



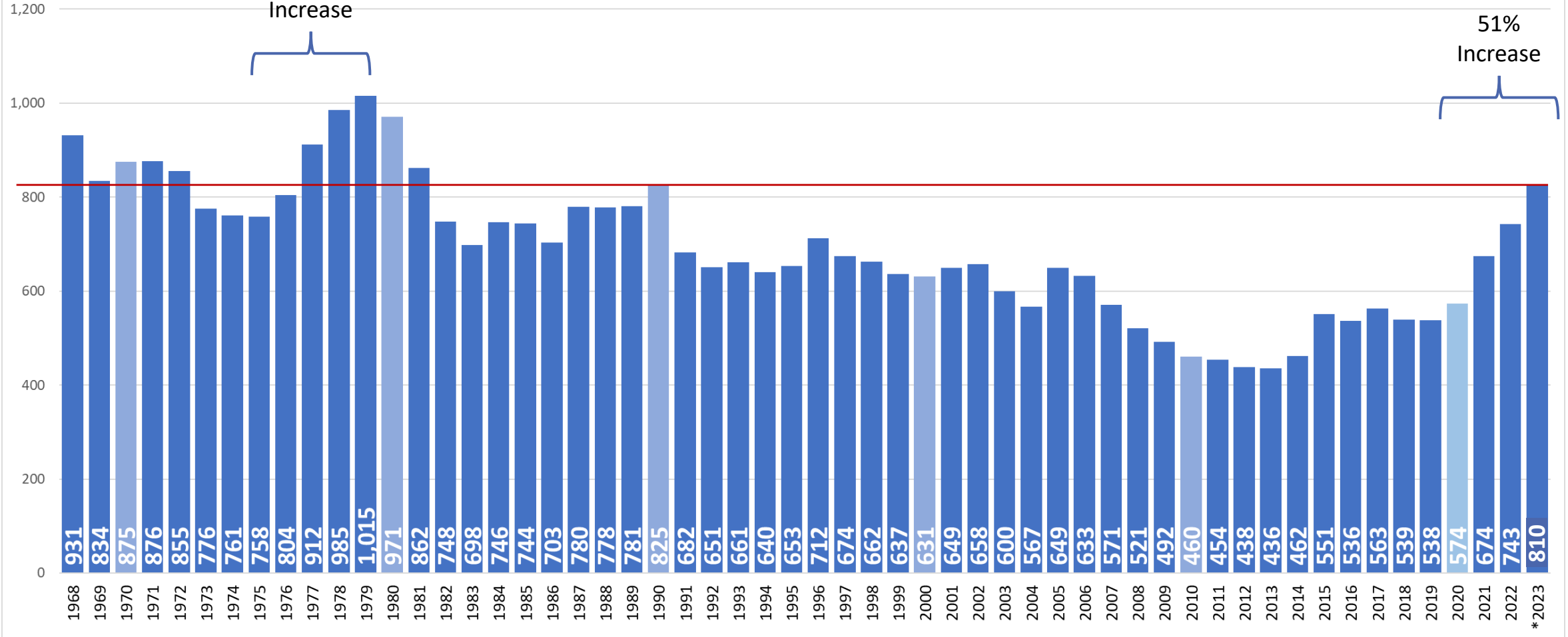
THE SAFE SYSTEM APPROACH TO TRAFFIC SAFETY

JTC Legislative Tour Sept. 23-24, 2024

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Mark McKechnie – WTSC

Washington State Traffic Fatalities 1968 - Present

Source: WTSC Historical Counts, CFC Files



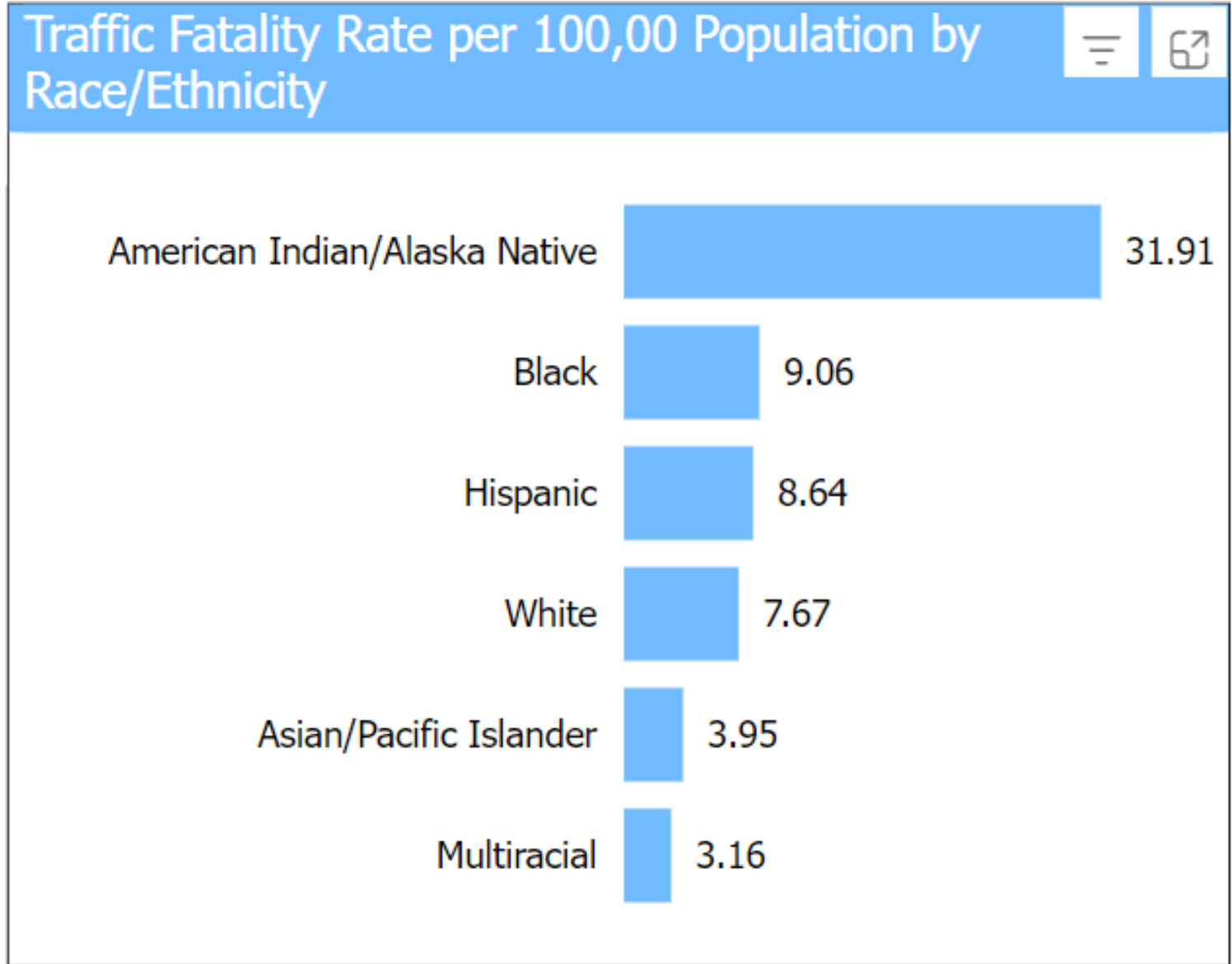
*2023 data is an unofficial estimate, incomplete, subject to change.

2023 DATA

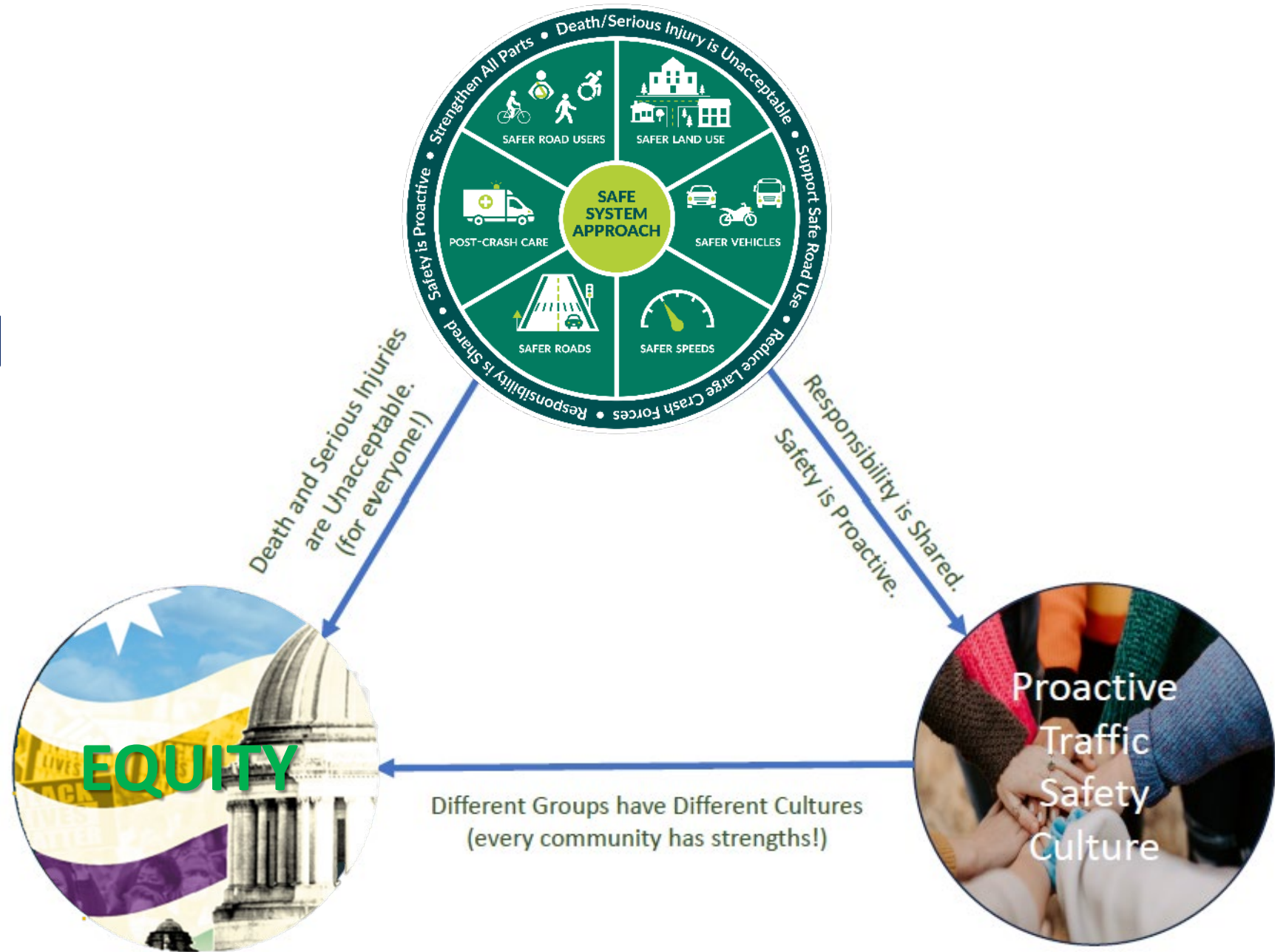
- 400 fatalities involving an alcohol/drug *impaired driver* – a 59% increase since 2019
- 251 fatalities involving a *speeding driver* – a 65% increase since 2019
- 157 *pedestrians* killed – the highest on record
- 141 *motorcyclists* killed – the highest on record
- 135 fatalities involved a *distracted driver*, the highest number since the distracted driving law was passed in 2017

2014-2022:
5,067 DEATHS

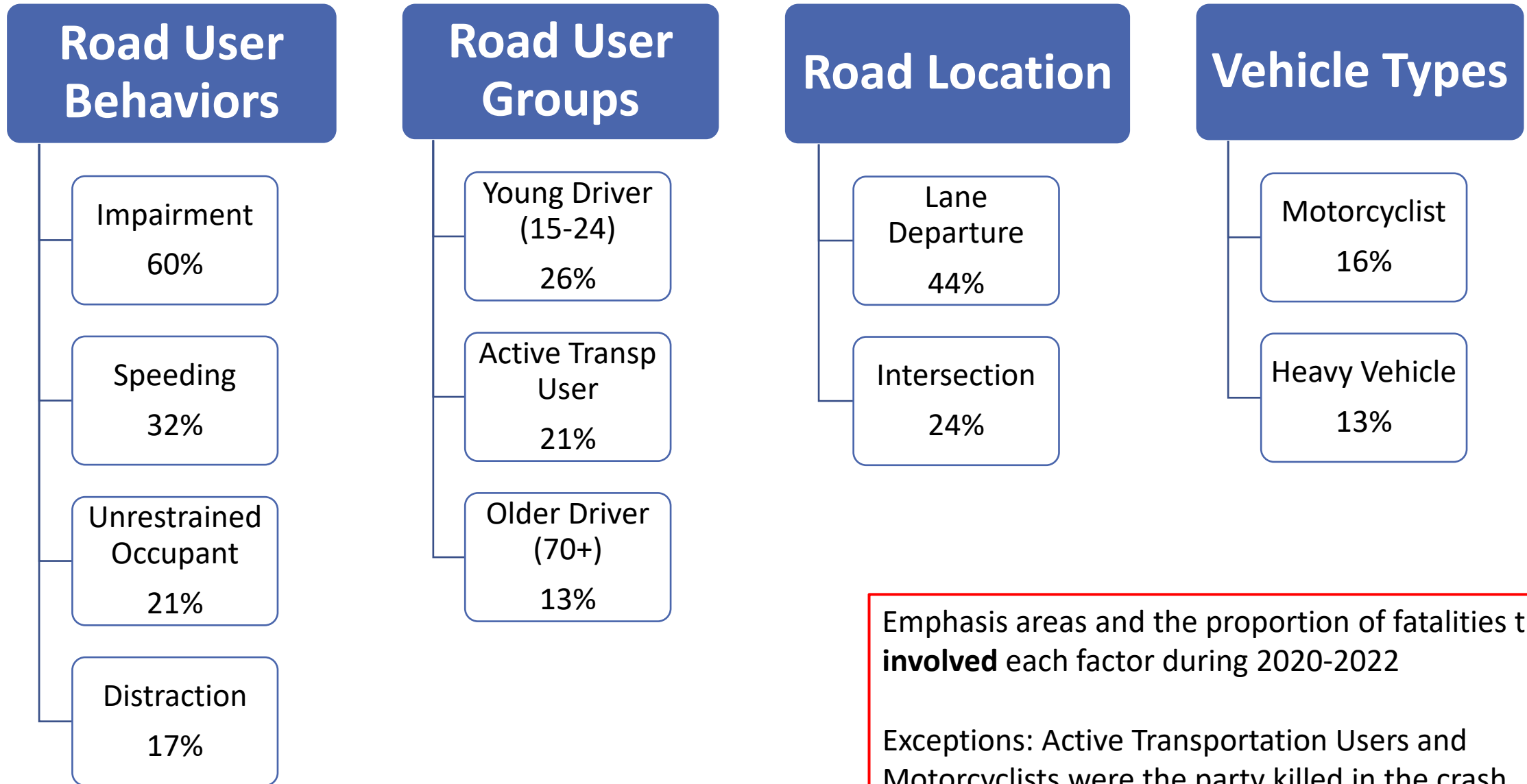
7.59 PER 100K
TOTAL POPULATION



WASHINGTON STRATEGIC HIGHWAY SAFETY PLAN 2024 - 2029



TARGET ZERO PLAN EMPHASIS AREAS (2020-22 data)



Emphasis areas and the proportion of fatalities that **involved** each factor during 2020-2022

Exceptions: Active Transportation Users and Motorcyclists were the party killed in the crash.

SAFE SYSTEM APPROACH



DEFINITION OF SAFETY PERFORMANCE

**Exposure
&
Conflicts**



**Likelihood
of crashes**



**Severity
of
crashes**

1. THE LOGIC OF THE SAFE SYSTEM

Death and serious injury are unacceptable, therefore:

The Safe System is designed and implemented to reduce large crash forces.

2. THE LOGIC OF THE SAFE SYSTEM

Safety is proactive, therefore:

We must strengthen all parts of the system that prevent collisions, reduce the force of collisions, and develop the capacity to respond quickly and effectively when collisions occur.

3. THE LOGIC OF THE SAFE SYSTEM

Responsibility is shared, therefore:

The Safe System supports safer use by all road users.

SAFE SYSTEM APPROACH

The SSA involves six overlapping elements that provide layers of safety.

We cannot rely on just one element alone to prevent death and serious injury.



SAFER LAND USE

- The SSA begins with Safer Land Use, which addresses the interactions between properties, roads, and facilities for walkers, rollers and transit. Keeping travel distances shorter reduces exposure to potential crashes.
- It is important to consider and plan where people live in relation to where they need to travel and how they will get there safely.
- Safer land use planning can help reduce disparities that resulted from historical patterns of housing segregation and underinvestment.

SAFER ROADS

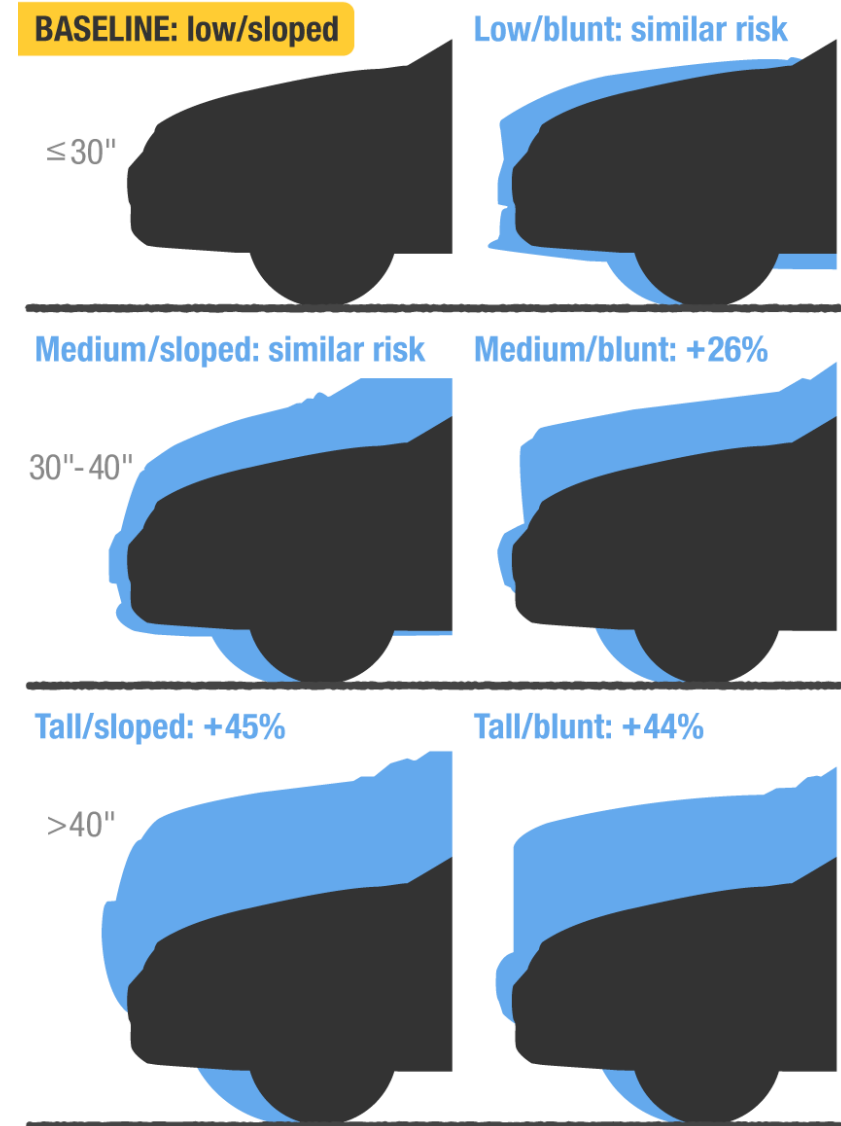
“Safer roads” include the network of facilities that allow people to travel using all modes, alone or in combination: walking, rolling, using transit, and driving. Safer roads help *manage speeds and minimize conflicts* between users. Users are separated in space and time.



Roundabouts decrease fatalities 90% compared to intersections where stop signs or traffic signals were previously used for traffic control

SAFER VEHICLES

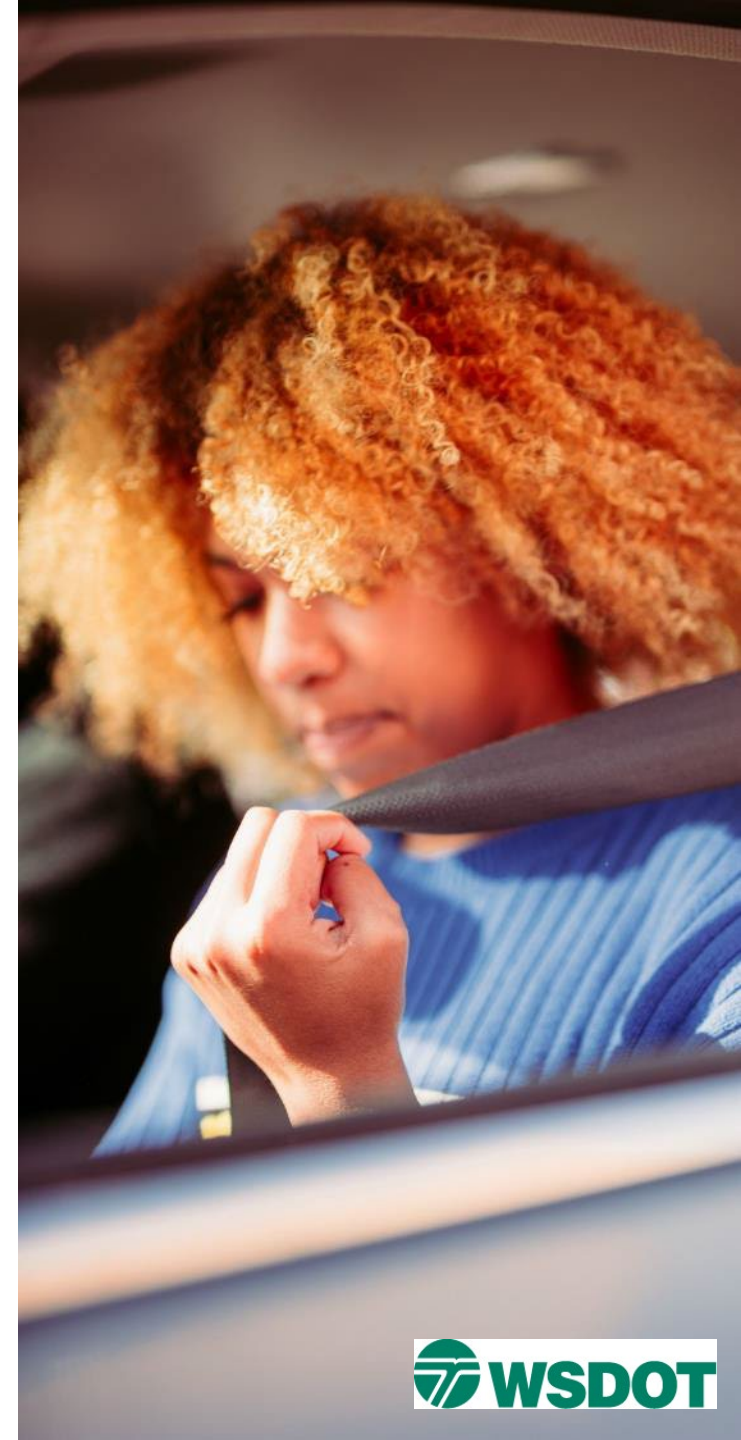
Safer vehicles better protect drivers, passengers, and everyone outside of the vehicle. Safer vehicles help to avoid collisions in the first place and help minimize injury when collisions occur. (Primarily regulated by federal agencies.)



Graphic from IIHS (2023), "Vehicles with higher, more vertical front ends pose greater risk to pedestrians"

SAFER VEHICLES

- Brakes, tires, and systems maintained.
- Collision avoidance: anti-lock brakes, automatic braking, etc.
- Features to support safe driving:
 - Good visibility
 - Reduce speeding (active or passive speed limiters)
 - Prevent impaired driving (detect alcohol or other impairment)
 - Reduce distractions for the driver
- Reduce crash forces and manage angles based upon:
 - Mass
 - Height
 - Speed



SAFER SPEEDS

Speed is the primary factor that increases or decreases the force of a crash.

Force equals mass time velocity squared.

Driver speed also **shrinks** their field of vision and **increases** the time it takes to brake or react to a possible collision.



Dangers of Higher Speeds:

- Increased stopping distance/time
- Loss of control in emergency maneuvers
- Limited field of vision (Vision narrows by filtering out visual information on the periphery. Driver focuses ahead.)
- Force increases exponentially: an increase of speed by 50% (20 to 40, or 40 to 60 mph) results in a **125%** increase in crash force.

SAFER SPEEDS

Actual speeds determine the seriousness of a crash. Reducing speeds involves a number of strategies across SSA elements:

- Self-explaining roads that prompt drivers to travel at lower speeds (narrower lanes, narrower roads, roundabouts)
- Deterrence and enforcement: Limits are set based upon safety and enforced by officers and cameras that are conspicuous to all drivers
- Drivers are educated on the dangers of speed and encouraged to follow posted speeds by friends, family, employers, and others
- Vehicles are designed to travel at safe speeds and technology may prohibit extreme speeds.



SAFER ROAD USERS

- Everyone benefits from learning and following the rules of the road and giving each other space.
- Safer road users understand risks and avoid behaviors that increase risk (likelihood and severity).
- Safer road users are *focused, patient, and sober*.
- Road users respond to safety cues and reminders from the environment (signs, signals, road design).
- Take basic safety precautions (seatbelt, helmet)



POST-CRASH CARE

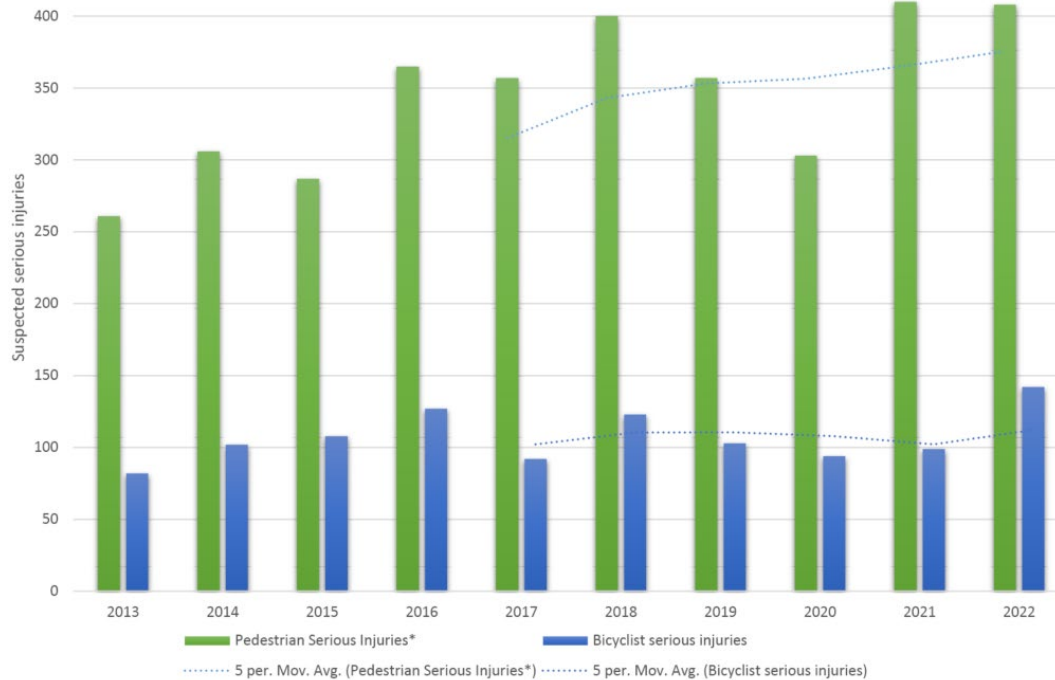
Timely response to a crash scene and trauma care can prevent death or permanent injury.

First responders also manage a scene to prevent additional collisions and collect data to inform all elements.

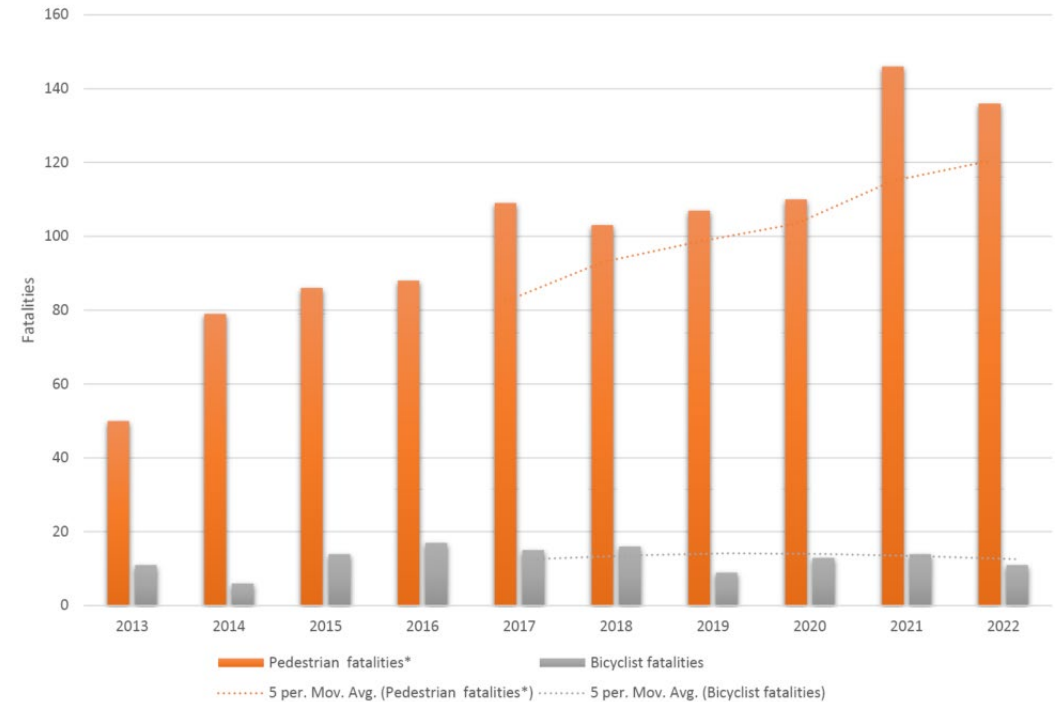


ACTIVE TRANSPORTATION SERIOUS AND FATAL CRASHES: UNACCEPTABLE TREND

Pedestrian and bicyclist suspected serious injuries in Washington State

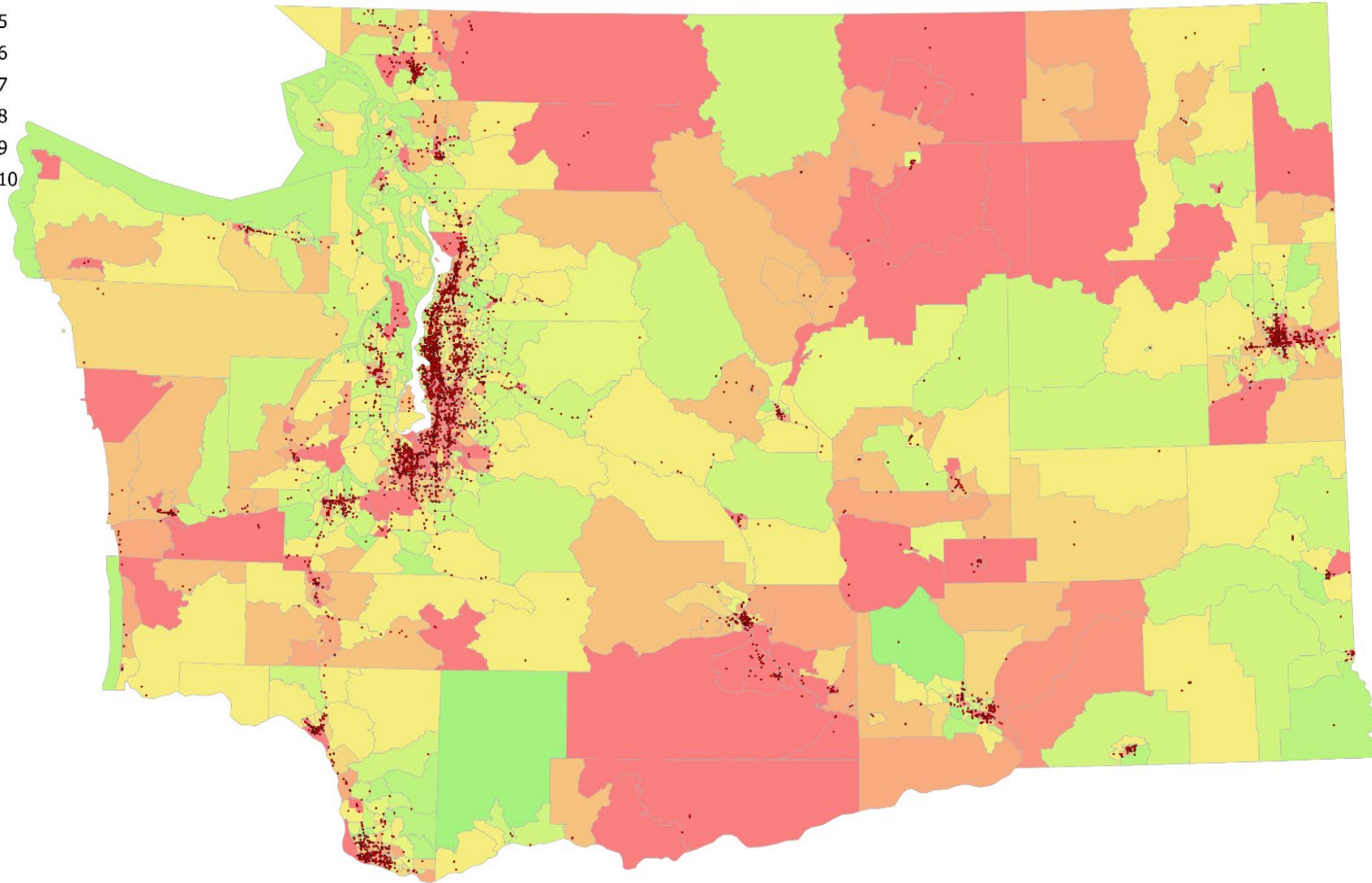
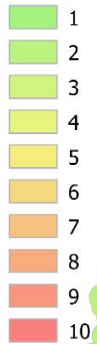


Pedestrian and Bicyclist Fatalities in Washington State



ACTIVE TRANSPORTATION AND EQUITY

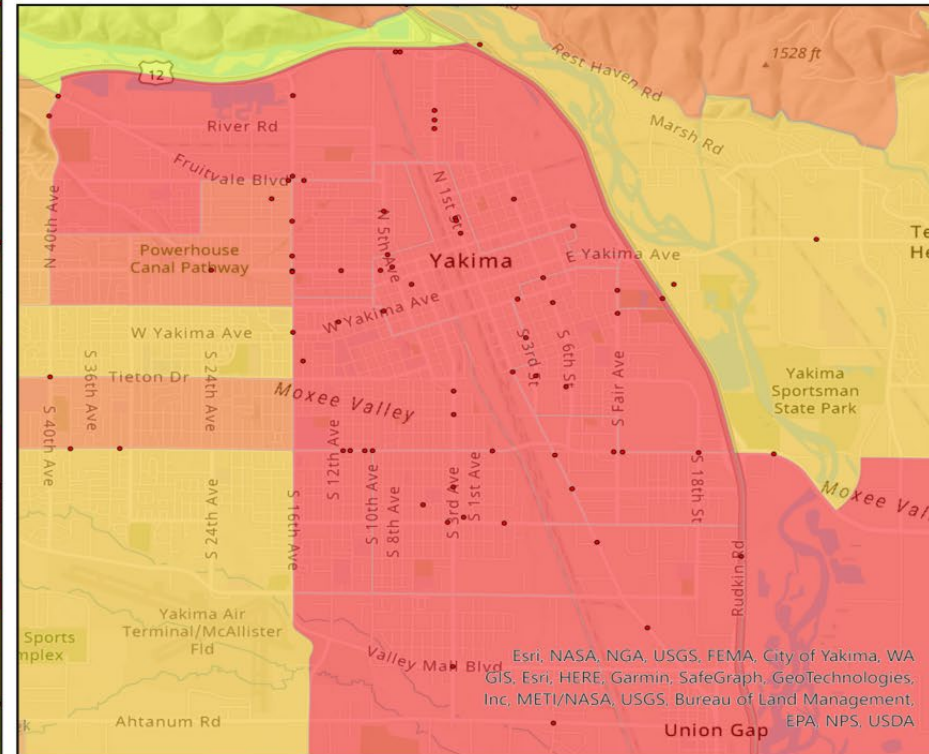
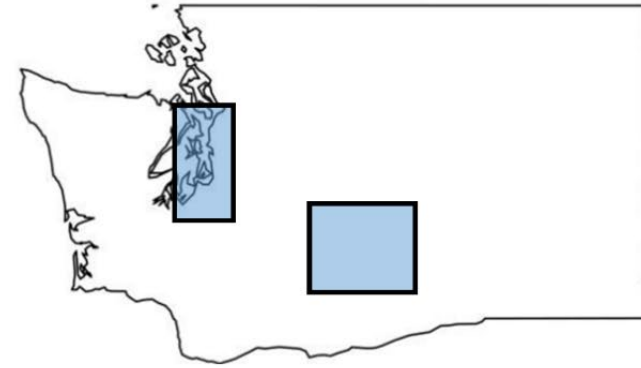
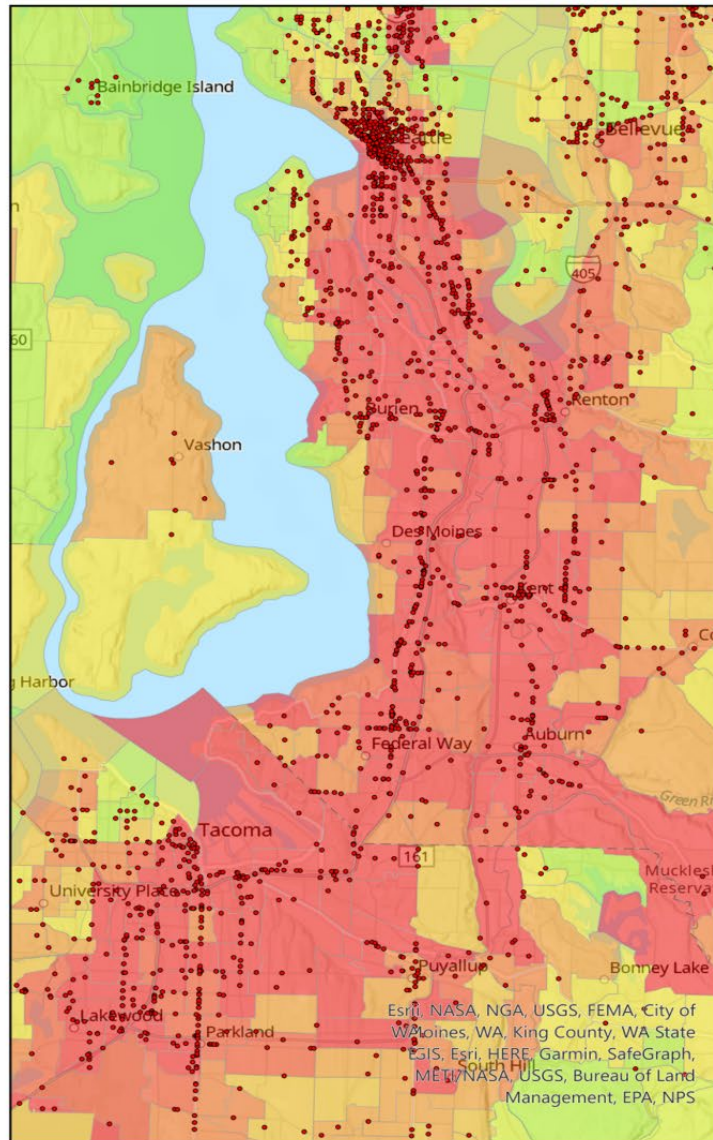
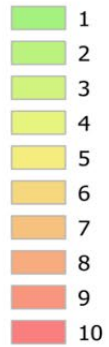
WSDOT VRU DEI Score



**"Do the best you can until you know better. Then when you know better, do better."
-Maya Angelou**

VRU ASSESSMENT EQUITY INDEX: KING AND YAKIMA COUNTY VIEW

WSDOT VRU DEI Score



Esri, NASA, NGA, USGS, FEMA, City of WA, Moines, WA, King County, WA State GIS, Esri, HERE, Garmin, SafeGraph, METI/NASA, USGS, Bureau of Land Management, EPA, NPS

Esri, NASA, NGA, USGS, FEMA, City of Yakima, WA GIS, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc. METI/NASA, USGS, Bureau of Land Management, EPA, NPS, USDA

SAFER LAND USE AND SAFER ROADS WORK TOGETHER IN A SAFE SYSTEM



Bothell Way – 2012 and 2021

Questions

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