ENHANCING TRAFFIC SAFETY IN SOUTH KING AND YAKIMA COUNTIES:

A Community Report

WA TRAFFIC SAFETY COMMISSION

MICHELIN
MOBILITY INTELLIGENCE

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OVERVIEW

The **WASHINGTON TRAFFIC SAFETY COMMISSION (WTSC)** leads efforts to save lives and prevent injuries on roadways across Washington state. More than 40,000 people are killed on our nation's roadways each year according to the U.S. Department of Transportation. In 2023, Washington reached its highest number of traffic deaths since 1990. In total, there were 810 traffic deaths in Washington state in 2023, a 10% increase from 2022. Every citizen in our state deserves the right to get home safely to their families and communities.

In partnership with the Washington Department of Transportation (WSDOT), WTSC updated the state's Target Zero plan, also known as the Strategic Highway Safety Plan. Target Zero is a data-informed, long-term plan to identify priorities and solutions, create goals, and develop a collective understanding among the agencies working to keep Washingtonians safe. The plan describes actions the state will take to reduce the number of traffic deaths and serious injuries on Washington roadways to zero by the year 2030.

As the population in Washington state continues to grow, WTSC is working to ensure its planning and goals for traffic safety reflect community insights, values and priorities. A key success factor in that effort includes building partnerships with community-based organizations to understand how to better engage and support communities, especially those disproportionately impacted by traffic crashes. It also involves engaging with industry leaders to ensure WTSC leverages the latest technologies and insights to improve safety outcomes.

TARGET ZERO is a data-informed, long-term plan to identify priorities and solutions, create goals, and develop a collective understanding among the agencies working to keep Washingtonians safe.

LEVERAGING PARTNERSHIPS TO PINPOINT TRAFFIC SAFETY RISKS

To that end, WTSC is actively engaged with the **GOVERNOR'S HIGHWAY SAFETY ASSOCIATION (GHSA)**, a group dedicated to helping states drive down traffic fatalities to zero deaths on our nation's roadways. In March 2024, GHSA offered a new grant program to advance the State Highway Offices' understanding and new use of data to help make the nation's roads safer for all users. The grants offered credits to work with **MICHELIN MOBILITY INTELLIGENCE**, a transportation technology division of Michelin that leverages near real-time traffic data insights to help public agencies get a clearer picture of the complex traffic safety issues on their road network and understand where to take action. The state of Washington was selected as a winner of the inaugural grant program and began their pilot safety project in spring 2024.

WHERE DO WE FOCUS TO MAKE THE BIGGEST DIFFERENCE IN STATEWIDE ROAD SAFETY?

To make the greatest positive impact on safety with limited resources, WTSC worked with Michelin Mobility Intelligence to focus on two historically underinvested counties in distinctly different areas of the state:

1. **SOUTH KING COUNTY** – The southernmost part of King County, with Burien and Renton making its borders in the northwest, running south of US-90 to the eastern border of King County. Vashon Island was not included in the scope of this study.

2. **YAKIMA COUNTY** – East of the Cascade Mountains including the Yakama Indian Reservation, the largest reservation in the state.

While demographically different, both communities are considered historically underinvested, as they are in underserved areas disproportionately impacted by traffic crashes. These areas have not necessarily benefited from previous public investments at the same levels as other areas of the state. Additionally, the WTSC wanted to study two counties that were high-risk because of socioeconomic factors.

Socioeconomic data is essential in reducing traffic crashes because it directly impacts factors that contribute to road safety risks. Economic disparities often mean lower-income areas have less access to well-maintained roads, pedestrian crossings, and proper
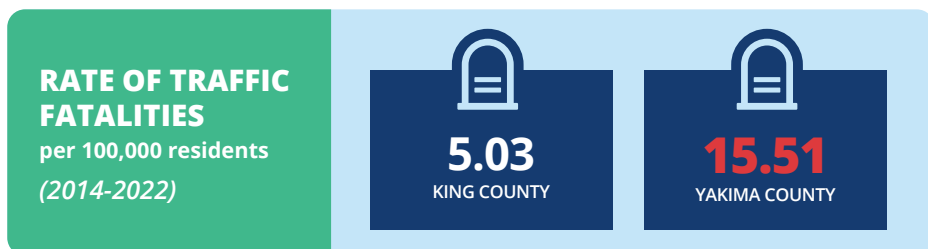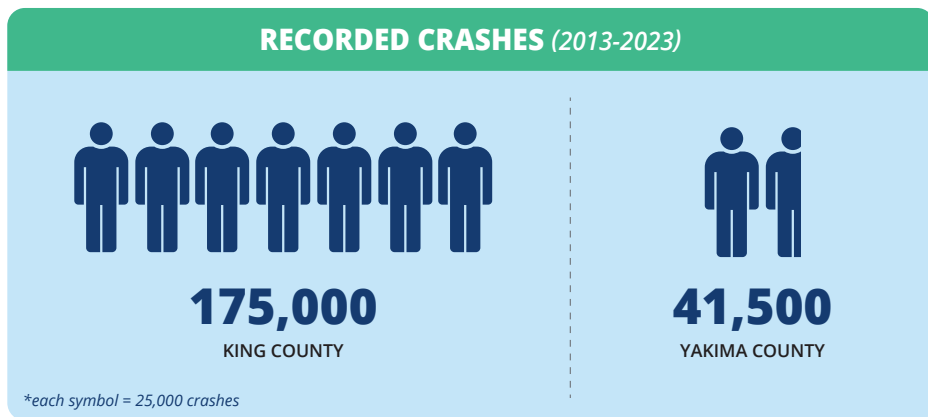
lighting, leading to higher crash rates. Additionally, public transit options may be limited, leading residents to rely more on walking and biking. Without frameworks supporting safe walking and biking, exposure to traffic dangers is higher. By identifying these gaps, agencies can direct resources toward safety improvements in high-risk communities.

Once these disparities and socioeconomic data are incorporated into decision-making, agencies can better allocate resources and design interventions specifically tailored to the unique needs of historically underinvested communities. They can ensure interventions target the communities most affected by traffic fatalities and injuries, and address root causes rather than symptoms.

CRASH HISTORY IN WASHINGTON

Traffic crashes are generally divided into fatalities, serious injury, minor injury, and property damage crashes, and have been a consistent, long-term issue throughout the state. In the past 10 years, there have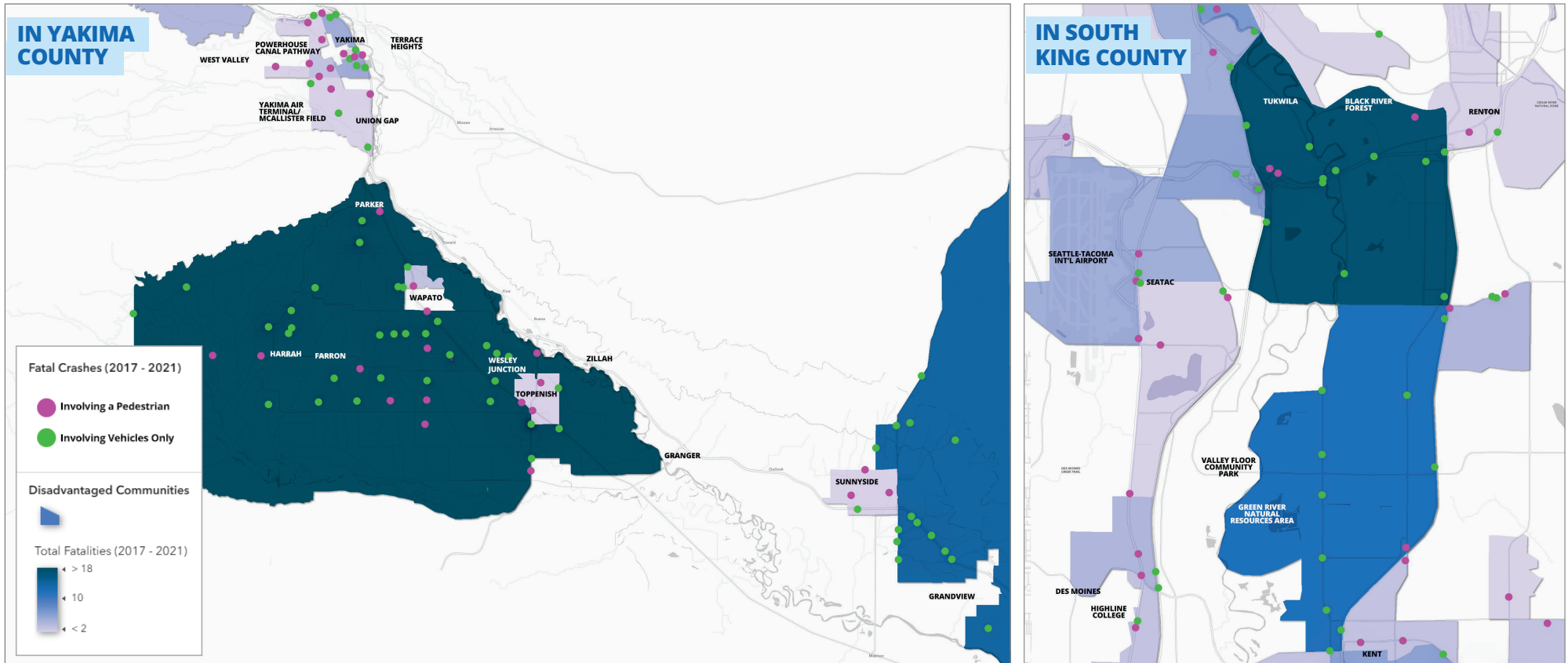 been 41,500 total crashes recorded in Yakima County and 175,000 total crashes recorded in South King County. South King County has seen a decline in crashes since a peak in 2016, stabilizing after 2021. Yakima's total traffic crash averages remain steady.

While King County has a recorded average lower than several other Washington State counties with 5.03 deaths per 100,000 residents, individual communities within King County may be more prone to traffic safety risks. Some, like South King County, may have higher fatality rates due to a lack of transportation investment and a history of marginalizing certain communities. Yakima County, the eighth largest by population, has a much higher rate of 15.51 deaths per 100,000 residents—nearly double the state average—highlighting traffic safety issues there.

Washington has been investigating why these areas, compared to other highly populated regions, experience disproportionately high levels of crashes and fatalities. This led to a hypothesis

CRASHES AND FATALITIES IN YAKIMA AND KING COUNTY

RECORDED CRASHES *(2013-2023)*

175,000
KING COUNTY

41,500
YAKIMA COUNTY

each symbol = 25,000 crashes

RATE OF TRAFFIC FATALITIES
per 100,000 residents
(2014-2022)

5.03
KING COUNTY

15.51
YAKIMA COUNTY

These maps show higher traffic fatalities in disadvantaged areas of South King and Yakima Counties, underscoring the need for targeted safety solutions.

that socioeconomic disadvantages contribute to overall traffic safety risks, prompting further exploration of solutions aimed at reducing these disparities.

The maps above illustrate a correlation between historically underinvested communities in South King and Yakima Counties and significantly higher rates of traffic fatalities, particularly among pedestrians.

This trend supports the theory that underserved or underdeveloped areas, which are often marked by economic disparities, limited access to safe infrastructure, and inadequate resources, face elevated traffic safety risks.

ECONOMIC DISPARITIES, *also known as economic inequality, refer to the unequal distribution of income, wealth, and opportunity among different groups in society.*

CONSIDERING HIGH-RISK AND OVERBURDENED COMMUNITIES

In South King County, areas in Kent and Renton were identified as highly disadvantaged with high crash rates. This region has a diverse population, including many low-income, immigrant, and refugee communities. Between 2016-2020, both Kent and Renton saw 14 fatal crashes, including multiple pedestrian deaths.

In South King County, Kent has been identified as a high-risk traffic safety area due to its large population of immigrants, high pedestrian activity, and dense traffic corridors. Auburn and Renton have also experienced elevated crash rates, especially involving vulnerable road users due to busy intersections, transit hubs, and mixed-use streets.

Yakima County also has high crash rates, particularly in areas near Toppenish, Wapato, and Union Gap. Collectively, these areas saw 70 traffic deaths, including 14 pedestrian fatalities, between 2016-2020. The county also experiences higher fatality rates for American Indian and Hispanic populations.

Although Yakima County is the eighth largest county in Washington by population, it has consistently been in the top six Washington counties for traffic fatalities, with a fatality rate nearly double the state average (15.51 versus the state average of 7.59 fatalities per 100,000 people).

DEFINING THE STUDY OBJECTIVES

Data and analysis serve as the cornerstone of traffic safety programs and enables WTSC and their stakeholders to continually evaluate and improve. Traffic safety professionals need access to complete and accurate information to create a fuller picture of nuanced traffic safety issues.

WTSC and Michelin partnered to combine traditional crash data and new driving behavior insights to get a more complete picture into high-risk areas in the road networks for South King and Yakima counties. These insights have been used to determine priority areas for potential safety improvements in line with community input to further reduce the risk of crashes on those road networks.

At the start of the study, WTSC identified four main objectives:

1 **OBTAIN NETWORK SCREENING ANALYSIS** for Yakima and South King counties to identify communities and areas identified as overburdened and historically underinvested. This analysis should clarify what types of driving behaviors are leading to crash hotspots, when they are occurring, and what communities they are affecting.

2 **USE THE RESULTS AS TOOLS TO GUIDE DISCUSSIONS** with community members and community-based organizations to share information about the types of driving behavior leading to crash or high-risk areas.

3 **CONFIRM ALIGNMENT** with community perceptions of risky areas with Michelin-identified high-risk locations. Focus on gaining communities' perspectives on the root causes leading to risky behaviors identified by the Michelin analysis.

4 **IDENTIFY AND IMPLEMENT PROJECTS** to improve the safety and community perception of safety in these high-risk areas.

Michelin analyzed driving behavior patterns and trends throughout the road network in Yakima and South King counties, looking at several factors:

VULNERABLE ROAD USERS (VRUs)

VRUs are people at a higher risk of getting hurt in traffic because they don't have the protection of a vehicle around them.

This group includes pedestrians, cyclists, motorcyclists, children, and people with disabilities.

HARD BRAKING

A sudden deceleration in speed. This feels like an immediate and strong reduction in speed, which can cause you to lurch forward in your seat.

HARSH ACCELERATION

A sudden increase in speed. This feels like a sudden jolt as the car surges forward and can push you back in your seat.

SPEED

Often called the "V85", this is the speed at or below 85 percent of the drivers travel on a road segment, used to determine the routine speed for that segment. In other words, if there are 100 cars driving on the road, the V85 speed is the speed that 85 of them are traveling at or below, while the remaining 15 are going faster.

Vehicles going above that routine speed by a significant amount can be characterized as atypical driving behavior.
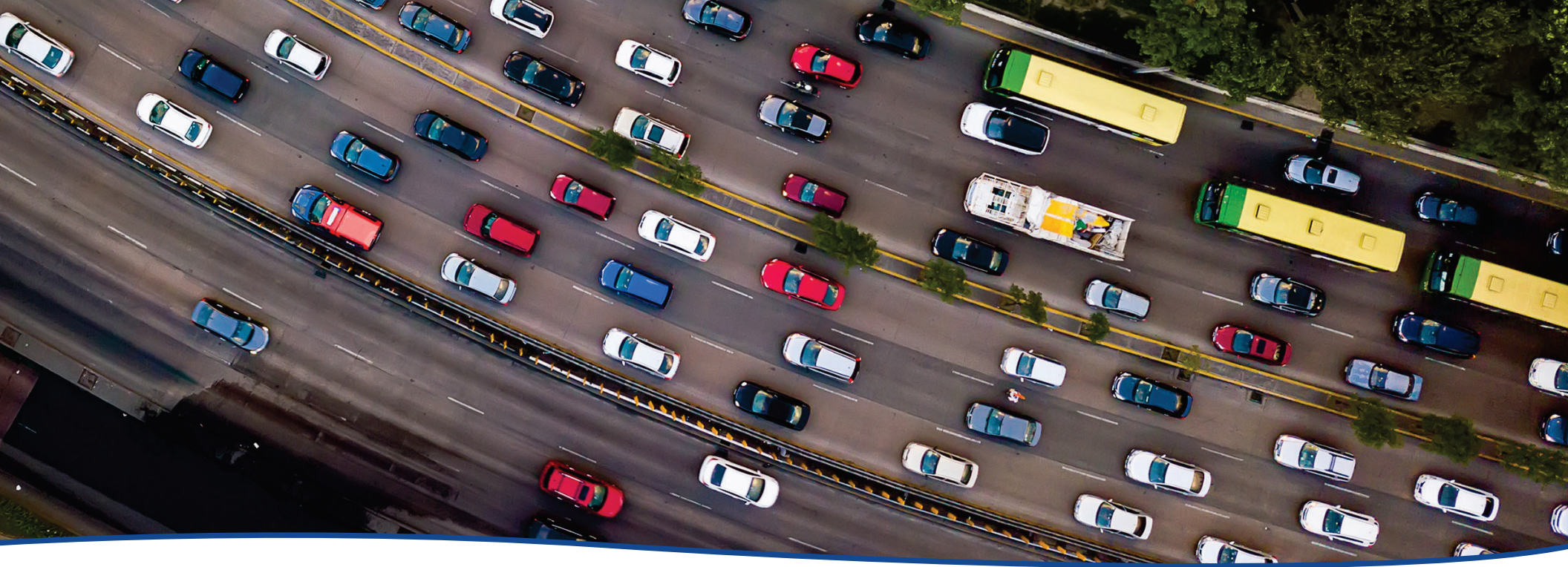
Looking at the risks and atypical driving behaviors, the study team developed a Driving Behavior Severity Ranking (DBSR) algorithm to identify higher-risk intersections or road segments where there were "clusters" of risky driving behaviors, such as hard braking or rapid acceleration.

For each event type, the algorithm scans the location and severity of incidents, identifying clusters where events occur repeatedly within a small area (like repeated hard braking near a stop sign). Spread-out events are less likely to form a cluster. Once clusters are defined, each one is assigned a "score" based on:

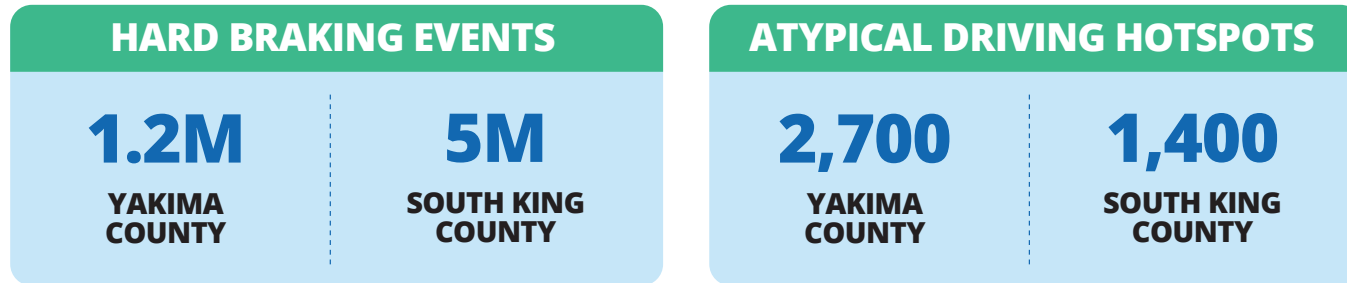- **EVENT INTENSITY:** Higher intensity or frequency increases the score.
- **TRAFFIC VOLUME:** Higher traffic volume decreases the score, as frequent events may reflect typical congestion.
- **CLUSTER SIZE:** More concentrated clusters receive higher scores than spread-out events.

These scores then determine each cluster's rank within the area, with the highest-scoring cluster ranked #1 and the lowest-scoring cluster as #5.

PROJECT FINDINGS ACROSS YAKIMA AND SOUTH KING COUNTIES

The study team analyzed more than 9,700 miles of road in Yakima County and 11,400 miles of road in South King County to determine higher-risk clusters, or "hotspots" and driving behavior trends. The data shows aggregated driving behaviors that determine risk: hard braking, harsh acceleration, driver speed and crash history.

The key figures from the analysis include:

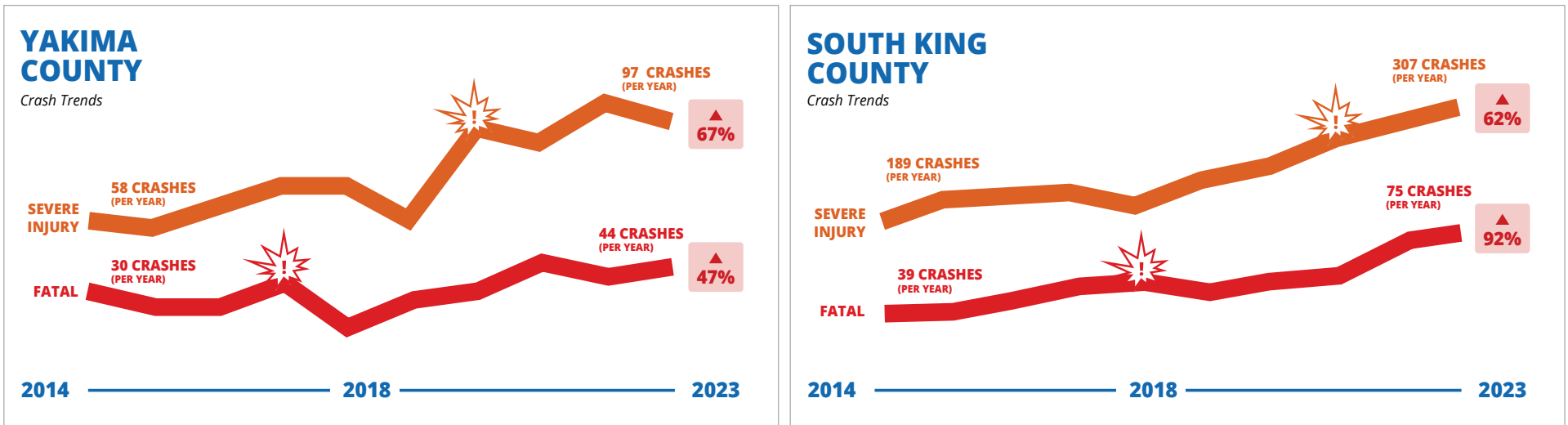| HARD BRAKING EVENTS		ATYPICAL DRIVING HOTSPOTS	
1.2M	**5M**	**2,700**	**1,400**
YAKIMA COUNTY	SOUTH KING COUNTY	YAKIMA COUNTY	SOUTH KING COUNTY

The study team analyzed 10 areas of focus for the study – determined by factors including crash history and community feedback – as areas for deeper analysis. Key themes emerged:

- **CRASH DATA DOESN'T TELL THE WHOLE STORY.** It's important to understand real-time risky driving behaviors in addition to crash history, so we can identify areas to study that might not show up on a mapped list of crashes. For example, in studying an 11-mile stretch of road in South King County, new hotspots of hard braking and acceleration emerged, as well as areas posing elevated risk to pedestrians and cyclists. It's also important to note that the type of crash gives us insight as well. For example, the total number of crashes in South King and Yakima counties are steady or declining, but severe crashes are increasing.

- **SPEED IS A MAJOR CONTRIBUTOR IN CLASSIFYING AN AREA AS HIGHER-RISK FOR SAFETY.** While multiple driving behaviors contribute to an area's risk factor, driver speed was a consistent theme in the study. For example, at the McDonald and South Wapato intersection in rural Yakima County, drivers are often approaching the stop sign at the intersection at 60 mph and over 25% of drivers did not fully stop at the stop sign.

- **CONTEXT IS IMPORTANT.** On South 1st Street and Sunnyside in Yakima County, 8 out of 10 drivers are going over the posted speed limit. While 20% of those drivers are going up to 5 mph over, which could seem modest, this area presents an elevated risk to VRUs because it's a mostly residential area with a major public park.

CRASH TRENDS

Crash history in the study areas can offer an initial indication of potential safety risks. South King County saw a decline in total yearly crashes since a 2016 peak and Yakima's trend in overall crashes remains steady. However, a closer look at the distinction between fatal and property damage crashes reveals a different story for both counties.

From 2014-2023 in South King County, there were 580 fatal and 2,372 severe injury crashes recorded. In fact, South King County saw a 11.2% decrease in annual crashes of all kinds from the start of the 10-year period to the end of the period, but a **92.3% INCREASE** in fatal crashes year over year. The pattern in Yakima County is similar although slightly less extreme. This means that while the total number of crashes might be steady or declining, **FATAL AND SEVERE CRASHES ARE ON THE RISE**.

YAKIMA COUNTY
Crash Trends

97 CRASHES
(PER YEAR)
▲ 67%

58 CRASHES
(PER YEAR)

SEVERE INJURY

30 CRASHES
(PER YEAR)

44 CRASHES
(PER YEAR)
▲ 47%

FATAL

2014 — 2018 — 2023

SOUTH KING COUNTY
Crash Trends

307 CRASHES
(PER YEAR)
▲ 62%

189 CRASHES
(PER YEAR)

SEVERE INJURY

75 CRASHES
(PER YEAR)
▲ 92%

39 CRASHES
(PER YEAR)

FATAL

2014 — 2018 — 2023

Comparison of yearly average crash data for Yakima and South King County, showing trends from 2014-2016 and 2021-2023. Although we see the number of crashes staying steady in Yakima County and decline in South King County, the number of severe injury crashes has dramatically increased in both communities.

SOUTH KING COUNTY FOCUS AREAS

The study team focused on four areas in South King County that were identified as potential areas for safety improvements for vulnerable road users (VRUs) such as pedestrians and bicyclists.
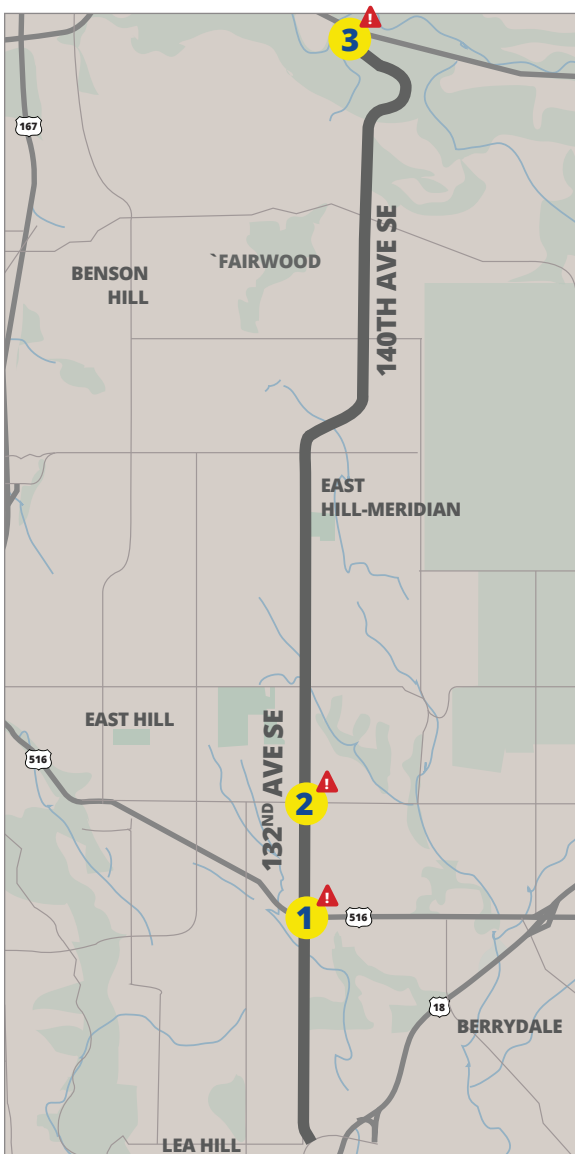
FOCUS AREA 1

Identifying High-Risk Driver Behavior Hotspots on the Corridor From 140th Avenue SE To 132nd Avenue SE

AREA DESCRIPTION: An 11-mile corridor along 132nd Avenue, where the posted speed limit for the corridor is 40 mph headed north and 35 mph headed south.

AREA SELECTION: WTSC has received considerable feedback from the community, asking to make the roadway safer overall.

STUDY OBJECTIVE: The goal in studying this area is to understand risky driving behavior patterns and where they are most severe along this corridor.

Road segments within the 11-mile corridor were ranked based on driving behaviors. Overall, the northern part of the corridor has the highest-ranking clusters of risky driving behavior. The northern side also has the highest-severity harsh acceleration clusters and the highest number of acceleration clusters overall. Eighty-five percent of drivers traveling on this road are consistently driving 10 -15 mph above the posted speed limit, resulting in emergency braking. This means that 15% of drivers are driving even further beyond the posted speed limit.

As seen in the chart on page 15, the project team assigned severity values from 1-5 across each road segment. For example, with speeding, the team compared the V85 to the posted speed limit on each segment. Areas where the V85 greatly exceeds the posted speed limit receive higher severity value. This approach is also used to rank other risk factors, such as driving events and crash history, to provide a consistent risk assessment across various metrics.

Additionally, the study team analyzed where there might be an elevated risk to VRUs such as pedestrians and bicyclists. Using a machine learning model, Michelin generates location signatures that incorporate mobility metrics, like traffic volume, driving speed, and historical crash data. By analyzing similarities between these signatures, the model assesses the likelihood of VRU collisions to pinpoint road segments with an elevated risk. When combined with driving behavior insights, the VRU analysis helps identify areas where vulnerable road users are at an elevated risk. Areas with a higher elevated risk received a 5 rating, and areas with little or no risk to VRUs received a 0.

There is elevated risk to pedestrians and cyclists at several locations in this corridor, **such as these three locations:**

ELEVATED PEDESTRIAN RISK

ELEVATED PEDESTRIAN & CYCLIST RISK

ELEVATED CYCLIST RISK

SE 272ND STREET contains four segments with a VRU risk rating of 5 *(the highest on Michelin's risk model).* The intersection is signal-controlled with a high frequency of hard braking from traffic traveling west.
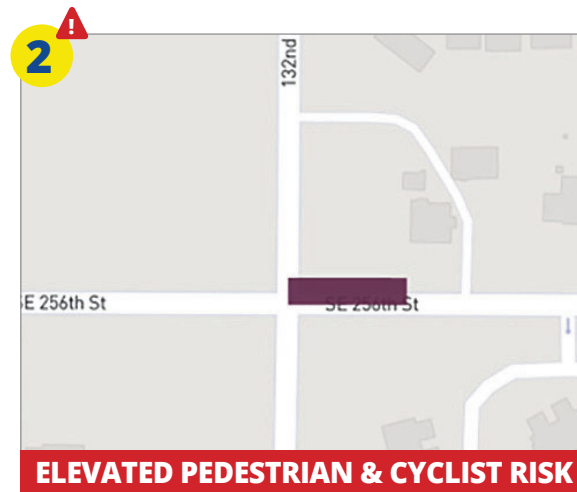
SE 256TH STREET is a higher risk for pedestrians and cyclists.
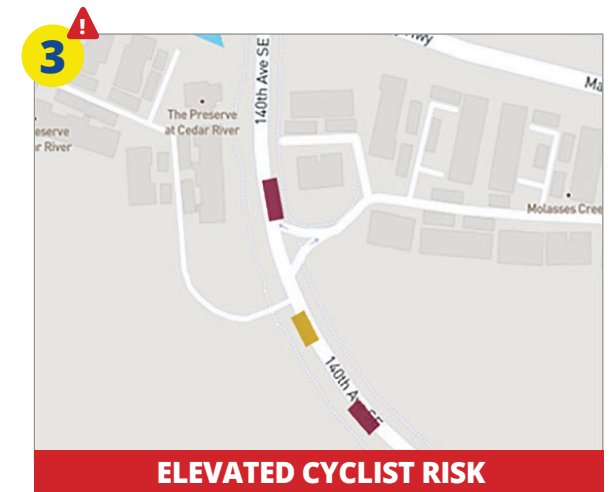
NEAR 140TH WAY SE is a higher risk for cyclists.

RISKIEST ROAD SEGMENTS

Corridor from 140th Avenue SE to 132nd Avenue SE *(South King County)*

	Braking Behavior Severity (Rank)	Acceleration Behavior Severity	Speeding	VRU Crash Risk	Crashes (Since 2020)	Total Risk Score:
BEFORE SE 158TH ST.	⚠⚠⚠⚠⚠	⚠⚠⚠⚠⚠	(8-10 MPH) ⚠⚠⚠⚠⚠	⚠⚠⚠⚠⚠	⚠⚠⚠⚠⚠	**19**
FAIRWOOD GOLF	⚠⚠⚠⚠⚠	⚠⚠⚠⚠⚠	(10+ MPH) ⚠⚠⚠⚠⚠	⚠⚠⚠⚠⚠	⚠⚠⚠⚠⚠	**15**
SE 192ND ST.	⚠⚠⚠⚠⚠	⚠⚠⚠⚠⚠	(8-10 MPH) ⚠⚠⚠⚠⚠	⚠⚠⚠⚠⚠	⚠⚠⚠⚠⚠	**15**
SE 240TH ST.	⚠⚠⚠⚠⚠	⚠⚠⚠⚠⚠	(5-7 MPH) ⚠⚠⚠⚠⚠	⚠⚠⚠⚠⚠	⚠⚠⚠⚠⚠	**15**
SE 272ND ST.	⚠⚠⚠⚠⚠	⚠⚠⚠⚠⚠	(7-8 MPH) ⚠⚠⚠⚠⚠	⚠⚠⚠⚠⚠	⚠⚠⚠⚠⚠	**12**
NORTHERN CURVE	⚠⚠⚠⚠⚠	⚠⚠⚠⚠⚠	(7 MPH) ⚠⚠⚠⚠⚠	⚠⚠⚠⚠⚠	⚠⚠⚠⚠⚠	**11**
SE 200TH ST.	⚠⚠⚠⚠⚠	⚠⚠⚠⚠⚠	(4-5 MPH) ⚠⚠⚠⚠⚠	⚠⚠⚠⚠⚠	⚠⚠⚠⚠⚠	**7**
SE 266TH ST.	⚠⚠⚠⚠⚠	⚠⚠⚠⚠⚠	(7-8 MPH) ⚠⚠⚠⚠⚠	⚠⚠⚠⚠⚠	⚠⚠⚠⚠⚠	**7**

**EVENTS** — **SPEED** — **CRASH RISK**

Overall Takeaways for South King County Focus Area 1:

1 There is frequent speeding all along the corridor.

2 In the northern half of the corridor, severe abnormal braking behavior is observed at many intersections.

3 On the southern portion of the corridor, hard braking behavior is still happening at intersections, but this behavior is generally less severe and closer to typical trends.

4 Crashes are very common in the Fairwood area, but in general are of lower severity than in other areas. Crashes often happen frequently at and north of Kensington Heights, and at the intersection with SR 516. High severity crashes often happen between Fairwood and WA 169.

DATA DISCOVERY:

The crash history doesn't tell the full story. After combining the crash history with driving behaviors, the data showed that driving behaviors such as hard braking or sudden acceleration are contributing factors to identifying an area with risky driving behavior.
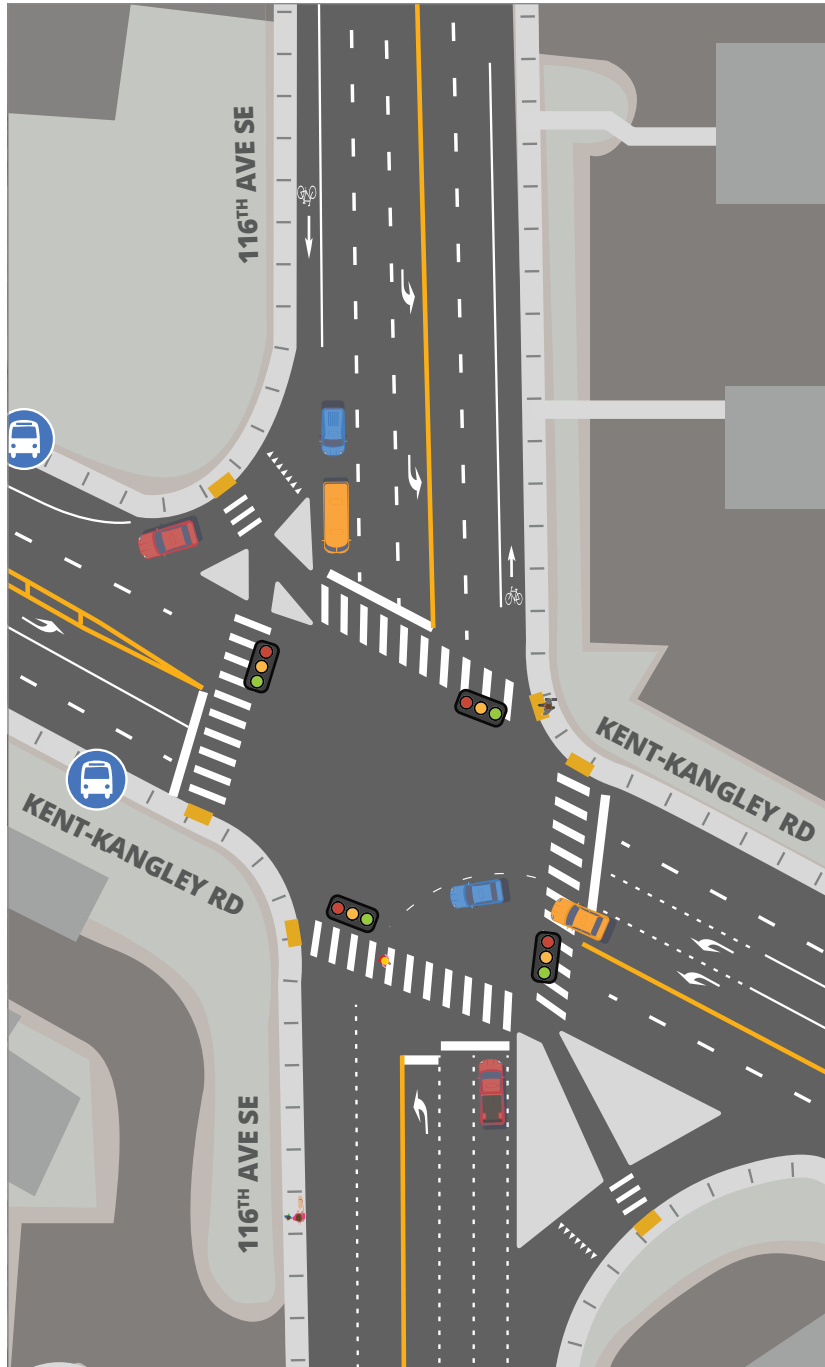
FOCUS AREA 2

Describing High-Risk Driver Behavior at the Kent-Kangley Road and 116th Avenue Intersection

AREA DESCRIPTION: Area of Kent-Kangley Road that intersects with 116th Avenue SE, midway between Kent and Covington. The intersection is complex with multiple turn lanes that cross pedestrian walkways and have a high amount of traffic. There are several restaurants, gas stations and shopping centers.

AREA SELECTION: Corridor was identified for analysis by the King County Traffic Safety task force based on considerable community feedback.

STUDY OBJECTIVE: Quantify high risk behaviors leading to elevated VRU and vehicle-to-vehicle crash risk at this intersection.

The analysis of this intersection resulted in finding a number of safety risk factors. Drivers are accelerating more aggressively than usual to get up to speed with traffic. This is dangerous because:

- Oncoming traffic is generally traveling well above the posted speed limit, creating a sense of urgency for drivers trying to merge.

- This rapid acceleration creates elevated risk to pedestrians going across these turn lanes, as well as to drivers trying to turn into and out of stores, gas stations, restaurants, and the bus stop nearby.

Drivers going east and west on Kent-Kangley Road regularly exceed the posted speed limit by a significant amount. Data collected from the east of the intersection (for drivers going in either direction) show routine speeds of 10-15 mph over the posted speed limit of 35 mph, and data from the west of the intersection show routine speeds of 8-10 mph over the posted speed limit. Secondly, at the intersection, the speeds dip to about 15 mph for drivers turning right onto Kent-Kangley westbound but are back up to 32 mph within 200 feet, indicating significant acceleration past the bus stop in that area. This behavior creates elevated risk for VRU as well as vehicle-to-vehicle (V2V) crashes.

!

DATA DISCOVERY:

Traffic turning onto a street where speeds are abnormally high often creates the need for abrupt acceleration and other risky driving behaviors, which can lead to especially high risk for pedestrians in high foot traffic areas.

Overall Takeaways for South King County Focus Area 2:

1 This intersection has abnormally severe acceleration behavior on both right-turn lanes onto Kent-Kangley Road, which is coupled with risk to pedestrians partially due to crosswalks crossing these turning lanes.

2 Although there is still risk to pedestrians in these areas, most of the harsh acceleration happens after cars are past the crosswalk in the turning lane.

3 A potential cause for the elevated harsh acceleration is the speed going both ways on Kent-Kangley Road – the V85 speed of drivers on Kent-Kangley going past where the turning lane enters is between 35 and 40 mph. This creates a situation where drivers turning need to accelerate quickly once they leave the turning lane.

4 Complicating factors exist after both turn lanes – for the northern turn lane, there is a bus stop within 100 feet of the turn lane. For the southern turn lane, there are entrances to both a gas station and a car wash/shopping center on either side of the road in about the same distance.

5 Ultimately, braking patterns on Kent-Kangley Road before and around where the turning lanes enter indicate that there aren't as many near misses as we might expect from the acceleration patterns, but the acceleration patterns alone indicate the presence of both V2V and pedestrian crash risk.

6 Efforts to reduce speed on Kent-Kangley Road approaching the intersection from either direction, or to change the yield sign on the southern turn lane to a no-turn-on-red sign, could have a positive effect on reducing crash risk in this intersection.

FOCUS AREA 3

Hard Braking and Acceleration at the Sunset Boulevard and NE 3ʳᵈ Street Intersection
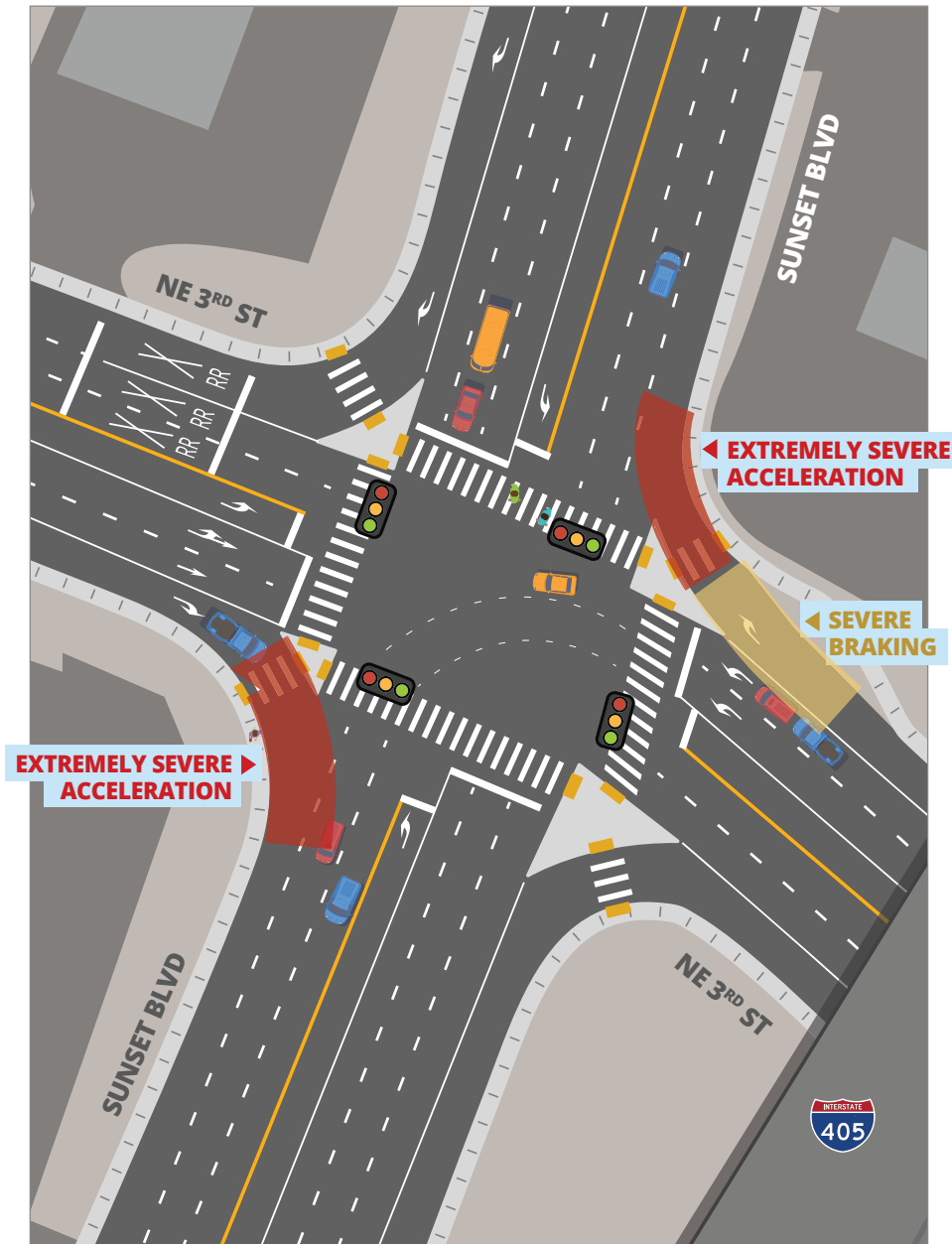
AREA DESCRIPTION: This is a high traffic area that has posted speed limits between 30 and 35 mph. There is a railroad parallel to Sunset Boulevard and traffic lights at all the intersections in the surrounding area.

AREA SELECTION: This area was identified through the project team's network screening as an area that should be studied.

There have been over 50 crashes in this area, likely correlated to the high amount of traffic, the stop-and-go nature of driving through this area and frequent instances of merging onto this road. Through the data analysis, the team observed clusters of hard braking and harsh acceleration at the intersection between Sunset and 3ʳᵈ Street in the turn lane going from east to north, and harsh acceleration in the turn lane going from west to south.

Even more so than the harsh acceleration patterns observed in the turn lanes in the Kent-Kangley Road focus area, the intersection showed acceleration patterns that carry elevated risk to pedestrians in walkways across these turn lanes, as harsh acceleration frequently occurred at and even before where the walkways are located.

Overall Takeaways for South King County Focus Area 3:

1 Severe braking events are abnormally common near the Sunset Boulevard and 3rd Street intersection.

2 Severe acceleration events happen abnormally often in and after the turn lanes onto Sunset Boulevard..

3 Overall, this area sees a high number of crashes.

4 There is some speeding in this area, especially on NE 3rd Street while driving east.

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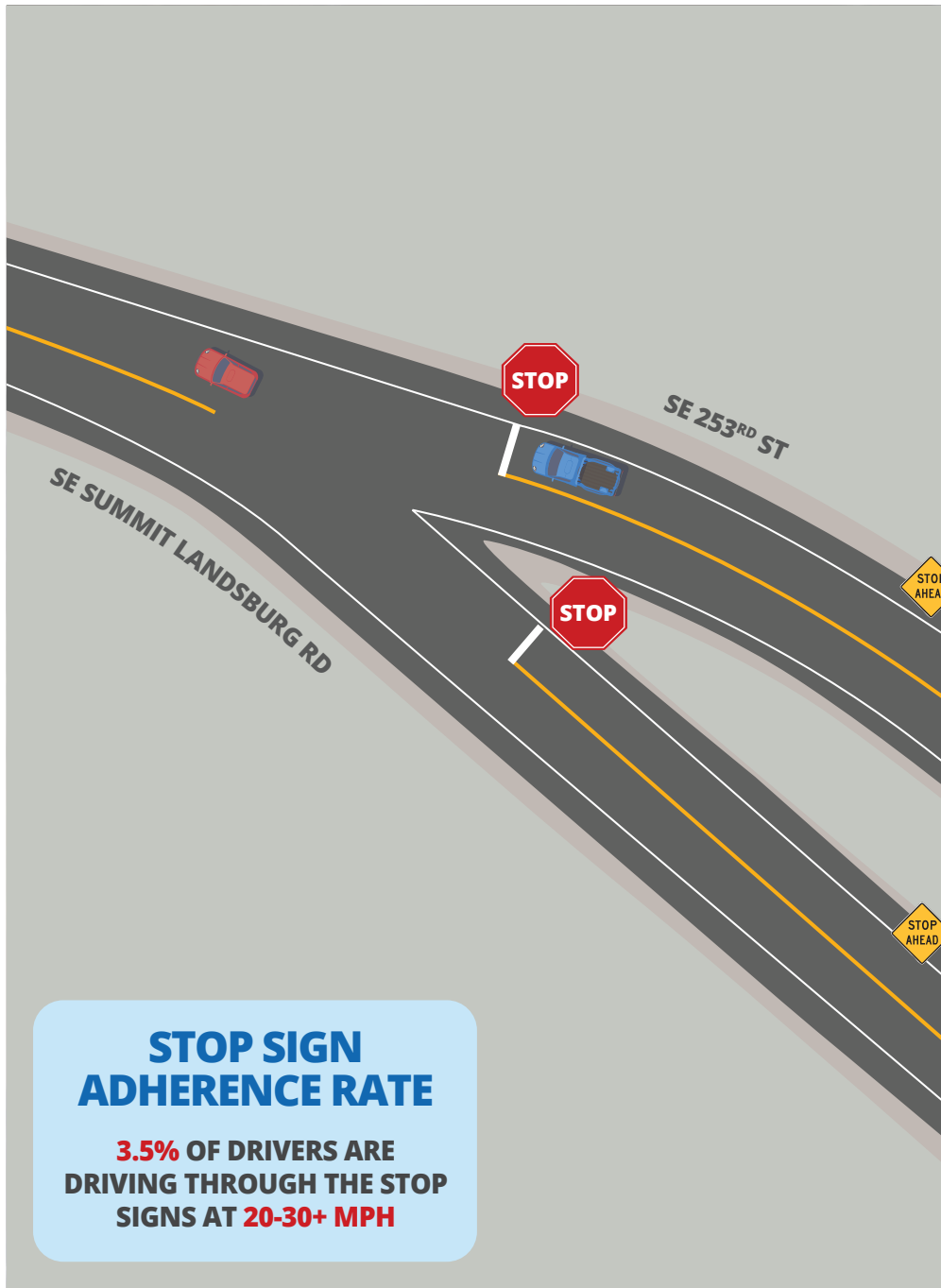
STOP SIGN ADHERENCE RATE

3.5% OF DRIVERS ARE DRIVING THROUGH THE STOP SIGNS AT 20-30+ MPH

FOCUS AREA 4

Speeding and Stop Sign Adherence at the SE Summit Landsburg and 253rd Street Intersection

AREA DESCRIPTION: Located east of Maple Valley and south of Hobart. Drivers traveling westbound from either SE Summit Landsburg Road or SE 253rd Street encounter a stop sign. There is elevated hard braking at both locations.

AREA SELECTION: This area was identified through the project team's network screening as an area that should be studied.

STUDY OBJECTIVE: An elevated risk if drivers on SE Summit Landsburg fail to stop.

The V85 vehicle speed significantly exceeds the posted speed limit on both westbound approaches to the intersection. Fifteen percent of drivers on SE Summit Landsburg Street drive 20 mph or more over the posted speed limit, while 15% of drivers on 253rd Street exceed the posted speed limit by 10-15 mph. Excessive driver speeding contributes to the severe braking behavior observed in the area.

The start of deceleration for westbound traffic closely aligns with the placement of "Stop Ahead" signs. However, the sharp braking behavior suggests that drivers may not be adequately prepared to slow down in time.

Overall Takeaways for South King County Focus Area 4:

1 This intersection has abnormally severe braking behavior on both westbound roads.

2 This is partially related to the excessive speeding behavior frequently seen, with a V85 of 20 mph over the posted speed limit for most of the stretch of Summit Landsburg Road heading westbound to the intersection, and with a V85 of 10-15mph over the posted speed limit for much of 253rd westbound towards the intersection.

3 The speeding issue is likely compounded by the somewhat unexpected location and unusual configuration of the stop signs. Traffic tends to start slowing down sharply very near where the "Stop Ahead" signs are located.

4 A change in signage or signage location could help prepare drivers to start slowing down sooner.

YAKIMA COUNTY FOCUS AREAS

The study team analyzed six focus areas as potential areas for safety improvements for drivers, pedestrians, and bicyclists.

FOCUS AREA 1

City of Yakima Intersection Crash Analysis Combined with MMI Analysis

AREA DESCRIPTION: The Yakima City Police Department traffic unit provided crash counts for 22 intersections within the city boundaries.

AREA SELECTION: This area was included in the study after requests from the community identified this as an area of concern.

STUDY OBJECTIVE: The intersections in the City of Yakima have varied risk levels, determined by a framework that includes driving behavior and crash counts. The team wanted to determine areas with the highest potential for improvement.

The study team compared the ranking of crash counts (high to low), an approach often used by law enforcement and engineers to identify areas with the highest potential for improvement, to a driver behavior-based risk ranking. Michelin then applied a framework to classify the 22 intersections into one of five Risk Groups, ranging from Risk Group 5, which had the riskiest driving behavior from the most directions approaching an intersection, all the way down to Risk Group 1, which had the least risky driving behavior.

INTERSECTION	# OF CRASHES	% WITH INJURY	RISK GROUP
1. 16th Ave & Fruitvale Blvd	20	20%	5
2. 6th St & Nob Hill Blvd	17	18%	5
3. 3rd Ave & Nob Hill Blvd	23	13%	5
4. Fair Ave & Nob Hill Blvd	24	13%	5
5. 16th Ave & Lincoln Ave	24	13%	5
6. 1st St & Lincoln Ave	20	10%	5
7. 32nd Ave & Nob Hill Blvd	17	6%	5
8. Custer Ave & Lincoln Ave	16	25%	4
9. 3rd Ave & Yakima Ave	18	22%	4
10. 5th Ave & Yakima Ave	23	13%	4
11. 16th Ave & Nob Hill Blvd	46	11%	4
12. 1st St & Washington Ave	15	7%	4
13. 1st St & D St	19	5%	4
14. 40th Ave & Summitview Ave	26	4%	4
15. 18th St & Nob Hill Blvd	15	13%	3
16. 1st St & Yakima Ave	18	11%	3
17. 3rd Ave & Lincoln Ave	19	11%	3
18. 40th Ave & Fruitvale Blvd	20	10%	3
19. 16th Ave & Tieton Dr	16	6%	3
20. 16th Ave & Summitview Ave	15	13%	2
21. 1st St & Nob Hill Blvd	26	12%	2
22. 1st St & Mead Ave	23	4%	1

Analyzing Risky Driving Patterns: *A comprehensive review of key intersections in Yakima County highlights areas with risky driving behaviors and elevated risks for crashes, emphasizing the need for safety improvements.*
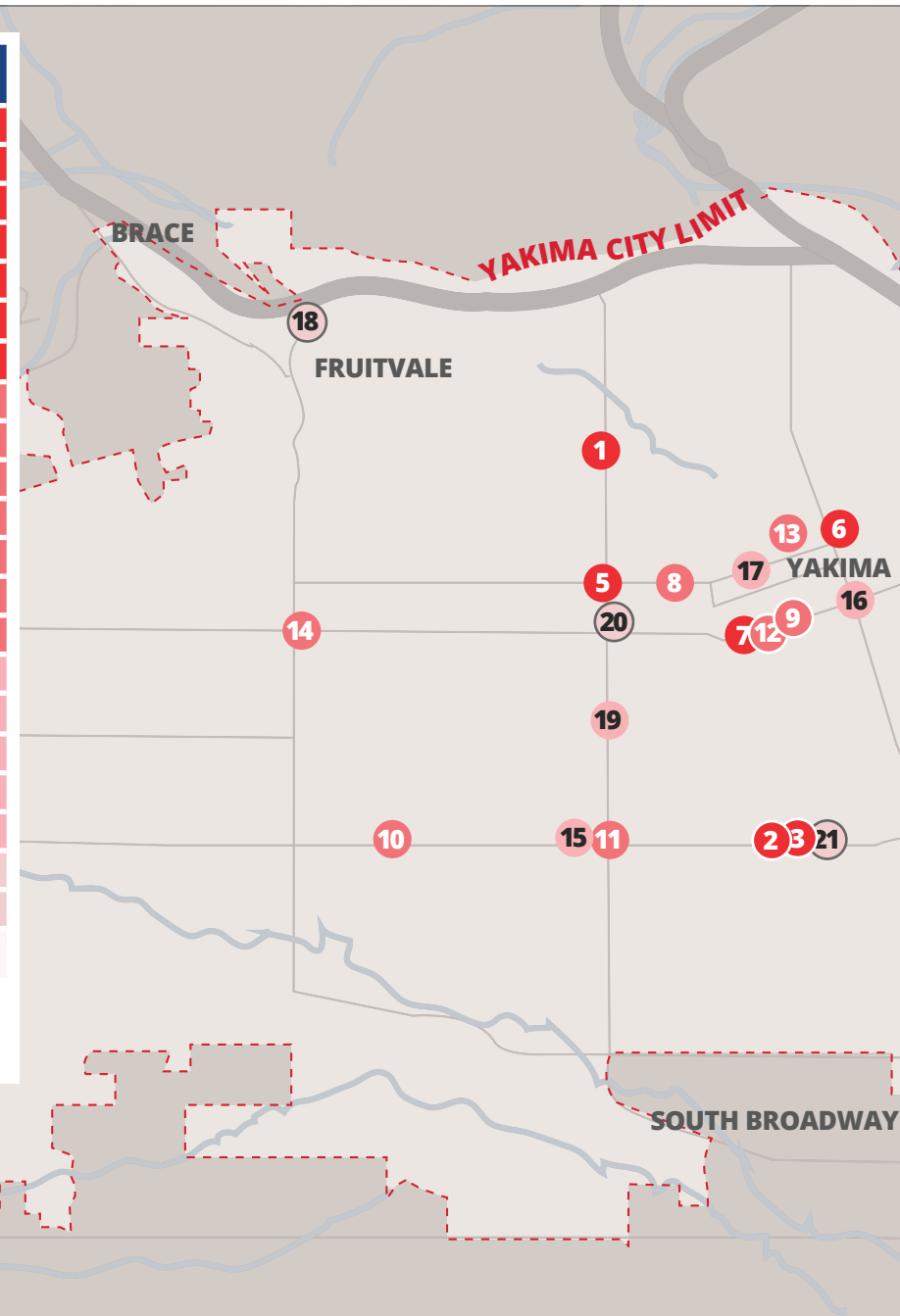
This classification by driving behavior gives new insight beyond identifying risk by crash count. This Risk Group classification system proved extremely effective at identifying areas where there was a history of a crash involving a serious or fatal injury, as shown in the table to the right.

RISK GROUP	# OF CRASHES	% WITH SEVERE INJURY/ FATALITY
5	145	4.1%
4	163	3.7%
3	88	1.1%
2	41	0%
1	23	0%

The new driving behavior analysis revealed new hotspots surrounding intersections such as Powerhouse Road and North 34th Avenue, where several aspects of the intersection exhibited atypical driving behavior such as hard braking and risk to vulnerable road users.

When the study team completed their analysis, 14 of the 22 intersections were classified as having high levels of risky driving behavior. This additional data shows that crash data alone does not give a complete picture and, when driving behavior data was added to the analysis, the study team identified additional intersections with no crash history that have high levels of risky driver behavior that are predictive of future serious crashes.
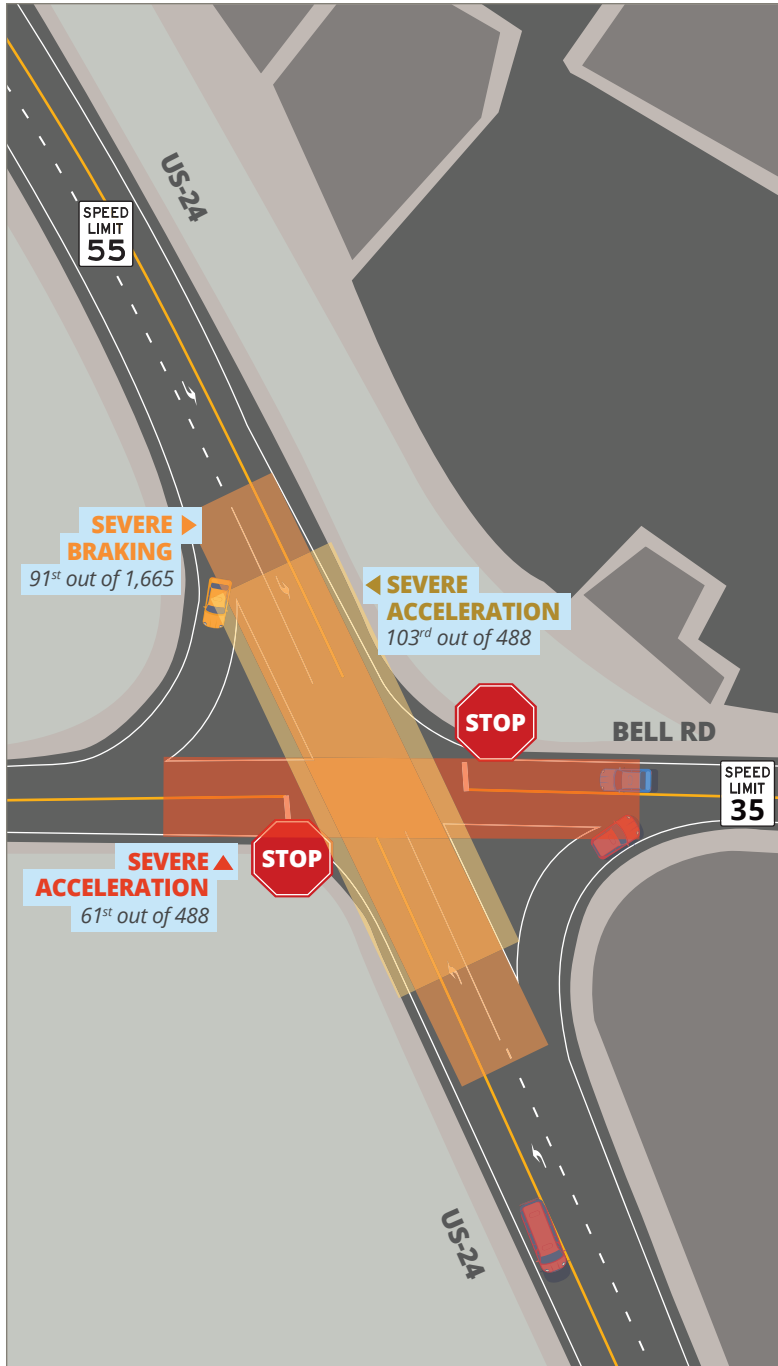
Overall Takeaways for Yakima County Focus Area 1:

1 The intersections with the most severe driving behavior have some overlap with the 22 high-crash intersections, but other intersections outside of these 22 were also identified as risky due to severe driving behavior.

2 Analysis of driver behavior combined with crash history data tells a more complete picture in identifying areas for safety improvements than either approach alone.

DATA DISCOVERY:

Analysis of driving behavior patterns leads to a better understanding of risk at intersections than crash history alone, not just in understanding how likely a crash is to lead to injury, but also how likely a crash is to lead to a severe or fatal injury.

4

22

UNION GAP

SPEED LIMIT **55**

US-24

SEVERE ▶ BRAKING
91st out of 1,665

◀ SEVERE ACCELERATION
103rd out of 488

STOP

BELL RD

SPEED LIMIT **35**

STOP

SEVERE ▲ ACCELERATION
61st out of 488

US-24

FOCUS AREA 2

Speed and Hard Braking at the US-24 and Bell Road Intersection on Moxee Highway

AREA DESCRIPTION: This is an intersection between US 24 and Bell Road on Moxee Highway.

AREA SELECTION: This area has been identified as an area of concern by the community.

STUDY OBJECTIVE: The intersection is between one high-speed road (55 mph posted speed limit) and a low-speed road (35 mph). This type of intersection often has risky acceleration from drivers turning onto the higher-speed road and hard braking from drivers traveling on the higher speed road. The study team set out to determine the level of risk in this intersection.

Drivers turning onto the higher-speed US 24, which has a posted speed limit of 55 mph, often accelerate aggressively, while those already on the highway brake sharply due to merging traffic. This creates clusters of severe driving behavior, particularly with harsh acceleration and hard braking. The community has identified this as an area of concern.

Using advanced technology, Michelin runs a risk model that looks at key factors like road design, traffic patterns, nearby attractions, and crash history to find similar locations where crashes could happen.

The model identifies two different types of risk: vehicle crash risk and risk to Vulnerable Road Users (VRUs). This information helps us focus on improving safety in the areas that need it most. While this location was identified as an area of concern by the community, the Model did not highlight any severe risks in this corridor, and there are no major differences in driving patterns between day and night.

Drivers typically maintain speeds about 5 mph over the limit, which is consistent with typical behavior for the area. The data reveals that while there are clusters of acceleration and braking, especially at the intersection, overall driving behavior is relatively standard for this type of infrastructure. However, the disconnect between community perception and the actual data indicates that while the area feels risky, the data suggests that the driving behaviors align with normal patterns for such intersections. WTSC may consider improvements that mitigate the merging speeds into the oncoming higher speed traffic to improve community perception of safety at this intersection.
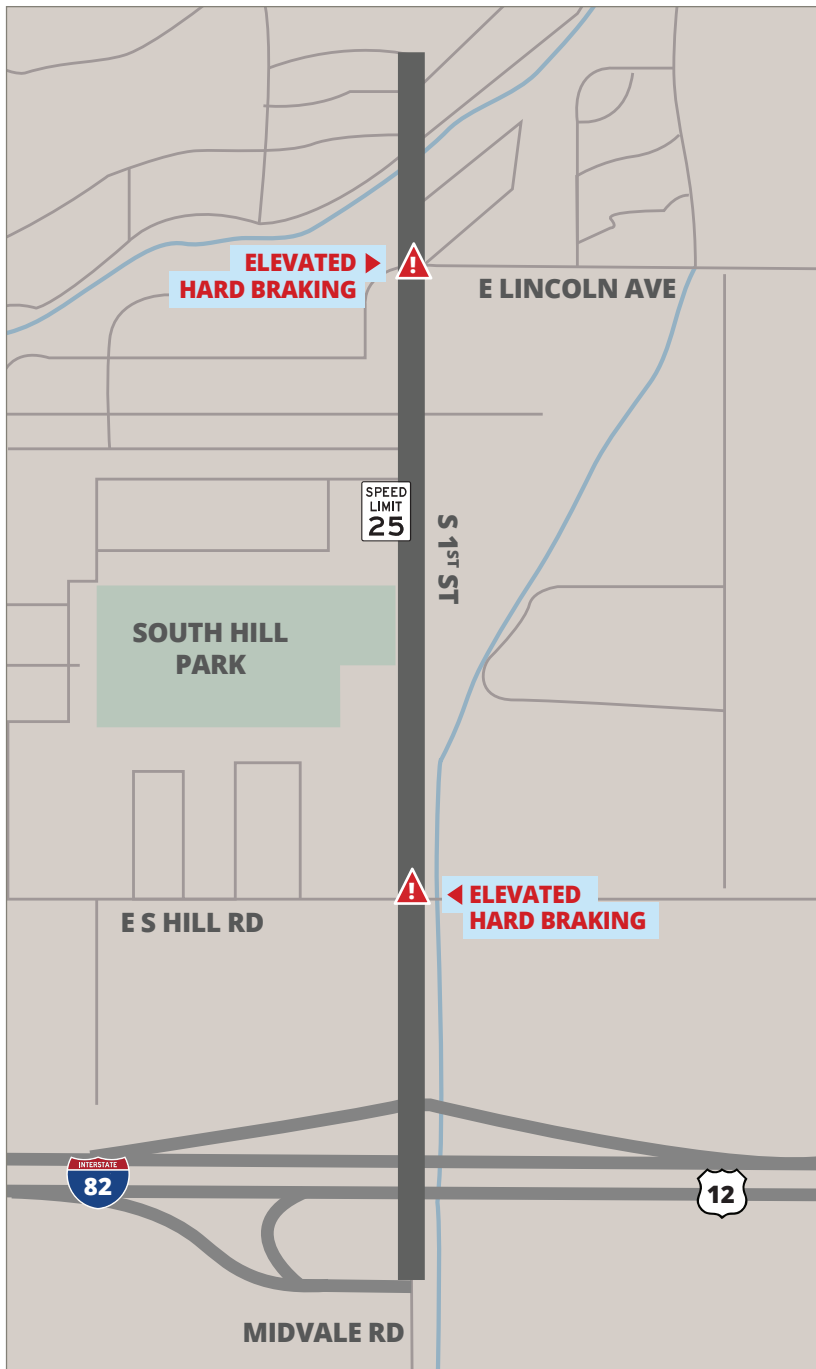
Overall Takeaways for Yakima County Focus Area 2:

1 There are some areas of risk, especially among drivers looking to cross or turn onto US-24 from Bell Road, specifically from the east.

2 Although no areas were flagged as high VRU risk, in at least one area, speed and braking analysis indicated impact of pedestrian crosswalk on driving behavior.

3 Generally, this corridor does not have as much abnormal driving behavior as some other, riskier areas.

4 No significant speed difference from weekdays to weekend days.

!

DATA DISCOVERY:

Although this area of focus has a history of crashes as well as some severe driving behavior patterns, behavior in this area is relatively standard for this type of infrastructure, indicating that community perceptions of safety in an area are not always aligned with the real driving behavior in that area.

ELEVATED ▶ HARD BRAKING

E LINCOLN AVE

SPEED LIMIT **25**

S 1ST ST

SOUTH HILL PARK

E S HILL RD

⚠ **◀ ELEVATED HARD BRAKING**

INTERSTATE **82**

12

MIDVALE RD

FOCUS AREA 3

Speeding and Hard Braking Along the South 1st Street Corridor in Sunnyside

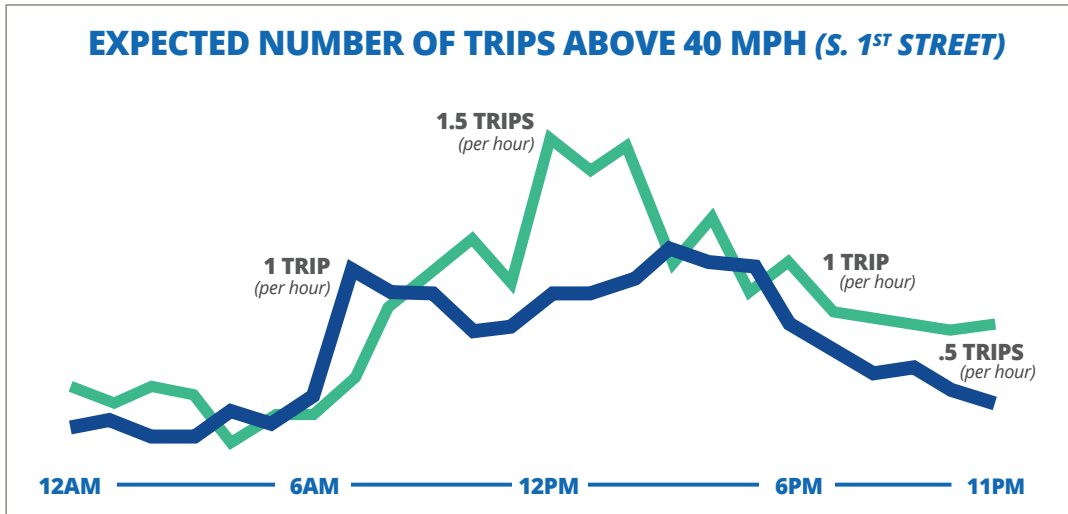**AREA DESCRIPTION:** One-mile stretch of roadway within the city of Sunnyside.

AREA SELECTION: This area was identified as an area of concern by the community.

STUDY OBJECTIVE: Determine the driving behaviors occurring on this roadway, and where there is potential for safety improvements.

The study team found that 8 out of 10 cars on this stretch of road were exceeding the 25 mph posted speed limit. On average, 20 cars each hour were speeding by more than 5 mph in this highly residential area. While most drivers are driving around 32 mph, a significant number of drivers were driving more than 40 mph. Over a six-month period, this risky speeding behavior occurred more than 3,000 times.

Although not as severe a risk hotspot as other areas of Yakima County, there were several areas of concern along this stretch of roadway, especially considering it is a residential area and near a major park enjoyed by pedestrians. Driver speeding behavior leads to elevated hard braking at two intersections: Lincoln Avenue and Hill Road, posing an elevated risk to walkers and bicyclists. Michelin data shows that about 40 percent of drivers are traveling more than 30 mph on this corridor with a posted speed limit of 25 mph.

EXPECTED NUMBER OF TRIPS ABOVE 40 MPH *(S. 1ST STREET)*

1.5 TRIPS
(per hour)

1 TRIP
(per hour)

1 TRIP
(per hour)

.5 TRIPS
(per hour)

12AM — 6AM — 12PM — 6PM — 11PM

The graph shows the number of speeding trips in excess of 40 mph taken by drivers on 1st Street, showing the most occurrences in the early afternoons on weekends.

!

DATA DISCOVERY:

Over a span of 6 months, over 3,000 trips were detected where drivers were exceeding 40 mph in this heavily residential area with a posted speed limit of 25 mph.

Overall Takeaways for Yakima County Focus Area 3:

1 Sunnyside's South 1st Street has two areas that are particularly vulnerable to crashes: The intersection with Lincoln Avenue and the intersection with Hill Road.

2 80% of drivers exceed the posted speed limit, with over 40% of drivers exceeding it by more than 20% (speeding of 5+ mph)

3 Both intersections have a history of crashes, involving both Vulnerable Road Users (VRU) and Vehicle-to-Vehicle (V2V) collisions.

4 Potential Safety Factors:

- Possible insufficient lighting and signage
- Heavy residential area
- High vehicle velocity
- Numerous intersections
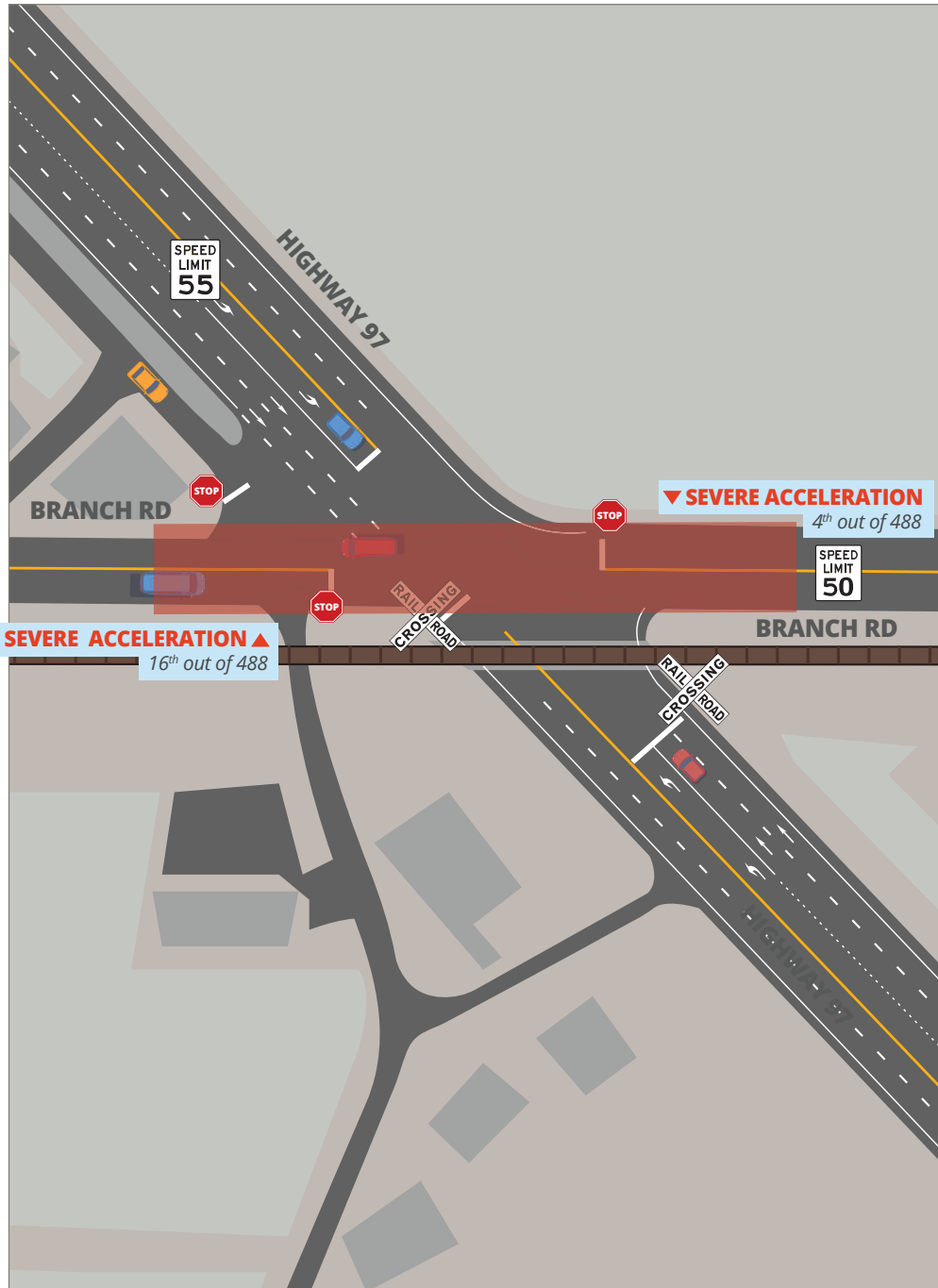
FOCUS AREA 4

Speeding, Hard Braking, and Harsh Acceleration on Highway 97 and Branch Road

AREA DESCRIPTION: This intersection includes a railroad crossing and posted speed limits of 50 mph and higher.

AREA SELECTION: This area was identified through the project team's network screening as an area that should be studied.

STUDY OBJECTIVE: Determine if there is an elevated risk of collisions and severe braking and acceleration behavior at this intersection.

There is a posted speed limit of 55 mph on state highway 97 and 50 mph on Branch Road. These are higher speed roadways already, and the analysis showed that most drivers were going about 10 mph over the posted speed limit, with only a slight decrease as drivers approach the intersection.

Most drivers are not slowing down when traveling over the railroad crossing. Fifteen percent of drivers went 10 mph or more above the posted speed limit in this study area.

The study also shows that there is frequent severe braking as drivers approach US 97 on Branch Road, and even more severe acceleration immediately after crossing the railroad track and as drivers try to contend with oncoming traffic across five lanes.
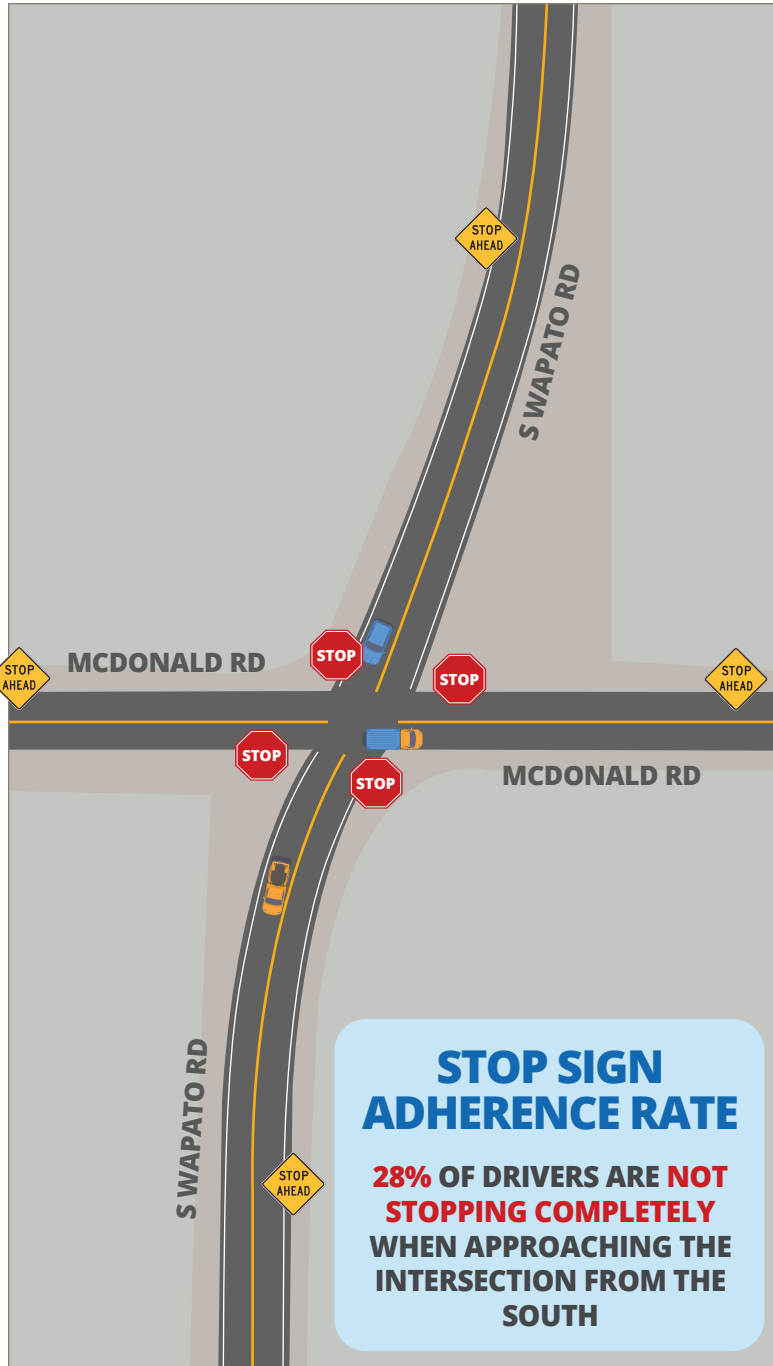
Overall Takeaways for Yakima County Focus Area 4:

1 Drivers tend to go 10+ mph over the posted speed limit on US-97 in this area.

2 Frequent severe braking and acceleration occur around the railroad crossing.

!

DATA DISCOVERY:

Severe driving behavior patterns often indicate the presence of multiple risk factors - in this case, high speeds on US-97 combined with the large distance drivers need to cover when turning across 3 or more lanes to get onto US-97.

STOP AHEAD

S WAPATO RD

MCDONALD RD

STOP

STOP AHEAD

STOP

STOP AHEAD

STOP

MCDONALD RD

STOP

STOP AHEAD

S WAPATO RD

STOP AHEAD

STOP SIGN ADHERENCE RATE

28% OF DRIVERS ARE **NOT STOPPING COMPLETELY** WHEN APPROACHING THE INTERSECTION FROM THE SOUTH

FOCUS AREA 5

Speeding, Hard Braking, and Stop Sign Adherence at McDonald Road and South Wapato Road

AREA DESCRIPTION: This is a four-way stop intersection in a rural section of the Yakama Reservation near a university, to the west of US-97.

AREA SELECTION: This area was identified through the project team's network screening as an area that should be studied.

STUDY OBJECTIVE: In the last several years, this intersection was converted from a two-way stop to a four-way stop. The study team wanted to understand the current driving behavior in the area.

Some of the most high-risk driving behavior in our analysis of Yakima County was found at this intersection with regards to speeding and hard braking. Drivers are approaching this intersection traveling around 60 mph when approaching the intersection from the north and south. There is a pattern of hard braking beginning at a "Stop Ahead" warning sign.

When approaching from the north, it is a relatively short distance from the point where braking starts and the intersection. Drivers approaching the intersection from east to west are traveling around 60-65 mph but start decelerating sooner.

The Michelin data also showed that drivers are less likely to come to a complete stop at this intersection from approaching from the south (as low as 72% stop adherence versus an average of 83%).

Overall Takeaways for Yakima County Focus Area 5:

1 Drivers coming from both north and south, but especially south, exhibit extremely severe braking behavior before and at the stop signs.

2 Drivers coming from the north also exhibit dangerous speed and braking patterns, as deceleration happens later from this direction than from other directions (900 feet from the intersection compared to 1100 feet for other directions).

3 Drivers coming from the south are more likely to fail to stop at the stop sign than drivers at other intersections in the area are.

4 From all directions, stop sign adherence at this intersection is lower than at other intersections in the area.

!

DATA DISCOVERY:

Some of the highest risk speeding and hard braking behaviors in the Yakima analysis occur at this intersection.

FOCUS AREA 6

Crash Risk on Rural versus Urban Roads:
Weekday versus Weekend, and Day versus Night Comparison

STUDY OBJECTIVE: This study was requested by the WTSC to determine the differences in driving behavior between weekends and weekdays, and during the day versus at night.

In Yakima County, nighttime driving poses a significantly higher crash risk compared to daytime, particularly between midnight and 6 AM, where the risk can be up to 25 times greater.

CRITICAL FINDING: Roads that 85% of drivers go 55 mph or slower on, experience the highest number of crashes and account for nearly 27% of total collisions.

Rural roads with this specific speed metric are particularly risky during nighttime hours, highlighting the compounded dangers of driving in these conditions.

TYPE	CONTEXT	RISK DIFFERENCE (Peak to Minimum)
Urban		5.9x
Rural	Week	**9.9x**
Highway		8.9x
Urban		16.2x
Rural	Weekend	**18.3x**
Highway		25.1x

Overall Takeaways for Yakima County Focus Area 6:

1 Drivers at night face a higher crash risk per trip than drivers during the day.

2 Roads with a V85 of about 55 mph experience nearly 27% of total collisions in Yakima County.

OVERALL STUDY CONCLUSION AND KEY TAKEAWAYS

No level of traffic fatalities is acceptable for our Washington communities and families. That is why WTSC embarked on this initiative to bring a new level of innovation to our traffic safety analysis to ensure we are getting the full picture of community traffic safety concerns and risk hotspots and to drive positive safety outcomes, with South King and Yakima counties as our pilot.

Coupled with comprehensive crash information, these new insights tell us where to proactively focus our limited resources and where to prioritize changes to infrastructure, enforcement, or community education. WTSC looks forward to working with communities across King and Yakima counties to make our roadways safer and drive progress on the Target Zero plan.

By combining traditional crash data with driving behavior insights, we can gain a clearer picture of where to focus our efforts and resources to make the biggest impact on safety, particularly in South King and Yakima counties, where traffic safety has been a major concern.

Overall takeaways:

FOCUS ON RISKY DRIVING BEHAVIORS
The data from these studies show that certain driving behaviors, like speeding, hard braking, and harsh acceleration, are significantly contributing to crash risks in both South King and Yakima counties. These behaviors are key focus areas because they directly impact the likelihood of crashes. Identifying where these behaviors are happening allows us to target interventions more effectively.

SOCIOECONOMIC FACTORS AND RISK
Areas with lower income or limited access to safer road infrastructure tend to experience higher levels of exposure to risky driving behavior. In particular, South King and Yakima counties have neighborhoods with higher speeding or unsafe driving around pedestrians.

INCREASED RISK AT NIGHT

The study found that driving risks are elevated at night, particularly on rural roads in Yakima County. The increased risk during nighttime driving underscores the importance of focusing on driving behavior patterns at different times of the day. The findings suggest that additional attention to these hours will be essential for improving overall road safety.

ENGAGING WITH COMMUNITIES

Listening to the concerns of local communities was a vital part of this study. We found that communities members are involved in identifying risk areas and understanding driving behavior, it leads to more effective safety solutions. Their input has helped shaped our understanding of where these behaviors are most dangerous and how to reduce the risks they present.

TARGET ZERO GOAL

This study plays an important role in supporting Washington's Target Zero goal, aiming to eliminate traffic fatalities by 2030. By focusing on high-risk driving behaviors and using data to guide decisions, we can work more effectively to prevent crashes and improve safety for everyone on the road.

This report highlights the importance of understanding and addressing risky driving behaviors. Coupled with comprehensive crash information, these new insights tell us where to proactively focus our limited resources and where to prioritize changes to infrastructure, enforcement, or community education. WTSC looks forward to working with communities across King and Yakima counties to make our roadways safer and drive progress on the Target Zero plan.