



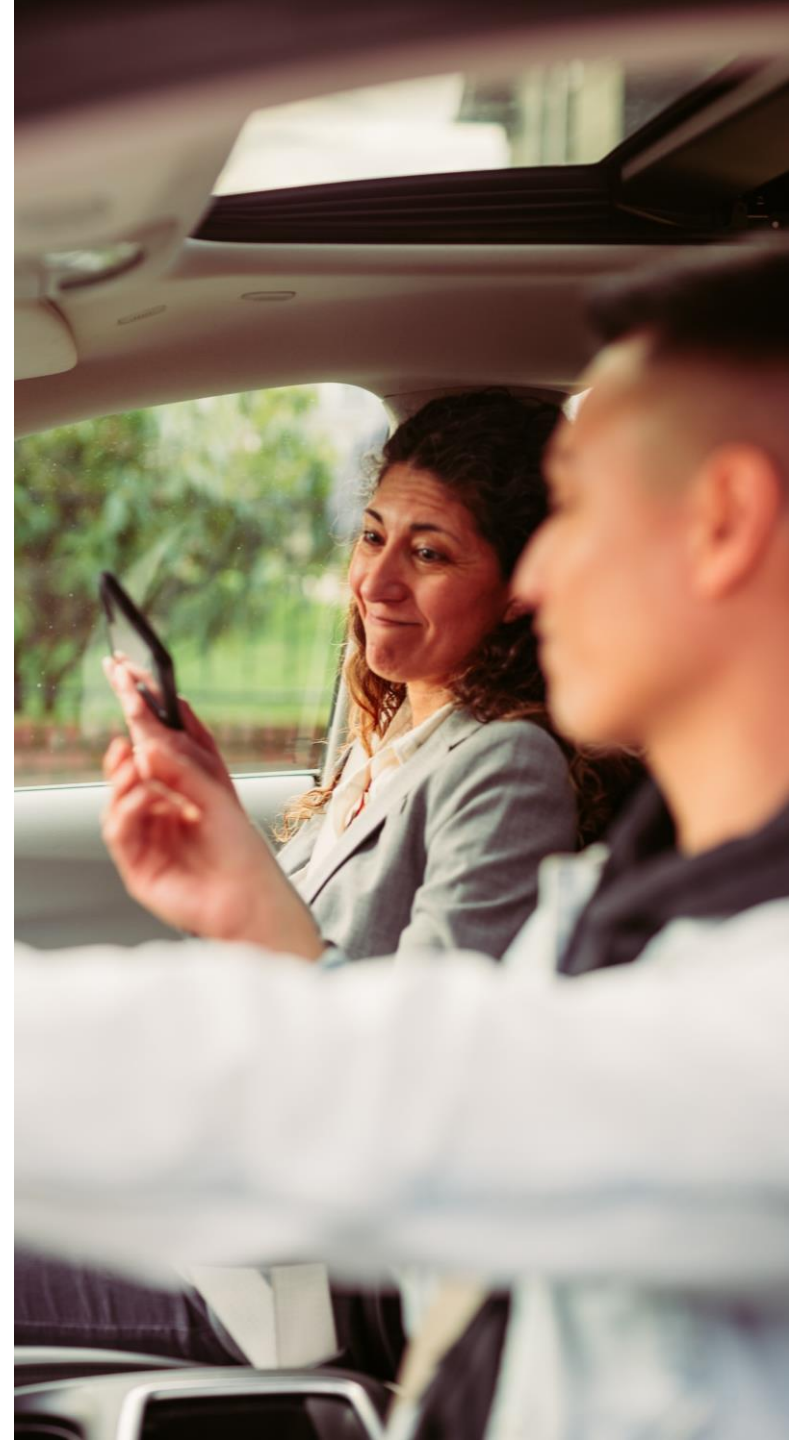
Traffic Safety Insights from Telematics Data

Staci Hoff, Ph.D., Research Director
Washington Traffic Safety Commission
Quarterly Meeting of the WTSC
January 16, 2025

WHAT IS TELEMATICS DATA?

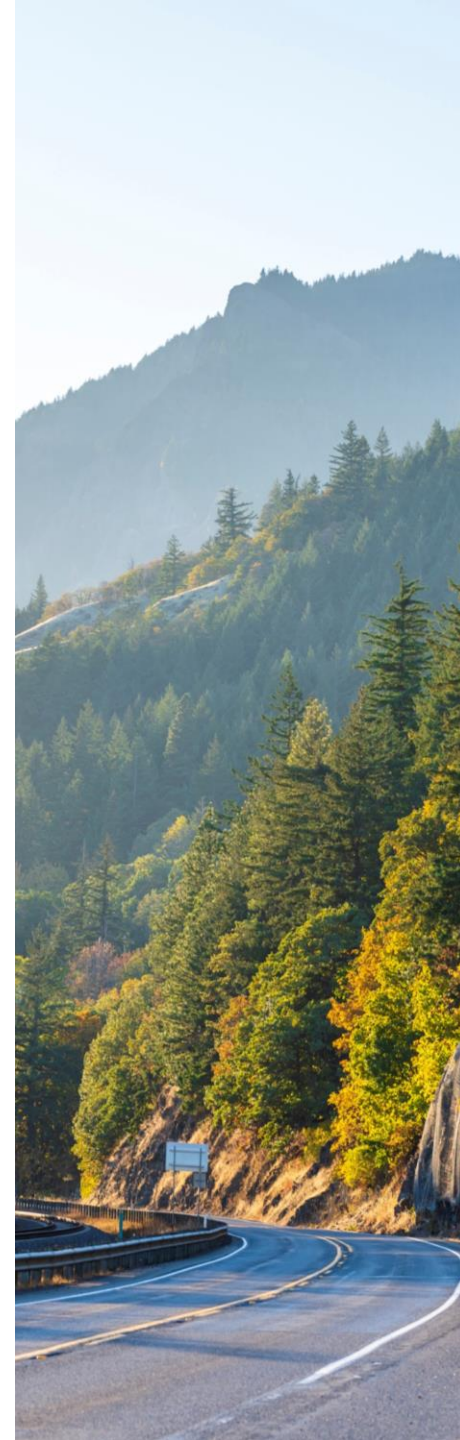
Telematics data is information collected about a vehicle or fleet using telematics technology, which combines GPS, sensors, and software to monitor and analyze vehicle and driver performance.

(9) \$300,000 of the highway safety account—state appropriation is provided solely for the commission to purchase telematics data from a qualified vendor that provides anonymized information on vehicle speeds and driver behaviors, such as hard braking, on a statewide basis and in selected geographical areas based upon demographic characteristics and crash history.



WHAT IS COLLECTED?

- Specific measures may vary among different telematics providers
- Travel Speeds and Speeding Events
 - CMT speeding events are exceeding the posted speed limit by 9.3 mph or more for >5 seconds, or 12.4 mph or more when the speed limit is >55mph
- Cell phone-related distraction: phone motion and phone calls
- Hard-braking
- Hard-acceleration
- Machine-learning/AI algorithms to derive segment-level driver and vulnerable road user risk ratings

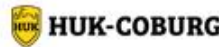


CAMBRIDGE MOBILE TELEMATICS



- Used by 21 of the top 25 US Auto Insurers
- Users must opt-in to a CMT program
- Data is not sold to third-parties and is anonymized

Select Customers



Washington State Driving Behavior Analysis



- CMT has published multiple U.S. reports describing the magnitude of risky driving behaviors
- WTSC conducted a sole source contract to procure a Washington report for statewide and county-level measures of risky driving
- Report #1 (released in 2024), June 2022 and June 2023 data
- Report #2 (pending release in 2025), adding June 2024 data

Link to report at <https://wtsc.wa.gov/data-collaborations/>

CMT WASHINGTON DRIVER COVERAGE

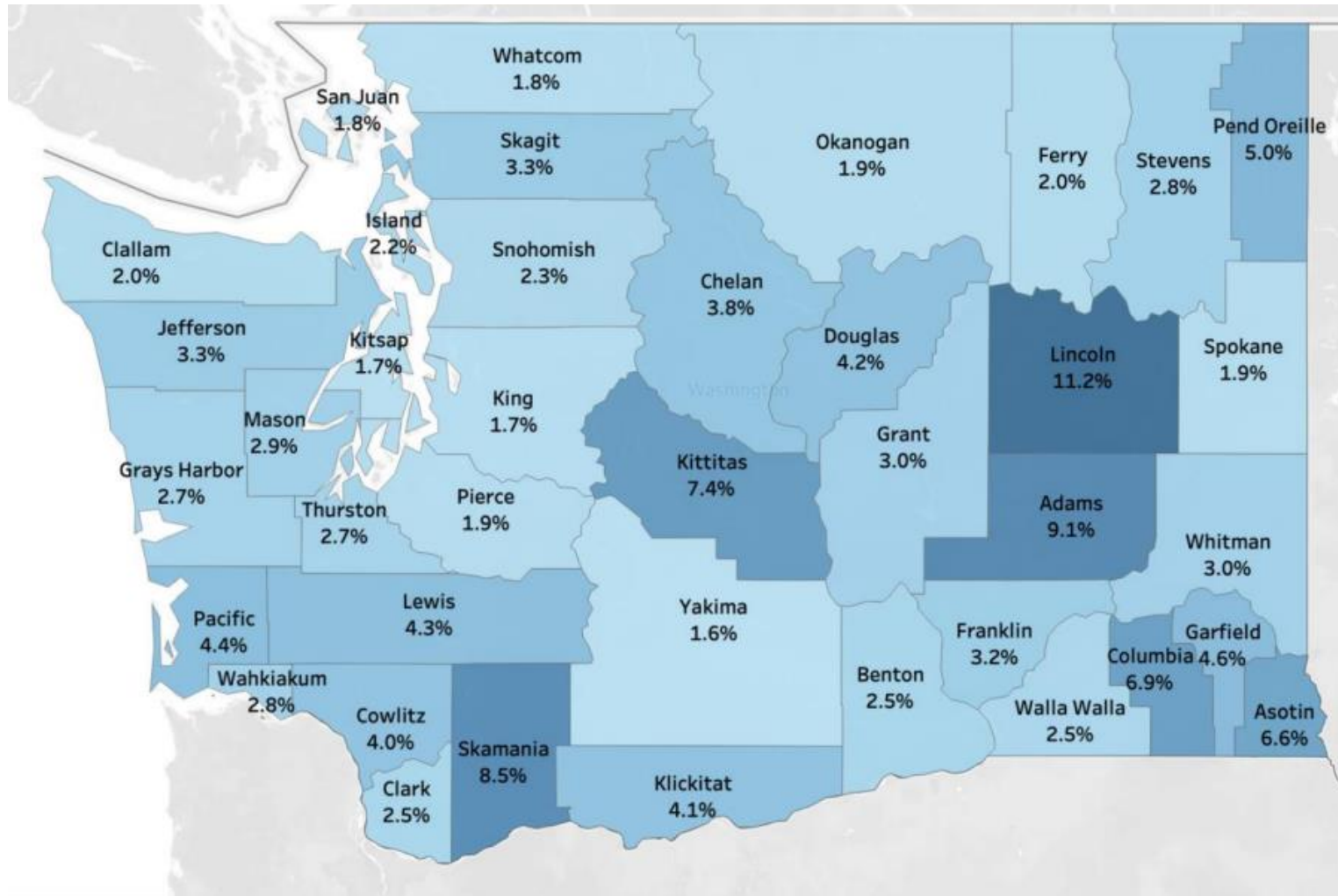


Figure 3. Unique drivers as a percent of county population in each county in for the June 2023 corpus. Rural counties are well represented when normalized this way.

CMT WASHINGTON DRIVER COVERAGE

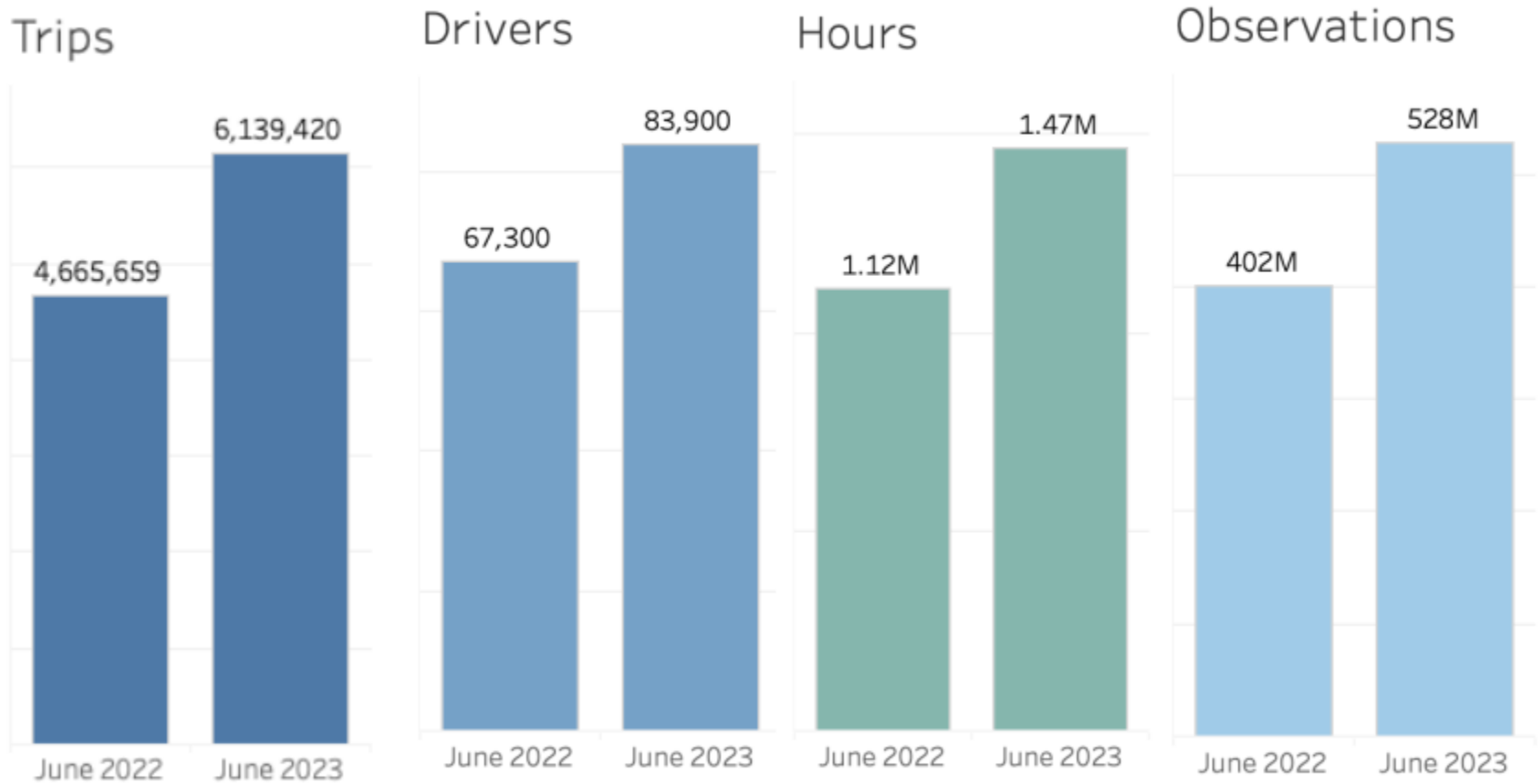
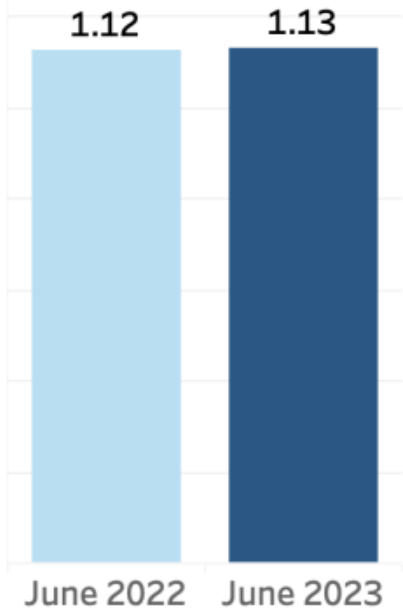


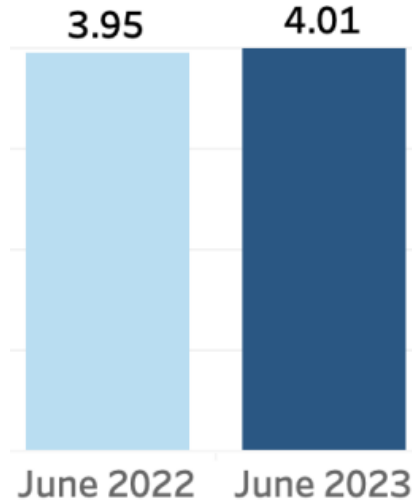
Figure 4. Trips, drivers, total trip hours, and effective roadside observations for Washington State for the two periods of study.

DISTRACTED DRIVING - STATEWIDE

Distracted driving - Phone Motion

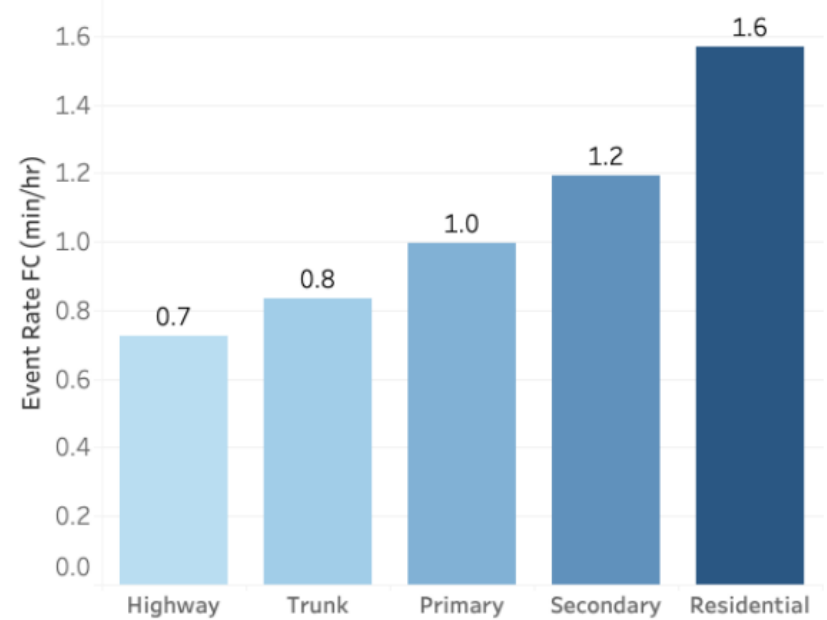


Distracted driving - Phone Calls



Number of minutes per hour of driving

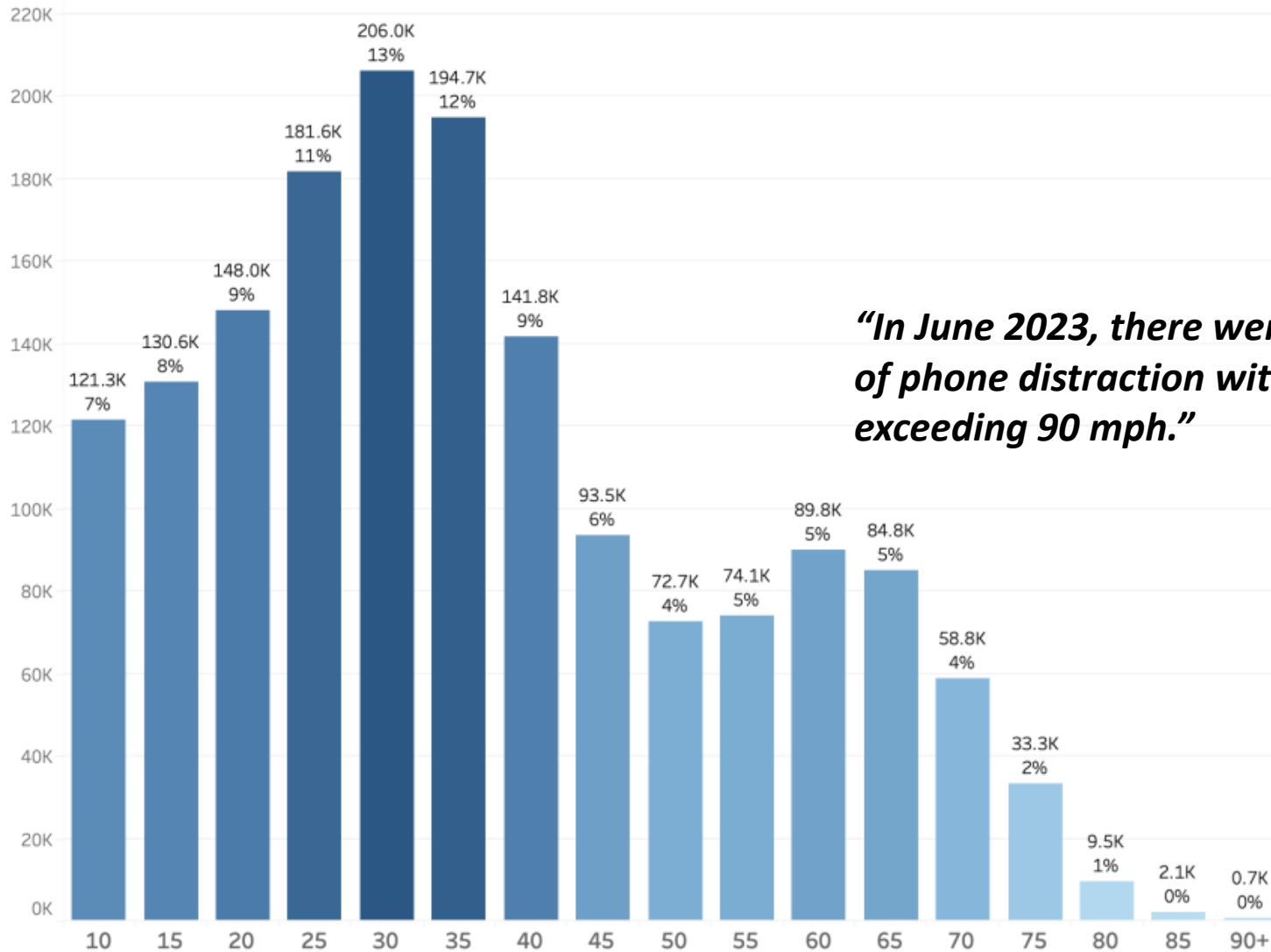
Distracted driving - Phone Motion



Number of minutes per hour of driving

“About 1 in 4 (25%) of trips had phone distraction. This is much higher than the 9% rate measured by the Washington roadside observation survey”

DISTRACTED DRIVING – BY SPEED BAND



“In June 2023, there were 670 minutes of phone distraction with the driver exceeding 90 mph.”

Figure 21. The minutes of phone motion distraction seen in Washington State in June 2023, broken out by the speed band (mph) at the time of the distraction. The percentages show minutes of distraction at this speed divided by the total distraction minutes.

SPEEDING EVENTS

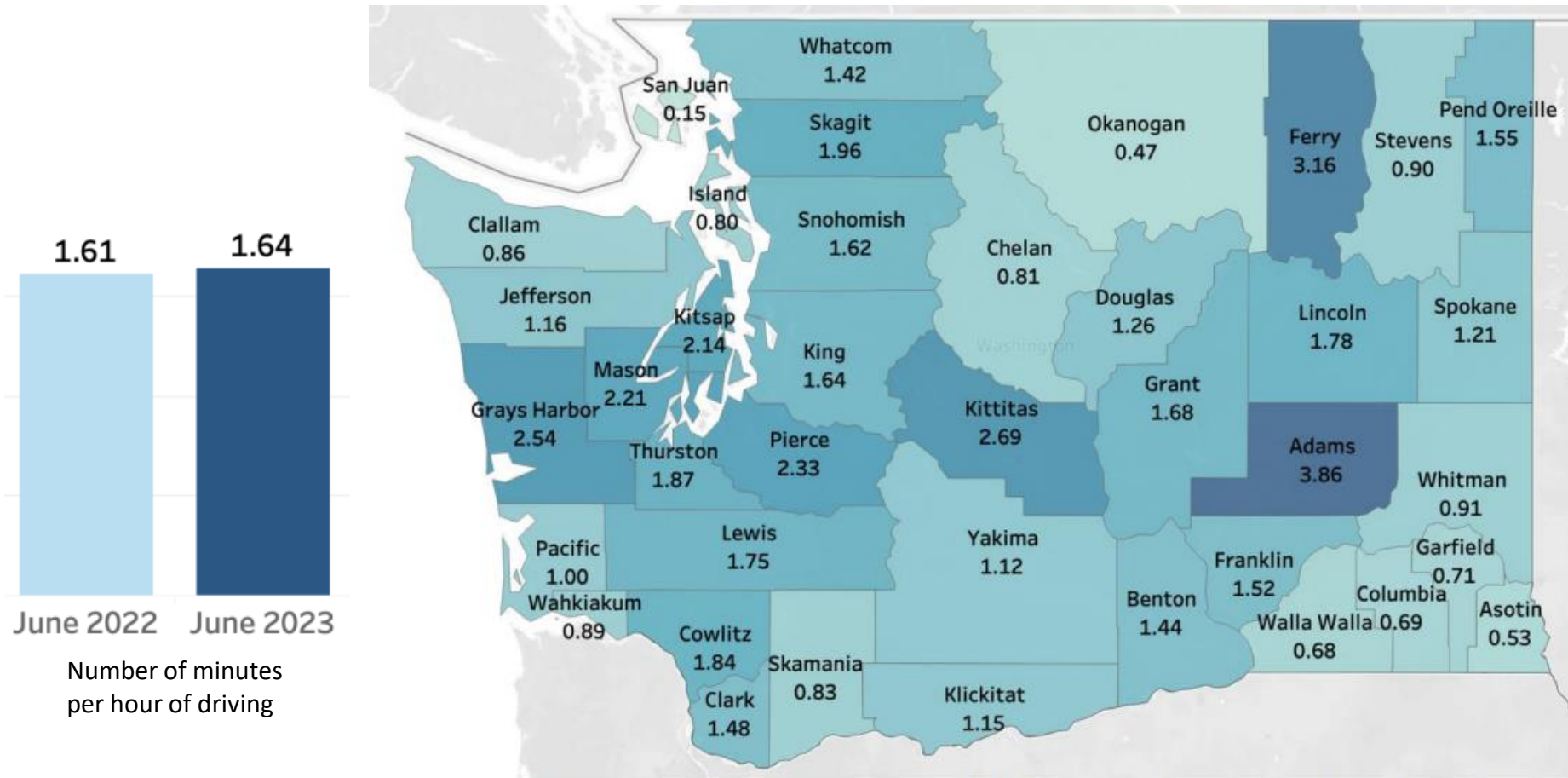


Figure 17. Speeding rates by county for June 2023 (minutes of speeding per hour of driving)

SPEEDING EVENTS

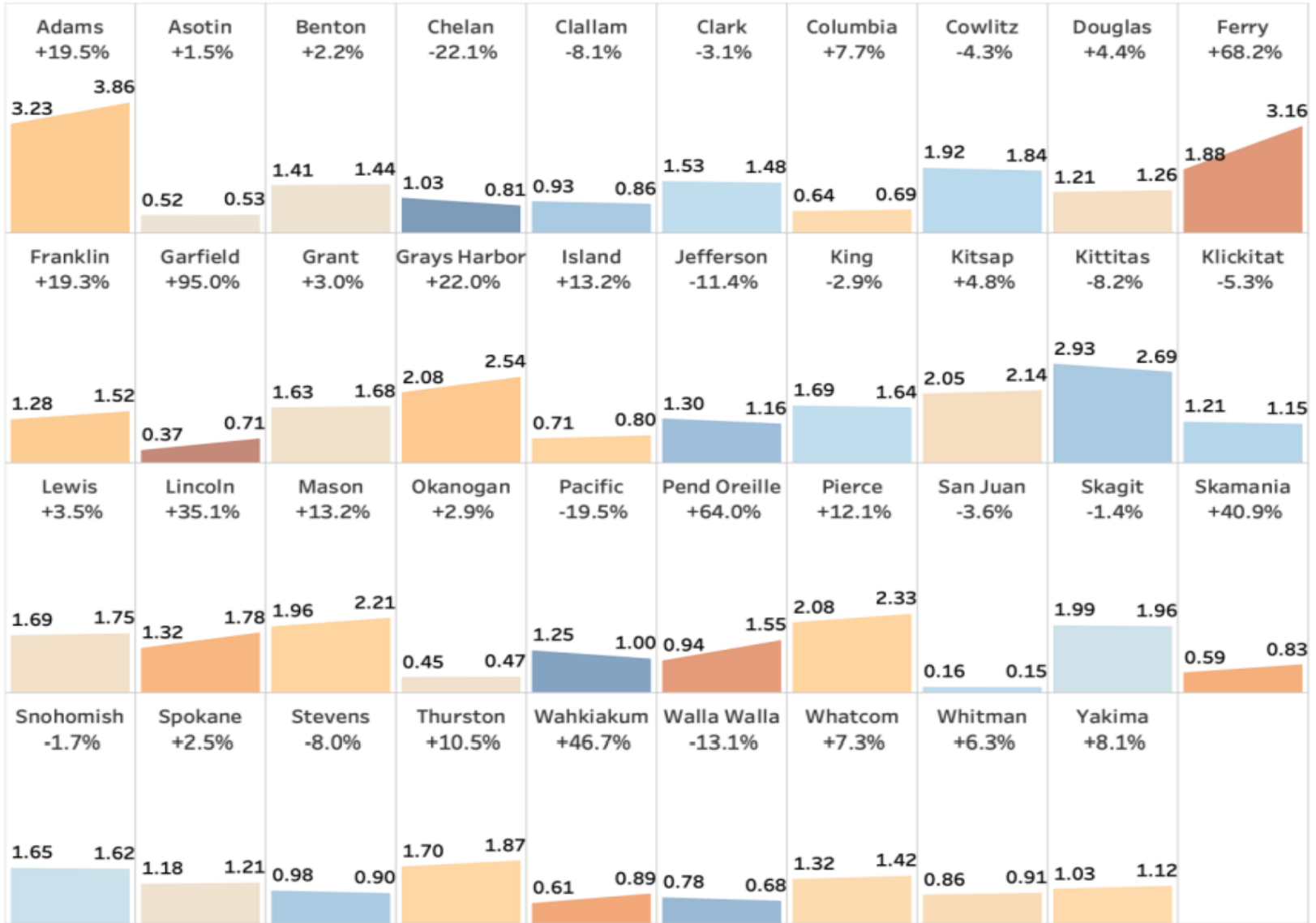
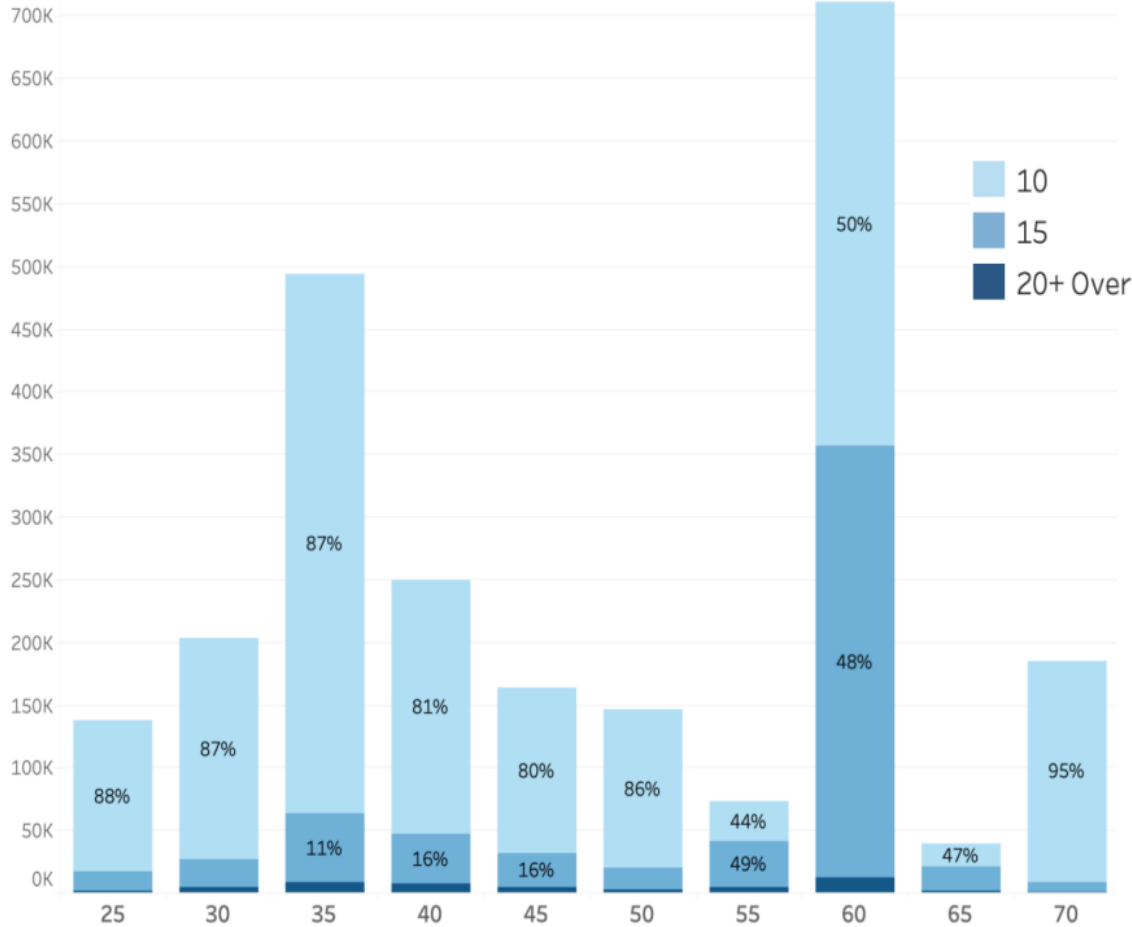


Figure 18. Change in speeding per hour of driving from June 2022 to June 2023 by county. The charts are colored by the percent change from 2022 to 2023. **Statewide speeding showed a slight increase from 1.61 minutes per hour to 1.64 minutes per hour.**



SPEEDING EVENTS BY POSTED SPEED



Speed Limit	10 to 15 mph over	15 to 20 mph over	20+ Over
25	88%	11%	2%
30	87%	11%	2%
35	87%	11%	2%
40	81%	16%	3%
45	80%	16%	3%
50	86%	12%	2%
55	44%	49%	7%
60	50%	48%	2%
65	47%	47%	5%
70	95%	5%	<0.5%

Figure 28. The count of speeding events by speed limit, and the amount that the limit was exceeded by (darker colors indicate greater amounts above the limit) for June 2023. The percent in each excess speed band are also shown in the table below.

“On highways with 55-65 mph speed limits, about half exceed that limit by more than 15 mph.”

HARD BRAKING BY SPEED BAND

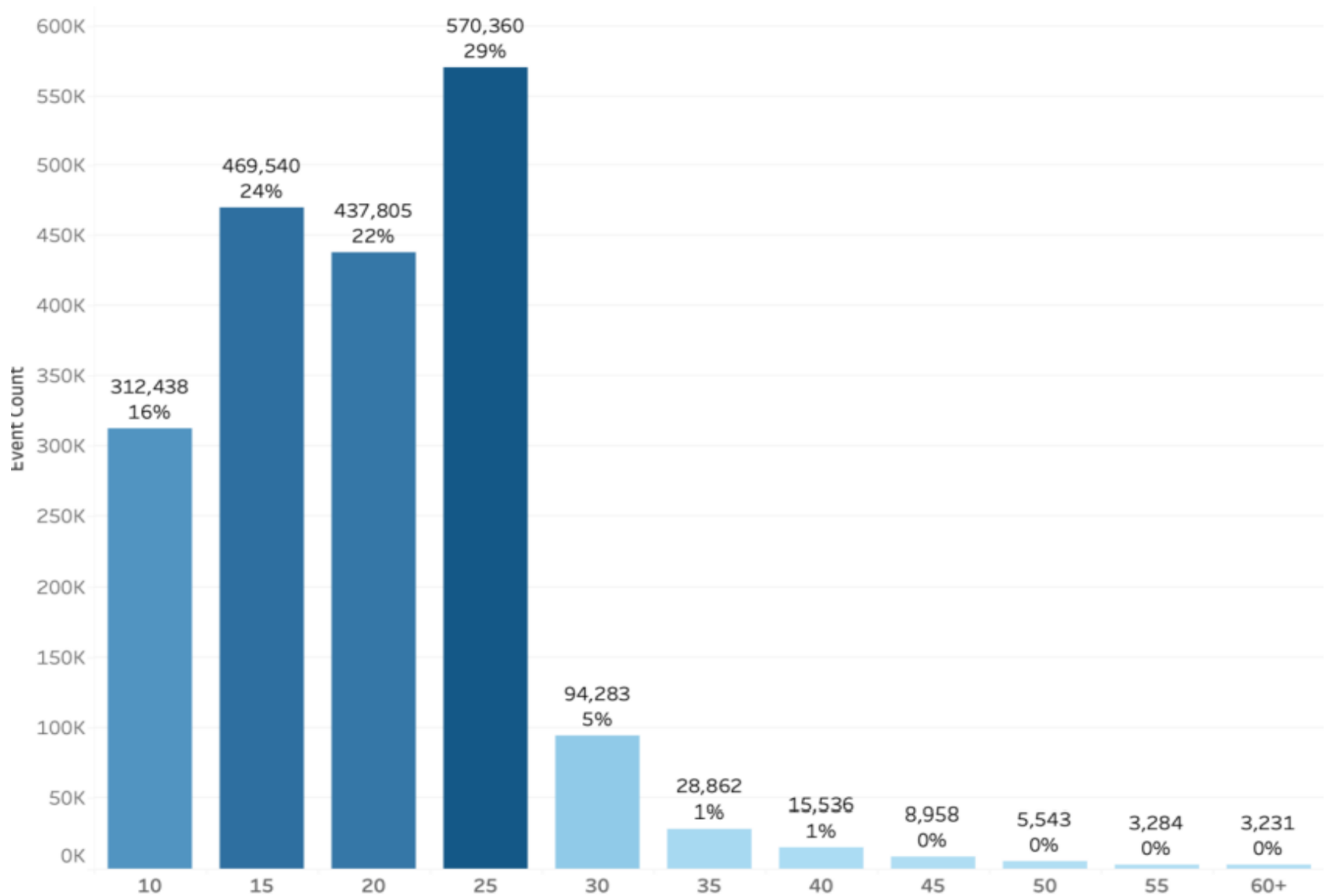


Figure 26. The count of hard brake events seen in Washington State in June 2023, broken out by the speed band (mph) at the start of braking.

Questions

Pause for questions/comments regarding the CMT statewide analysis...

Next up... Michelin Mobility Intelligence

MICHELIN MOBILITY INTELLIGENCE



MICHELIN
MOBILITY INTELLIGENCE

MOBILE PHONE SOURCE OF DATA

1.2 Million mobile
devices State of
Washington

DATA COLLECTED FROM SDK EMBEDDED IN CONSUMER APPS



- Partnership with the Governor's Highway Safety Association (GHSA) to offer \$100,000 in data service credits
- Washington one of three states awarded in 2024 (we provided a \$100,000 match in order to include two high-risk communities in the project)

MICHELIN MOBILITY INTELLIGENCE

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.

Summaries of South King County Focus Areas

- Focus Area 1: Corridor from 140th Ave SE To 132nd Ave SE*
- Focus Area 2: Kent-Kangley Rd and 116th Ave Intersection*
- Focus Area 3: Sunset Blvd and NE 3rd Street Intersection*
- Focus Area 4: SE Summit Landsburg and 253rd St Intersection*

Summaries of Yakima County Focus Areas

- Focus Area 1: City of Yakima Intersection Crash Analysis Combined with MMI Analysis.....*
- Focus Area 2: US-24 and Bell Road Intersection on Moxee Highway*
- Focus Area 3: S. 1st St Corridor in Sunnyside.....*
- Focus Area 4: Highway 97 and Branch Rd.....*
- Focus Area 5: McDonald Rd and South Wapato Rd*
- Focus Area 6: Crash Risk on Rural vs. Urban Roads.....*

Project Deliverables:

- [Presentation](#) of final results
- Interactive [Kepler Maps](#) for South King and Yakima County road networks
- [Community report](#) with graphics package

MMI WASHINGTON COVERAGE

YAKIMA

9.7
THOUSAND

Miles of Road

.51
BILLION

GPS Points Collected

2
MILLION

Total Driving Hours

1.2
MILLION

Braking Events

242
THOUSAND

Acceleration Events

SOUTH KING

11.4
THOUSAND

Miles of Road

1.4
BILLION

GPS Points Collected

7
MILLION

Total Driving Hours

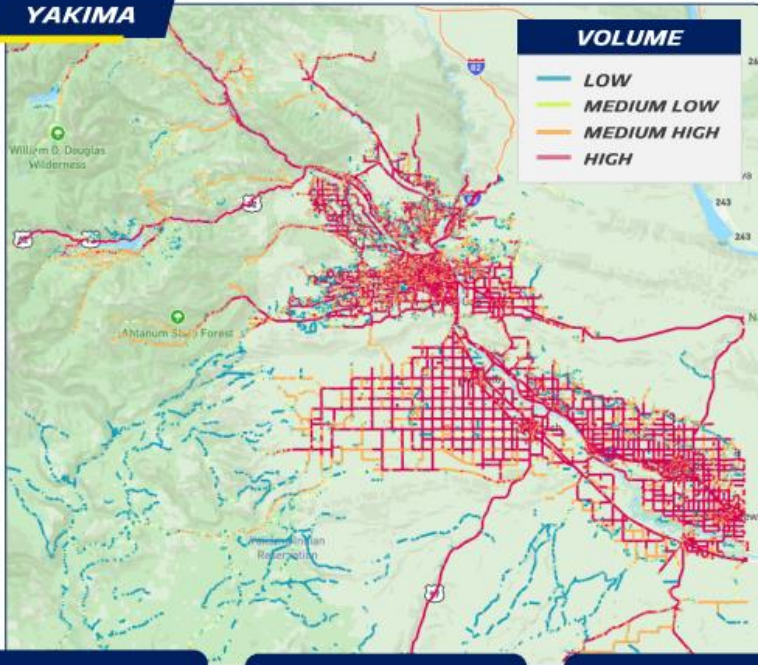
5
MILLION

Braking Events

1
MILLION

Acceleration Events

YAKIMA

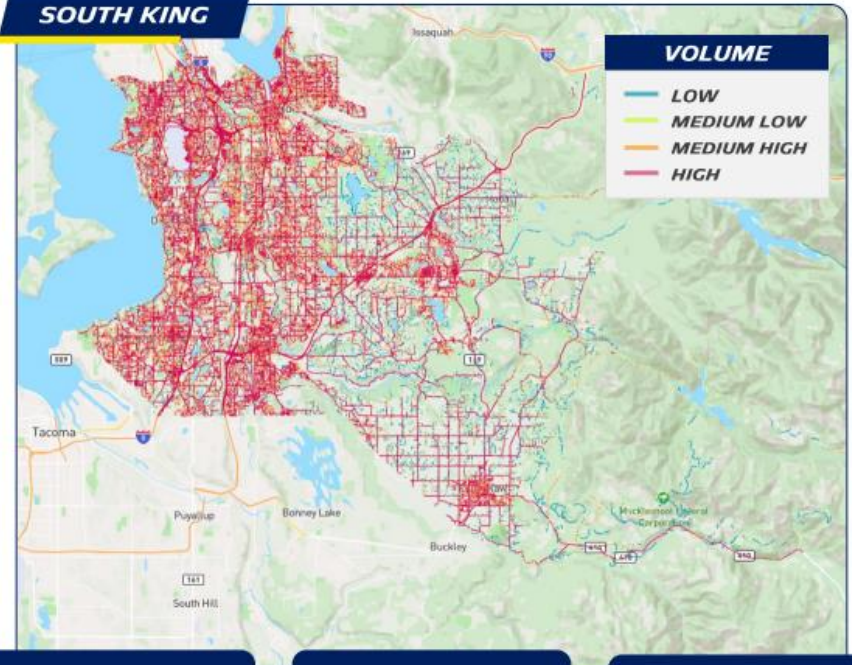


TRIP POINTS
85 Million Trips per Month

ATYPICAL EVENTS
234 Million per Month

2020 POPULATION
257,000 Residents

SOUTH KING



TRIP POINTS
234 Million Trips per Month

ATYPICAL EVENTS
1 Million per Month

2023 POPULATION
664,000 Residents

SOUTH KING COUNTY – THE 140TH/132ND CORRIDOR

FOCUS AREA 1

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



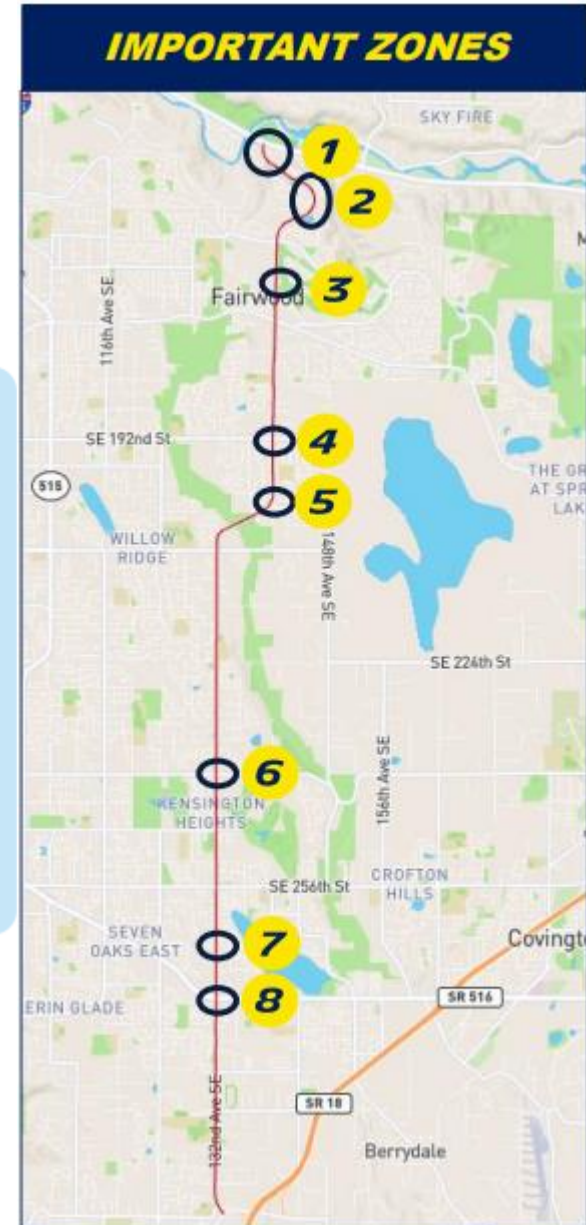
AREA DESCRIPTION: An 11-mile corridor along 132nd Avenue, where the posted speed limit for the corridor is 40 mph headed north and 35 mph headed south.



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.



RISKIEST ROAD SEGMENTS

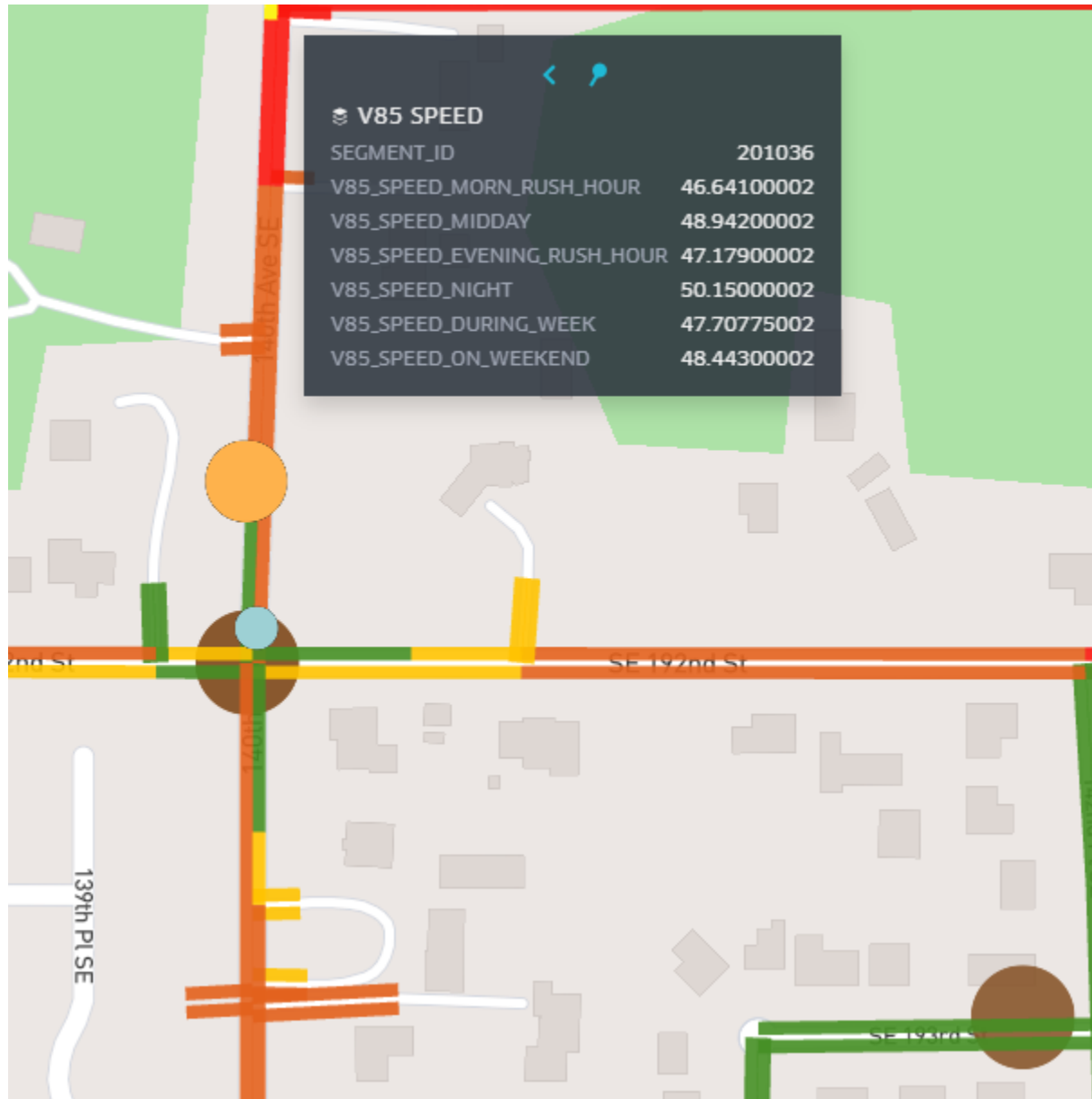
Corridor from 140th Avenue SE to 132nd Avenue SE (South King County)

Location	Braking Behavior Severity (Rank)	Acceleration Behavior Severity	Speeding (8-10 MPH)	VRU Crash Risk	Crashes (Since 2020)	Total Risk Score:
BEFORE SE 158TH ST.	5 yellow triangles	5 yellow triangles	5 red triangles	5 red triangles	5 red triangles	19
FAIRWOOD GOLF	5 red triangles	5 red triangles	5 red triangles	5 white triangles	1 green triangle, 4 white triangles	15
SE 192ND ST.	4 red triangles, 1 white triangle	5 red triangles	5 red triangles	5 white triangles	2 yellow triangles, 3 white triangles	15
SE 240TH ST.	5 yellow triangles	5 red triangles	4 yellow triangles, 1 white triangle	5 white triangles	5 red triangles	15
SE 272ND ST.	1 green triangle, 4 white triangles	1 green triangle, 4 white triangles	4 yellow triangles, 1 white triangle	5 red triangles	2 yellow triangles, 3 white triangles	12
NORTHERN CURVE	2 yellow triangles, 3 white triangles	5 red triangles	4 yellow triangles, 1 white triangle	5 white triangles	2 yellow triangles, 3 white triangles	11
SE 200TH ST.	5 red triangles	5 white triangles	1 green triangle, 4 white triangles	5 white triangles	1 green triangle, 4 white triangles	7
SE 266TH ST.	4 yellow triangles, 1 white triangle	5 white triangles	4 yellow triangles, 1 white triangle	5 white triangles	1 green triangle, 4 white triangles	7

EVENTS SPEED CRASH RISK

KEPLER MAP LAYERS

- Location of fatal crash in Auburn that killed 4 people, 3 were children, by 18 yo driver traveling 112 mph
- Hard-braking hotspot (orange)
- Acceleration hotspot (blue)
- History of serious crash (brown)
- V85 speeds 5-10 mph higher than posted speeds (meaning 15% of drivers traveling even faster!)



YAKIMA COUNTY INTERSECTION ANALYSIS

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.

Intersection Name	Crashes
16 TH AVE & NOB HILL BLVD	46
40 TH AVE & SUMMITVIEW AVE	26
1 ST ST & NOB HILL BLVD	26
FAIR AVE & NOB HILL BLVD	24
16 TH AVE & LINCOLN AVE	24
3 RD AVE & NOB HILL BLVD	23
5 TH AVE & YAKIMA AVE	23
1 ST ST & MEAD AVE	23
1 ST ST & LINCOLN AVE	20
16 TH AVE & FRUITVALE BLVD	20
40 TH AVE & FRUITVALE BLVD	20
1 ST ST & D ST	19
3 RD AVE & LINCOLN AVE	19
3 RD AVE & YAKIMA AVE	18
1 ST ST & YAKIMA AVE	18
32 ND AVE & NOB HILL BLVD	17
6 TH ST & NOB HILL BLVD	17
CUSTER AVE & LINCOLN AVE	16
16 TH AVE & TIETON DR	16
1 ST ST & WASHINGTON AVE	15
18 TH ST & NOB HILL BLVD	15
16 TH AVE & SUMMITVIEW AVE	15

YAKIMA COUNTY INTERSECTION ANALYSIS

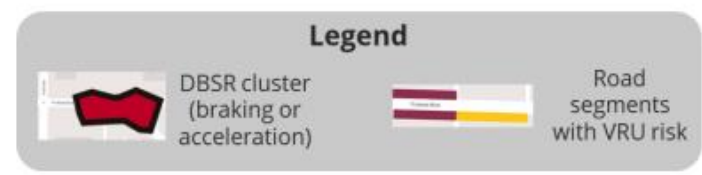
Behavior-based risk ranking

(MMI ranking comes only from evaluation of driving behavior severity)

Intersection Name	Crashes	Crashes with Injury	Proportion of Crashes with Injury	Risk Group
16 TH AVE & FRUITVALE BLVD	20	4	0.20	5
6 TH ST & NOB HILL BLVD	17	3	0.18	5
3 RD AVE & NOB HILL BLVD	23	3	0.13	5
FAIR AVE & NOB HILL BLVD	24	3	0.13	5
16 TH AVE & LINCOLN AVE	24	3	0.13	5
1 ST ST & LINCOLN AVE	20	2	0.10	5
32 ND AVE & NOB HILL BLVD	17	1	0.06	5
CUSTER AVE & LINCOLN AVE	16	4	0.25	4
3 RD AVE & YAKIMA AVE	18	4	0.22	4
5 TH AVE & YAKIMA AVE	23	3	0.13	4
16 TH AVE & NOB HILL BLVD	46	5	0.11	4
1 ST ST & WASHINGTON AVE	15	1	0.07	4
1 ST ST & D ST	19	1	0.05	4
40 TH AVE & SUMMITVIEW AVE	26	1	0.04	4
18 TH ST & NOB HILL BLVD	15	2	0.13	3
1 ST ST & YAKIMA AVE	18	2	0.11	3
3 RD AVE & LINCOLN AVE	19	2	0.11	3
40 TH AVE & FRUITVALE BLVD	20	2	0.10	3
16 TH AVE & TIETON DR	16	1	0.06	3
16 TH AVE & SUMMITVIEW AVE	15	2	0.13	2
1 ST ST & NOB HILL BLVD	26	3	0.12	2
1 ST ST & MEAD AVE	23	1	0.04	1

Risk Level Classifications

- 5: 3+ AND very severe driving behavior hotspots present
- 4: Either 2+ moderate OR 1 very severe hotspot present
- 3: Either 2 moderate hotspots OR 1 severe hotspot present
- 2: 1 moderate hotspot present
- 1: 0 hotspots present



OVERALL STUDY CONCLUSION AND KEY 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.



UPDATE ON TELEMATICS DATA PROCUREMENT EFFORTS

- We announced the opportunity to be included in a convenience contract
 - WTSC, WSDOT, WSP, CRAB, HCA, DOH, DOL
 - Other potential customers WSTC, Department of Commerce
- DES has determined that the demand is high enough for a statewide contract!
 - Statewide contracts leverage the state's collective buying power to help you save money, reduce risk, and streamline purchasing. Agencies may buy products and services directly.

Questions

Staci Hoff, Ph.D., Research Director

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<https://wtsc.wa.gov/data-collaborations/>

<https://wtsc.wa.gov/dashboards/>

<https://wtsc.wa.gov/traffic-safety-reports/>