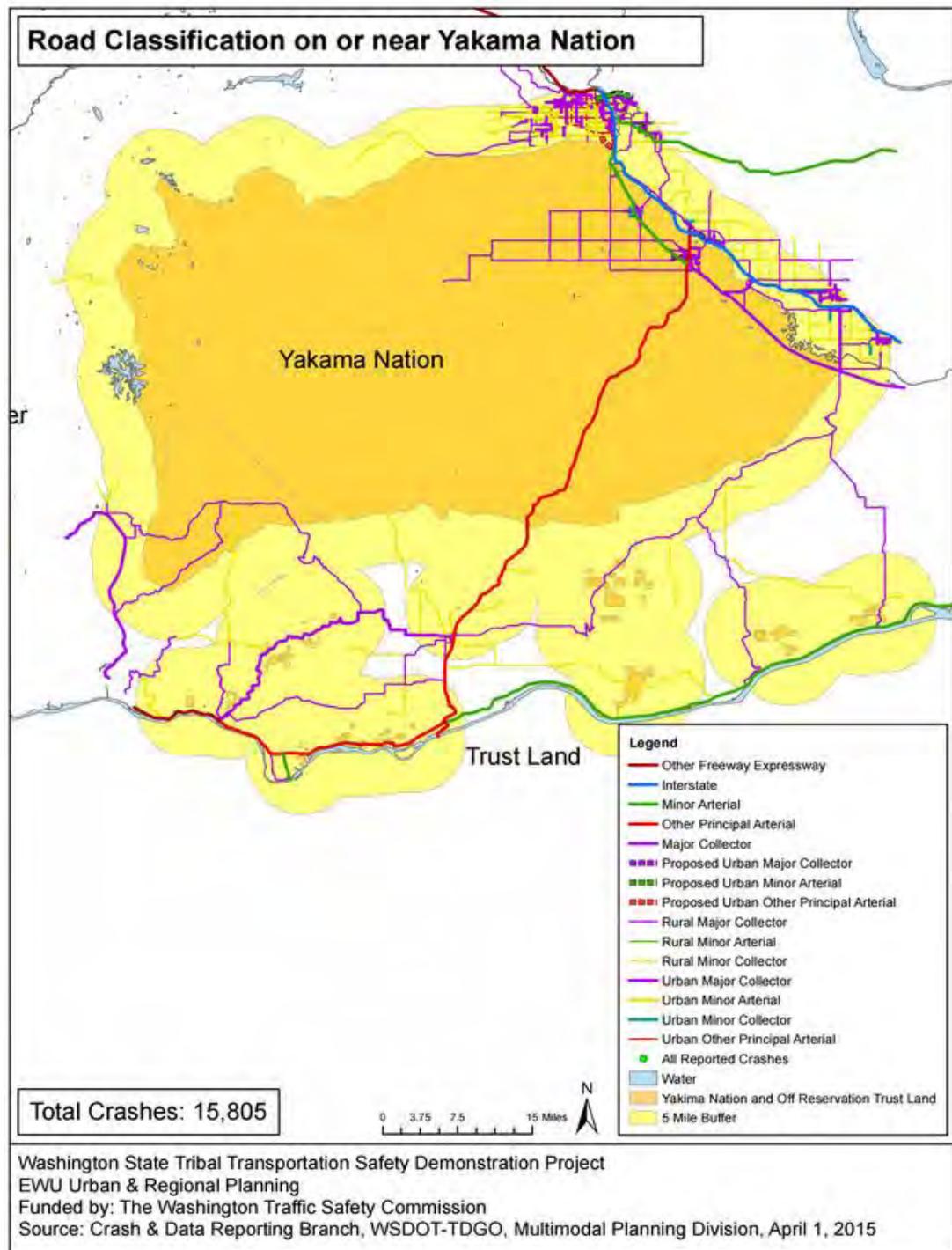


Data-driven Analysis



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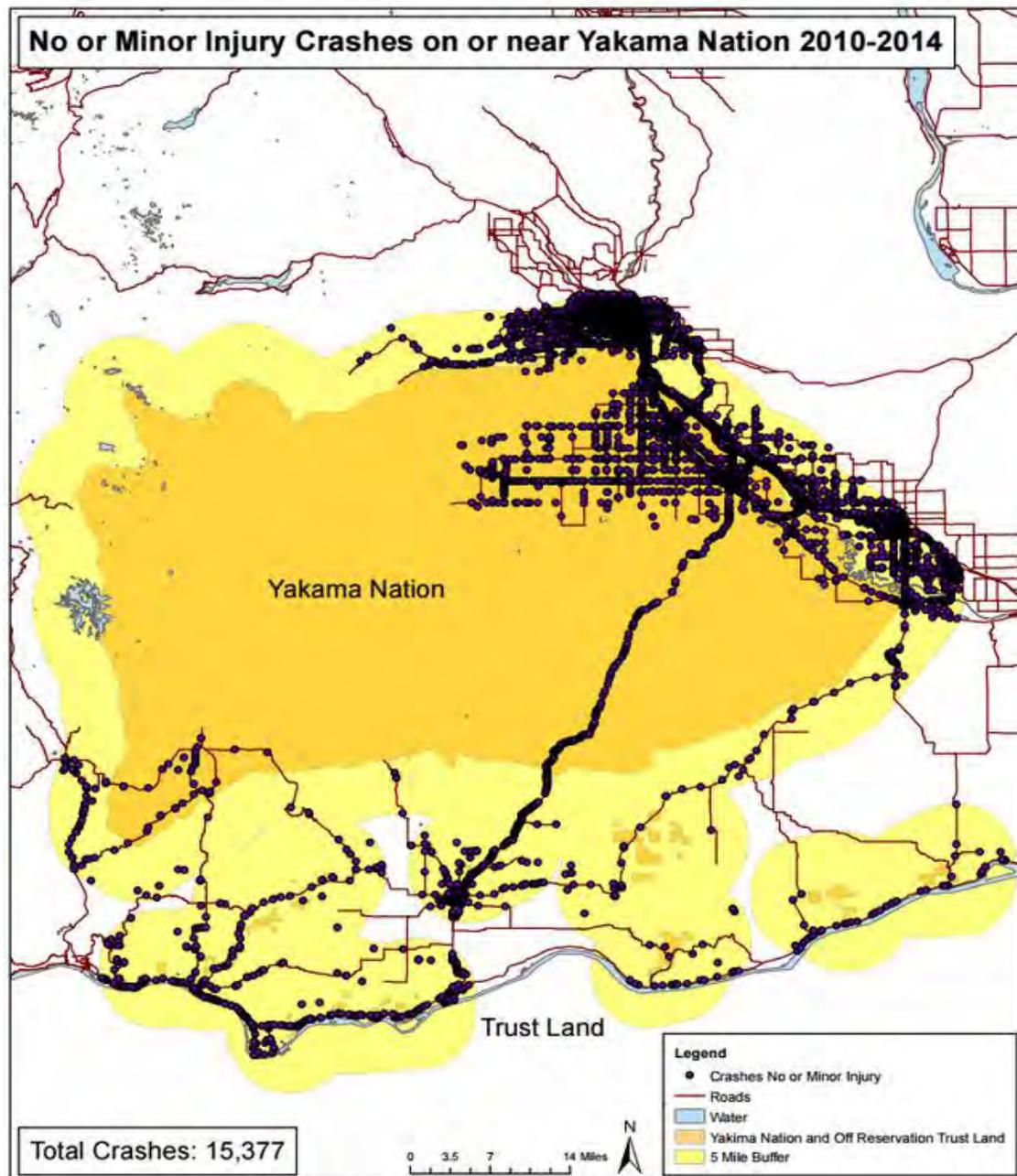
Road Classifications Yakama Reservation 2010-2014



Source: Data retrieved from: Washington State Department of Transportation (WSDOT) Functional Classification files: [http://www.wsdot.wa.gov/data/tools/geoportal/?config=FunctionalClass&layers={%22layer0%22%3A\[0\]%2C%22Functional+Class%22%3A\[0%2C1%2C2%2C3\]}](http://www.wsdot.wa.gov/data/tools/geoportal/?config=FunctionalClass&layers={%22layer0%22%3A[0]%2C%22Functional+Class%22%3A[0%2C1%2C2%2C3]}); September 1, 2015.



Non-Injury & Minor Injury Crashes on or near the Yakama Reservation 2010-2014



Washington State Tribal Transportation Safety Demonstration Project
EWU Urban & Regional Planning
Funded by: The Washington Traffic Safety Commission
Source: Crash & Data Reporting Branch, WSDOT-TDGO, Multimodal Planning Division, April 1, 2015



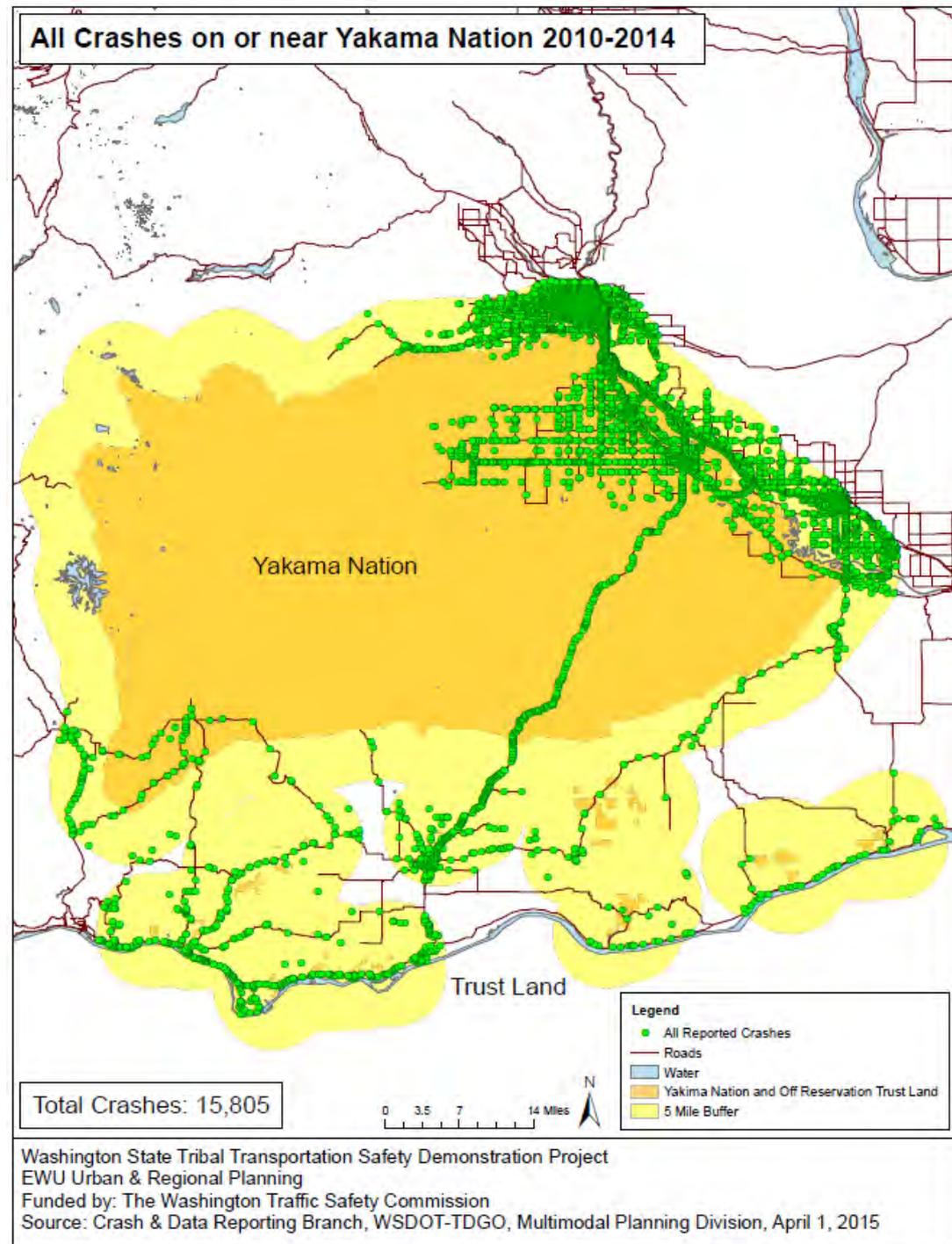
Data-driven Analysis



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All Crashes within 5 miles of the Yakama Reservation 2010-2014

*Data for crashes includes all Indian and non-Indian crashes, on or near, within a five mile radius of the exterior boundaries of the Yakama Reservation.



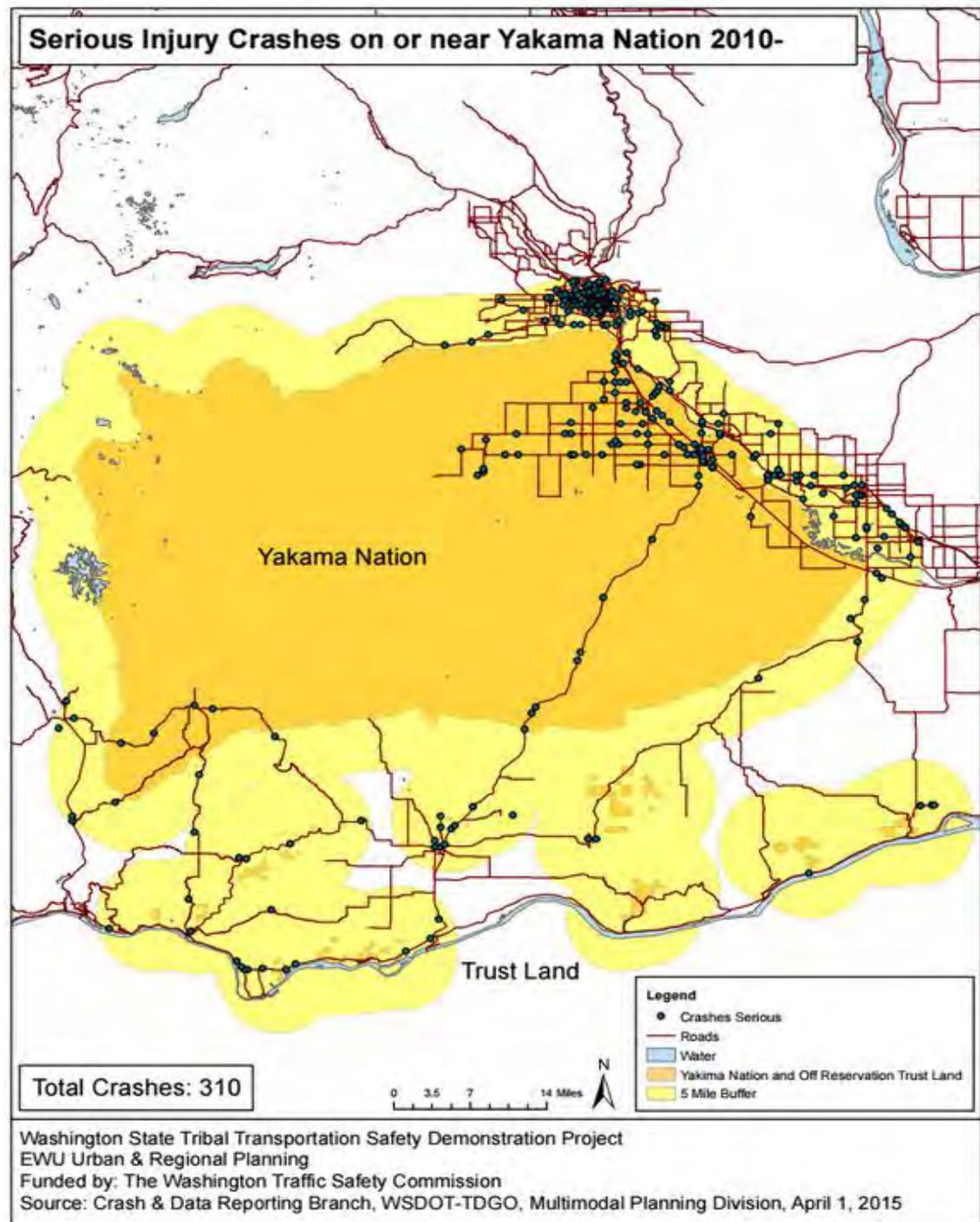
Data-driven Analysis



45

Serious Crashes on or near the Yakama Reservation 2010-2014

*Data for crashes includes all Indian and non-Indian crashes, on or near, within a five mile radius of the exterior boundaries of the Yakama Reservation.

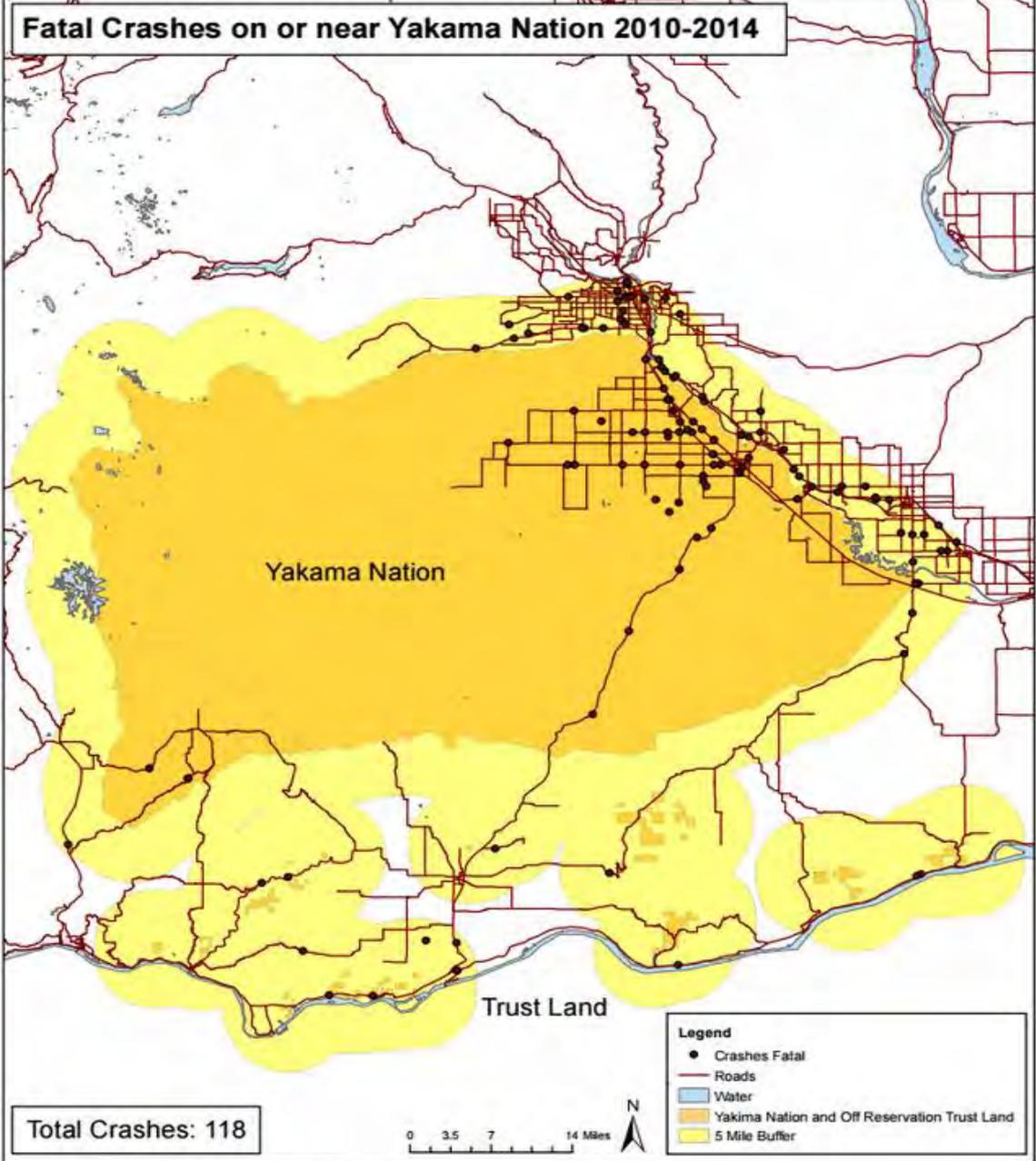


Data-driven Analysis



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Fatal Crashes on or near the Yakama Reservation 2010-2014



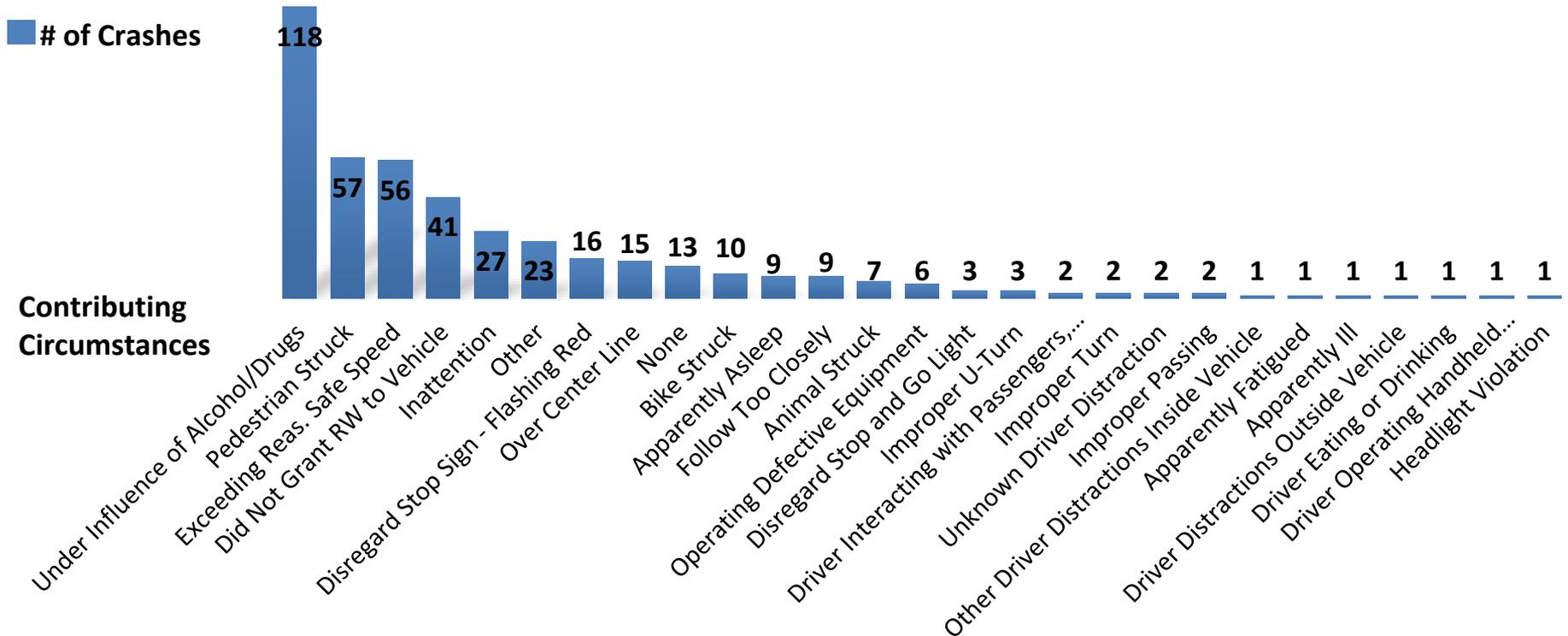
*Data for crashes includes all Indian and non-Indian crashes, on or near, within a five mile radius of the exterior boundaries of the Yakama Reservation.





Fatal & Serious Injury Crashes by Contributing Circumstances **On or Near** the Yakama Reservation (2010-2014)

47



Source: Washington State Department of Transportation (WSDOT), Fatality Analysis Reporting System (FARS) crash data (2010-2014).



All Reported Crashes On or Near Yakama Reservation 2010 to 2014

48

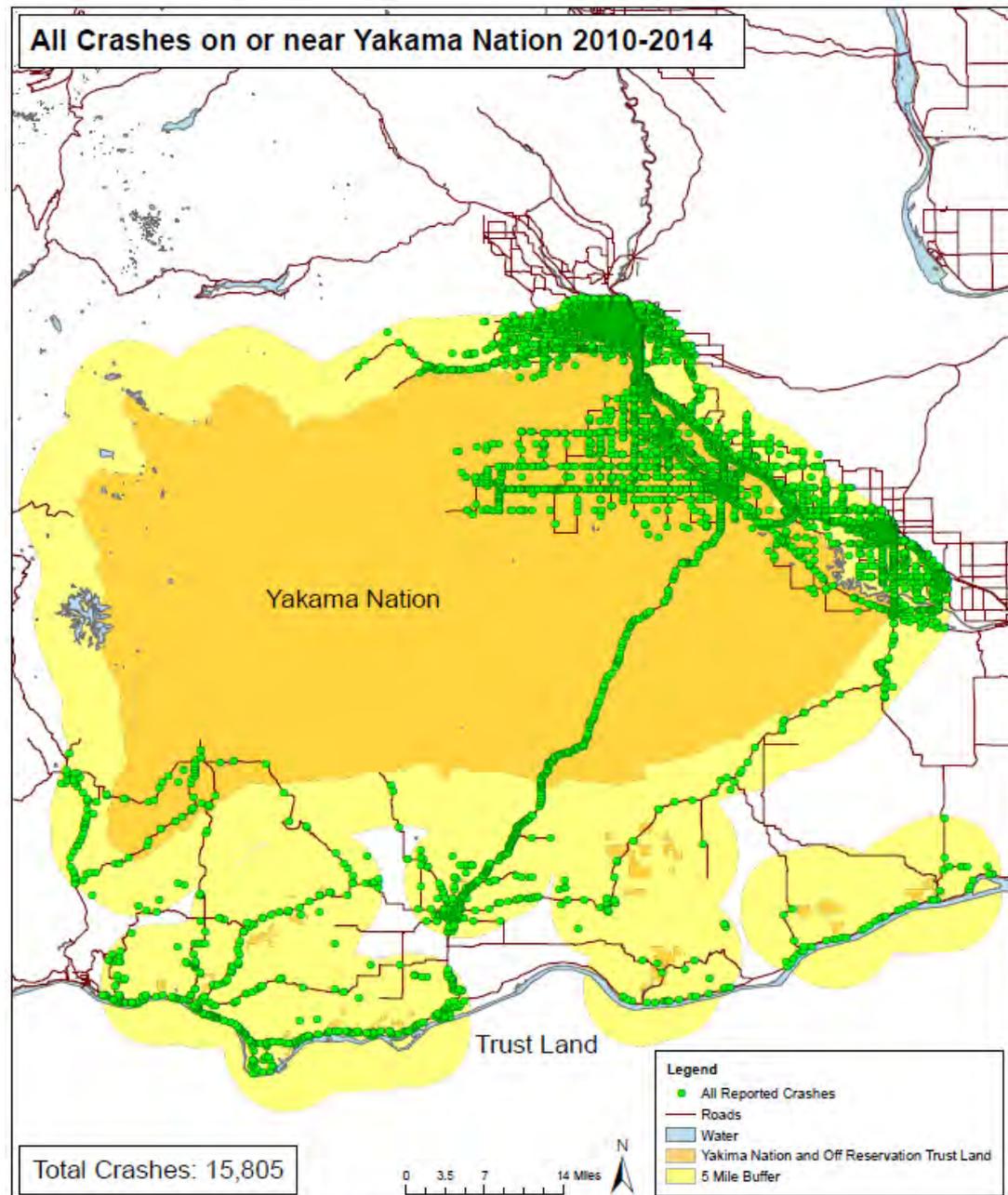
Year	2010	2011	2012	2013	2014	Total
Crashes	3,328	2,989	3,083	3,087	3,318	15,805

Source: Washington State Department of Transportation (WSDOT), Fatality Analysis Reporting System (FARS) crash data (2010-2014).

*Data for crashes includes all Indian and non-Indian crashes, on or near, within a five mile radius of the exterior boundaries of the Yakama Reservation.



All Crashes on or near the Yakama Reservation 2010-2014



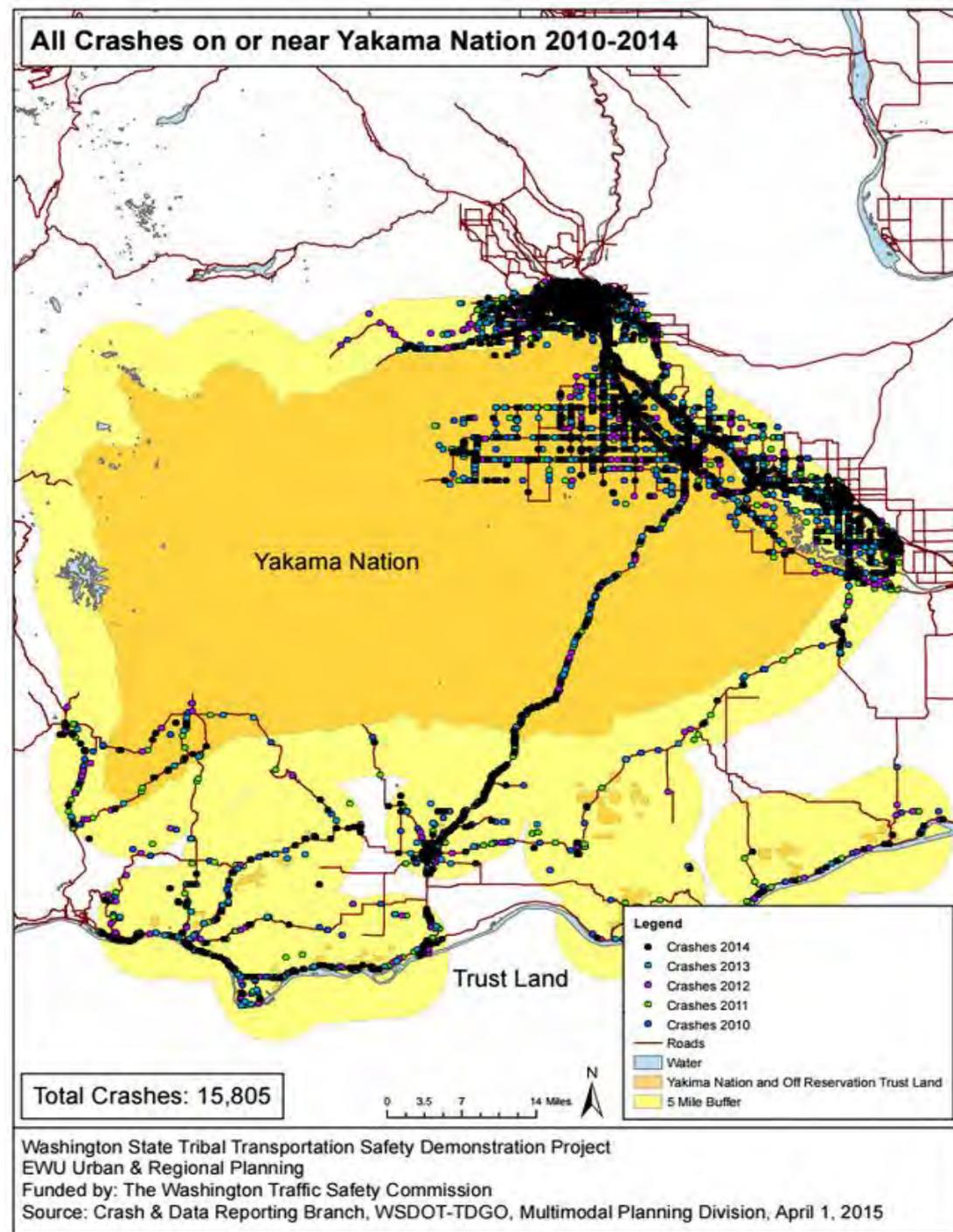
Washington State Tribal Transportation Safety Demonstration Project
EWU Urban & Regional Planning

Funded by: The Washington Traffic Safety Commission

Source: Crash & Data Reporting Branch, WSDOT-TDGO, Multimodal Planning Division, April 1, 2015



All Crashes by Year on or near the Yakama Reservation 2010-2014



Fatal & Serious Injury Crashes on or near Yakama Reservation from 2010 to 2014

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Crash Type	2010	2011	2012	2013	2014	Total
Fatal	21	24	25	24	24	118
Serious Injury	79	64	57	60	50	310

Source: Washington State Department of Transportation (WSDOT), Fatality Analysis Reporting System (FARS) crash data (2010-2014).

*Data for crashes includes all Indian and non-Indian crashes, on or near, within a five mile radius of the exterior boundaries of the Yakama Reservation.

