DYNAMIC DRIVER FEEDBACK SIGNS: PILOT DATA SUMMARY – KING COUNTY WA

King County Target Zero Program

Public Health – Seattle & King County

December 12, 2024

PROJECT OVERVIEW

Smart Signs dynamic feedback signs

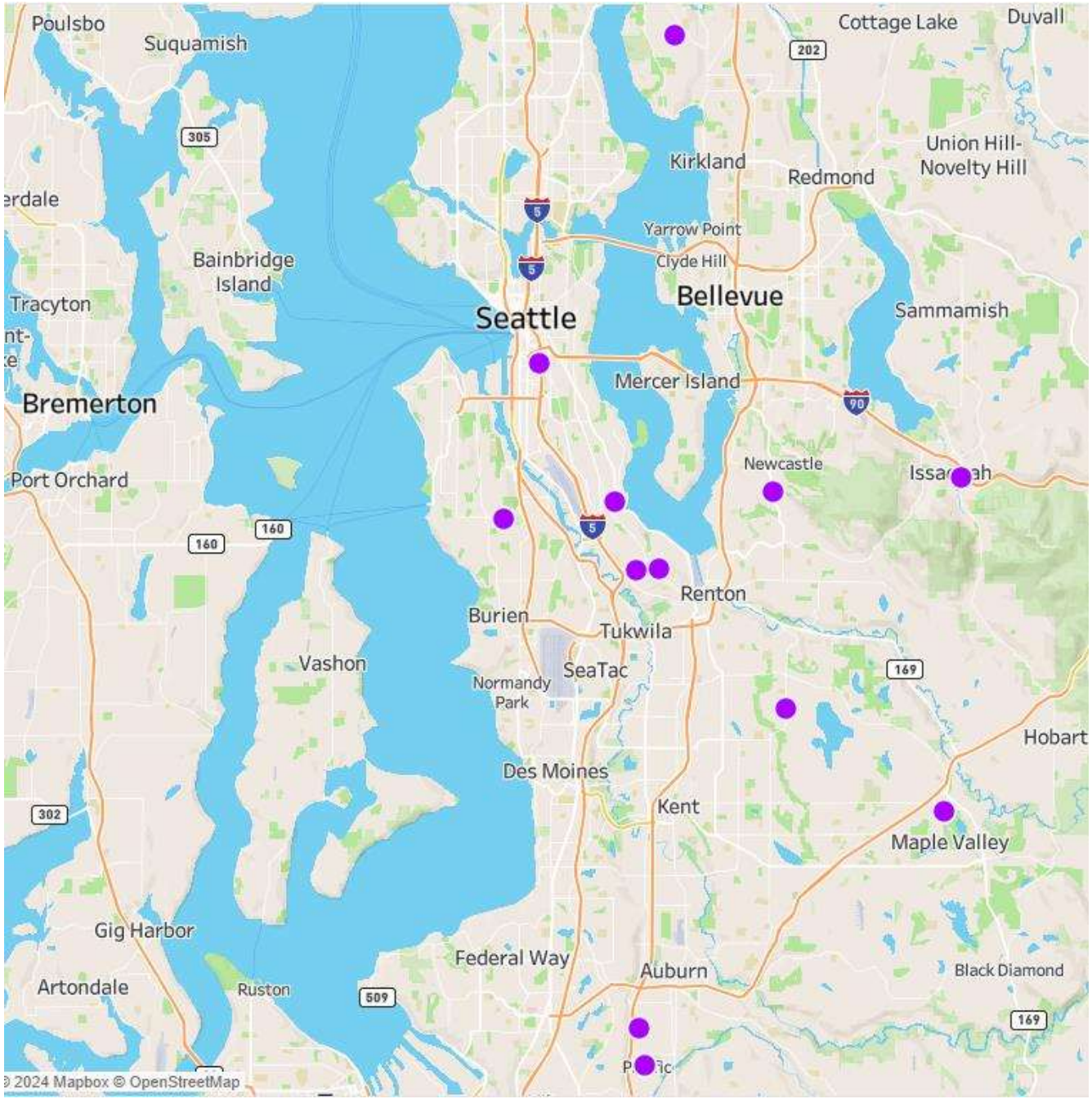
- **Grant funded through the WA Traffic Safety Commission (WTSC)**
- Feedback signs
- Detect Speeding, Distraction and Seatbelt use

PROJECT OVERVIEW

12 locations across KC

- Equity matrix
- 4 sets of signs
- 1 week pre-collection with collector device
- 4 weeks with feedback sign
- 1-2 weeks post collection
  - This schedule shifted throughout the project period

SMART SIGN LOCATIONS – KING COUNTY, WA, MAR-SEPT 2024



DATA FLOW

Sensor collects data at 12 locations across King County

Contractor processes data and prepares analytic file for each location

Data analyst reviews analytic files and conducts analysis

Team develops summary comparing during and post to pre sign deployment

ANALYSIS APPROACH: COMPARE PERCENT OF VEHICLES WITH DETECTED SAFETY BEHAVIOR DURING AND POST TO PRE SIGN IMPLEMENTATION AT EACH SITE

Pre
- No feedback sign

During
- Sign placed & turned on

Post
- Sign removed

Behavior Detected

- Speeding*
- Seat Belt Use
- Driver Phone in Hand

*Speeding categorized as:

- Average speed
- 85th percentile speed
- Any speed > posted limit
- Speed ≥10 MPH posted limit
- Speed categories relative to posted limit

DATA OVERVIEW

Variability in data collection duration and vehicle volume by site and data collection phase

- No post data collection at Airport Way S. location

Data collection included both weekdays and weekends across all phases

- Pacific location had three weekdays (Mon-Wed) of pre data collection

At each site, data collection occurred 7 days a week between the hours of 7AM and 7PM PST.

- Evening hours (5PM – 7PM) had smallest percentage of vehicles across sites and data collection phases

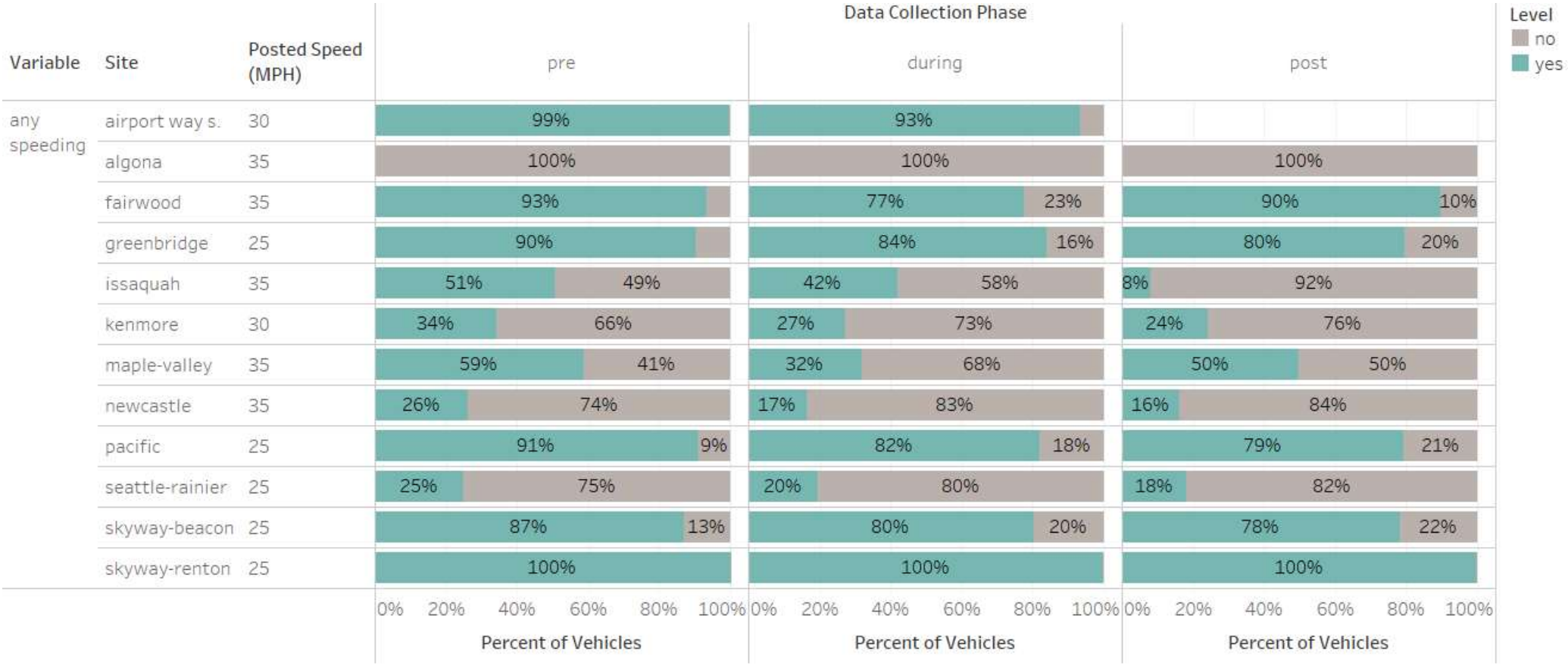
Across all sites and data collection phases, sedans (~50%) and sports utility vehicles (~25%) were most common types of vehicles

VEHICLE SPEEDS

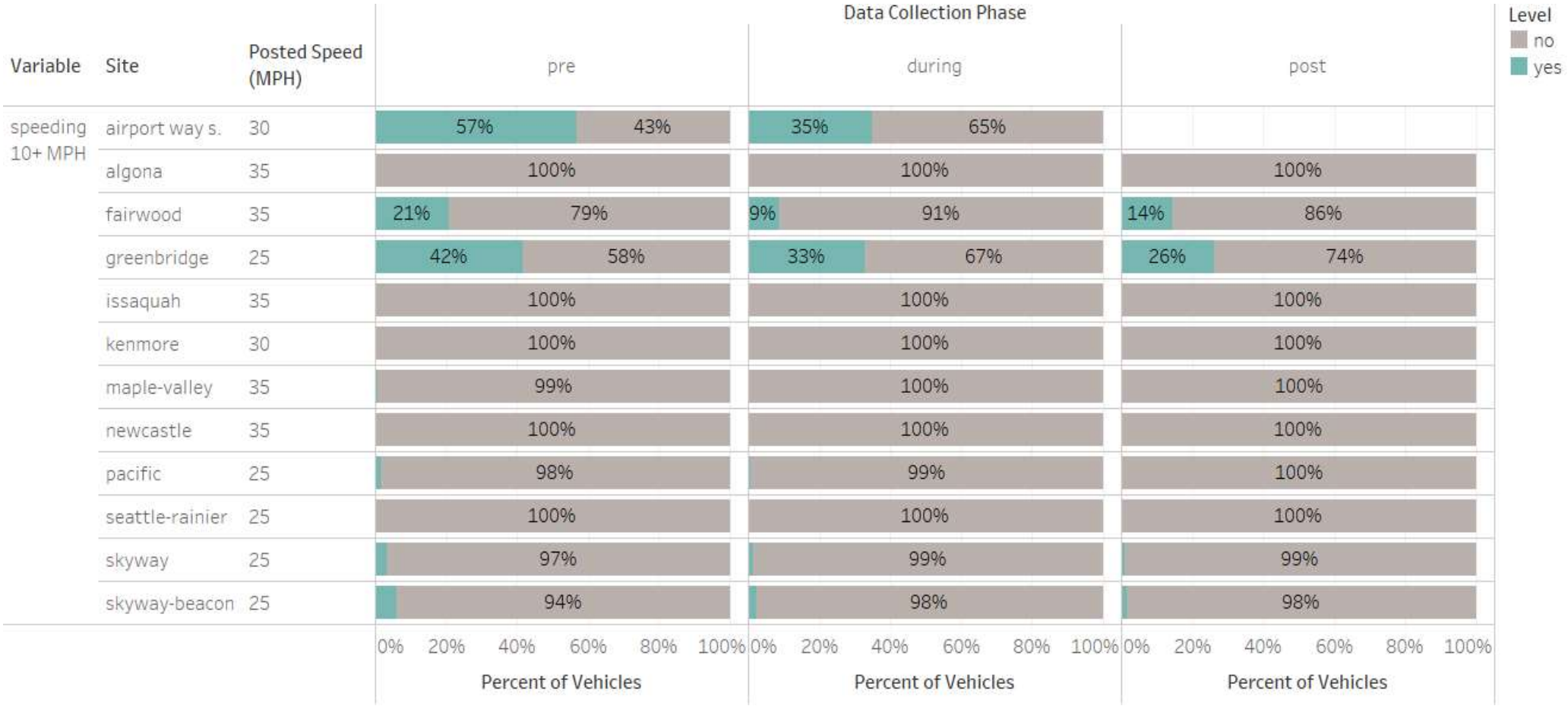
ISSAQUAH SITE HAD MOST NOTABLE CHANGES.

LITTLE VARIATION IN BOTH AVERAGE AND 85TH PERCENTILE SPEEDS* AMONG SITES ACROSS PHASES

*Speed at which 85% of free-flowing vehicles drive at or below



THROUGHOUT ALL PHASES OF DATA COLLECTION, NO VEHICLES PASSING THE ALGONA SITE WERE DETECTED EXCEEDING POSTED 35 MPH SPEED LIMIT

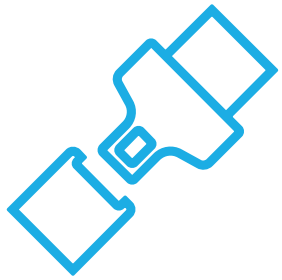


MAJORITY OF SITES DID NOT HAVE VEHICLES TRAVELING ≥ 10 MPH ABOVE POSTED ROADWAY LIMIT ACROSS DATA COLLECTION PHASES.

POSITIVE SHIFTS IN PERCENT OF VEHICLES TRAVELING AT OR BELOW ROADWAY POSTED LIMIT DURING AND POST SIGN DEPLOYMENT AT ISSAQUAH, KENMORE, NEWCASTLE, AND SEATTLE—RAINIER AVE S. LOCATIONS

SEAT BELT USE

Driver and front passenger, if present



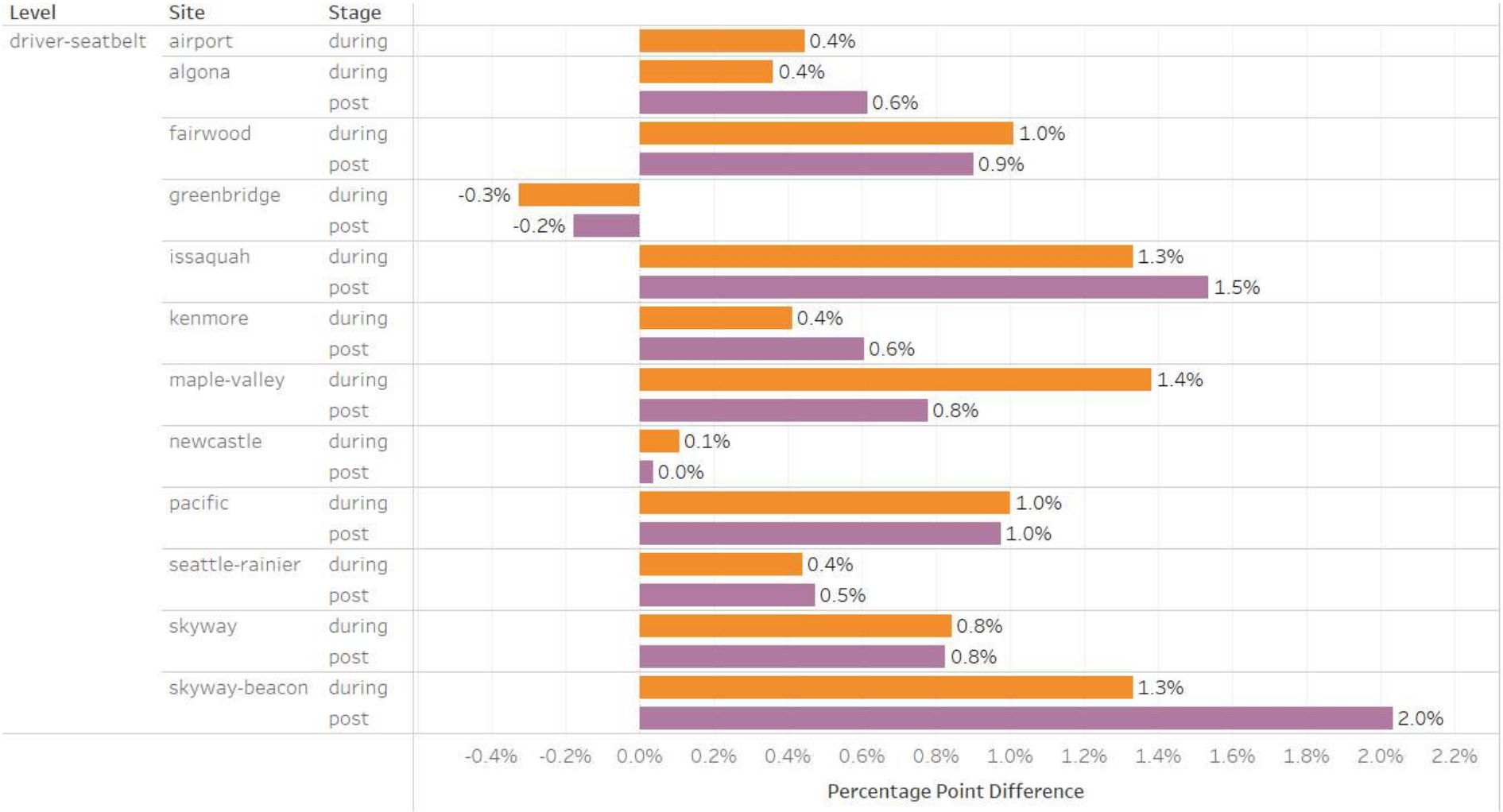
PERCENT OF VEHICLES WITH A BELTED DRIVER* WERE LOWER THAN KING COUNTY PUBLISHED ESTIMATES WITH NO SUBSTANTIAL CHANGES ACROSS DATA COLLECTION PHASES

2023 King County Seat Belt Use Estimates

WTSC Statewide Survey: 94%

Statewide Observation Study: 95.5%

*Among vehicles where seat belt was detectable



SMALL PERCENTAGE POINT INCREASES IN VEHICLES WITH BELTED DRIVER* DURING OR POST, COMPARED TO PRE, INTERVENTION

*Among vehicles where seat belt was detectable

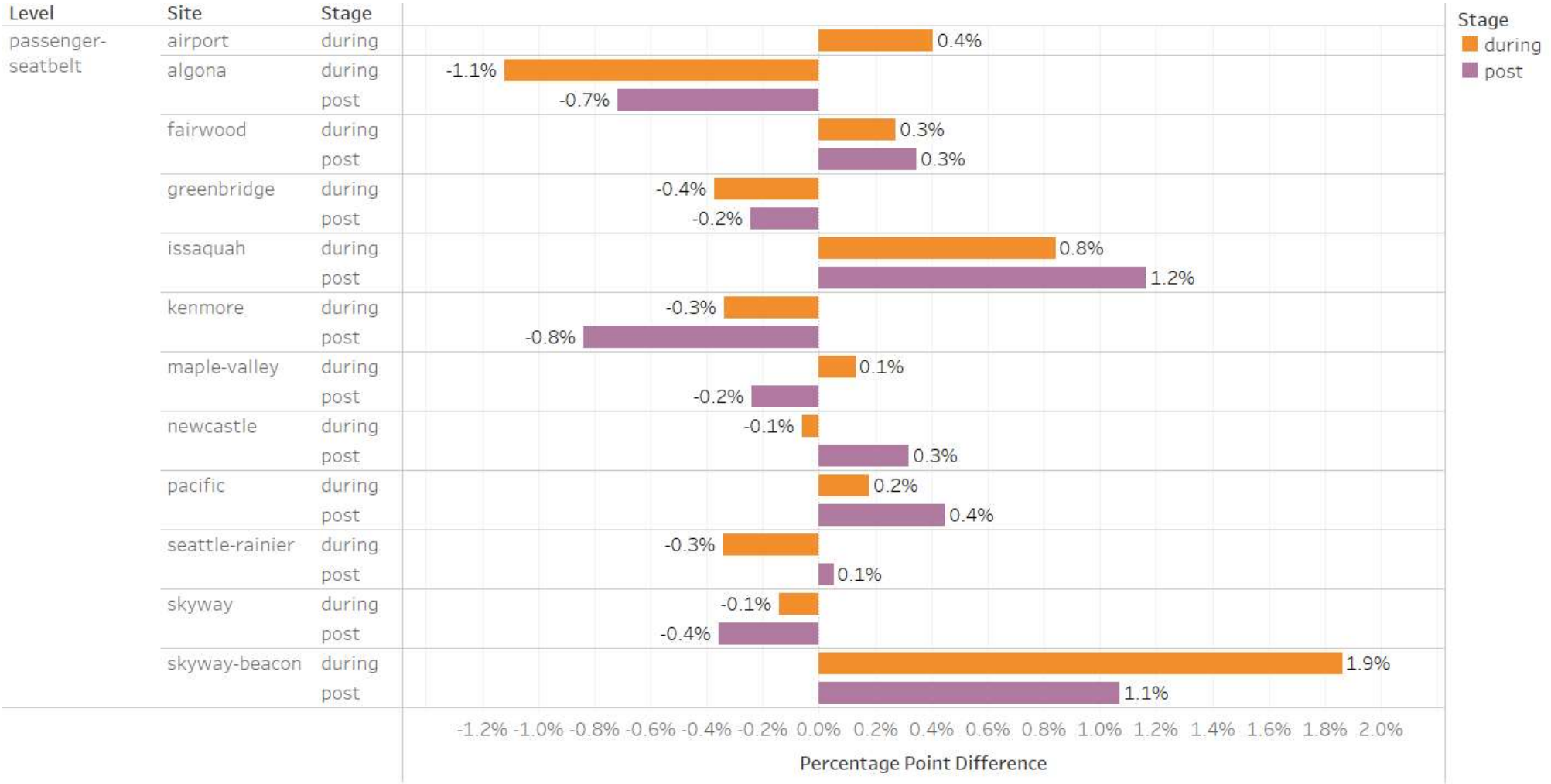
ACROSS THE 12 SITES, PERCENT OF VEHICLES WITH A BELTED FRONT PASSENGER* RANGED FROM 86% TO 92% DURING AND POST SIGN DEPLOYMENT

2023 King County Seat Belt Use Estimates

WTSC Statewide Survey: 94%

Statewide Observation Study: 95.5%

*Among vehicles where a front passenger was detected



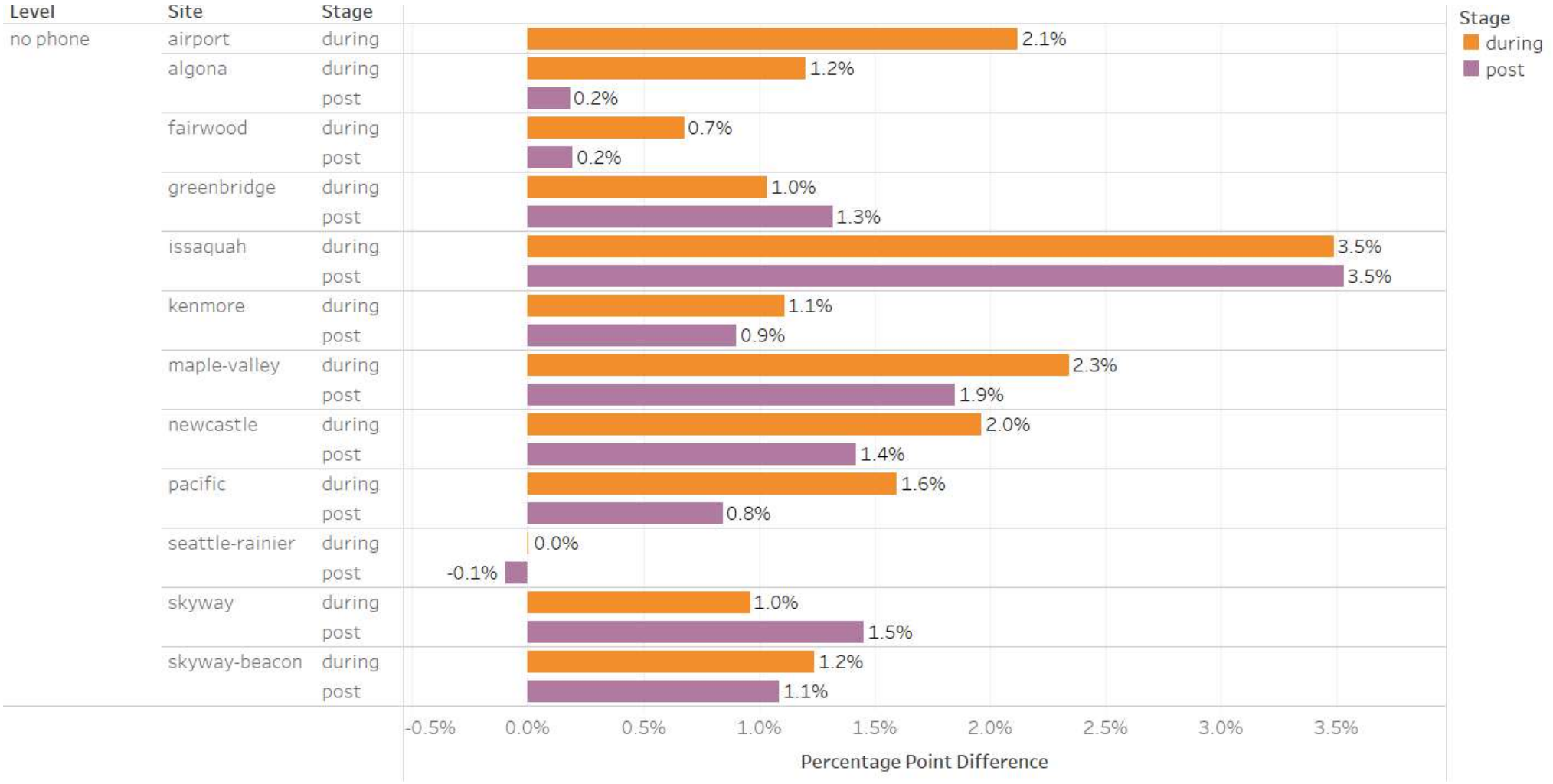
FEWER THAN TWO PERCENTAGE POINT INCREASES FOR VEHICLES WITH BELTED FRONT PASSENGER* DURING OR POST, COMPARED TO PRE, INTERVENTION

*Among vehicles where a front passenger was detected

DRIVER PHONE IN HAND

HIGH PERCENT OF VEHICLES* WHERE DRIVER HAD WITH NO PHONE IN HAND ACROSS SITES IN EACH DATA COLLECTION PHASE

*Among vehicles where phone in hand was detectable



ISSAQUAH SITE HAD MOST GAIN OF 3.5 PERCENTAGE POINTS WHERE DRIVER HAD NO PHONE IN HAND* DURING OR POST, COMPARED TO PRE, INTERVENTION

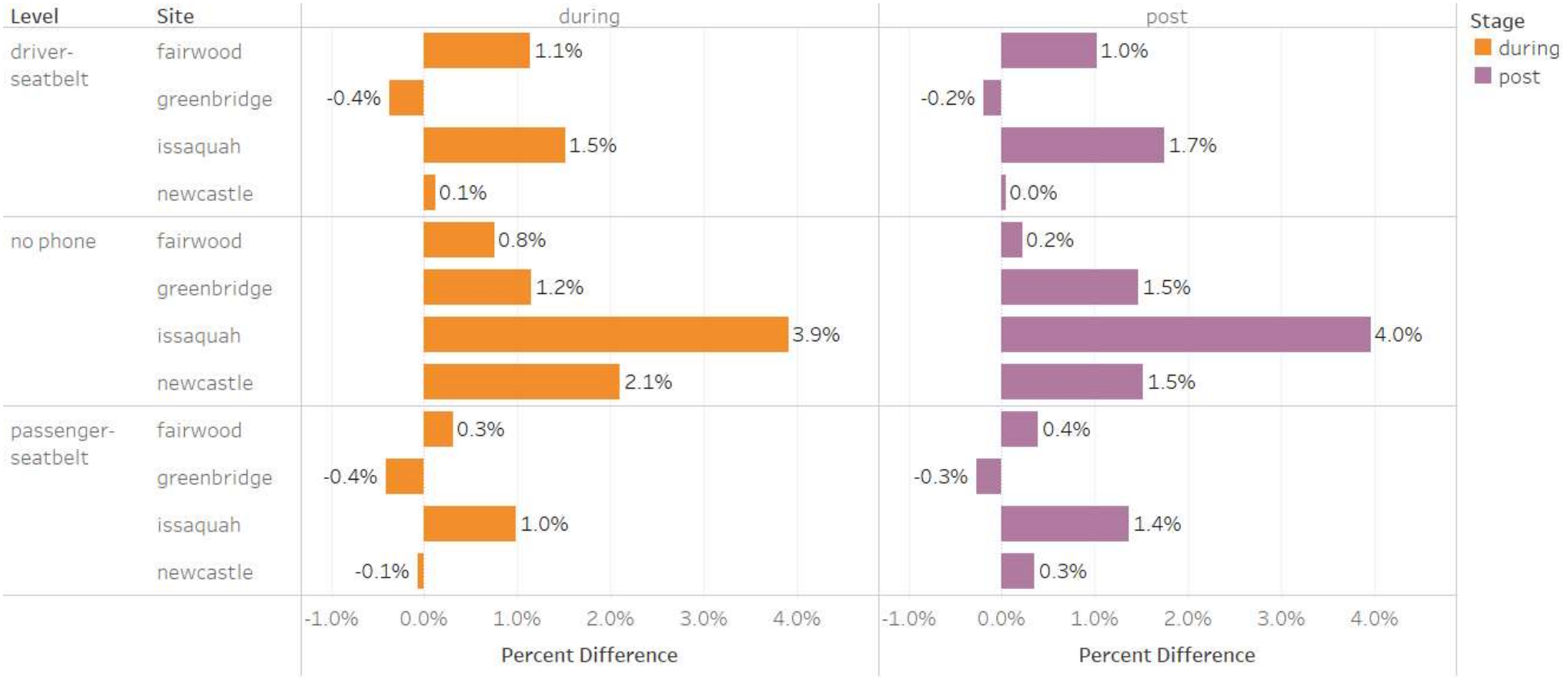
*Among vehicles where phone in hand was detectable

Highlight of site-specific results

Four Sites*

- Fairwood
- Greenbridge
- Issaquah
- Newcastle

*Selected based on minimal data collection challenges



LARGEST CHANGE* IN TRAFFIC SAFETY BEHAVIOR WAS AT ISSAQUAH SITE WITH 4% INCREASE IN DRIVERS WITH NO PHONE IN HAND DURING AND POST, COMPARED TO PRE, INTERVENTION

*Percent change compared to pre intervention

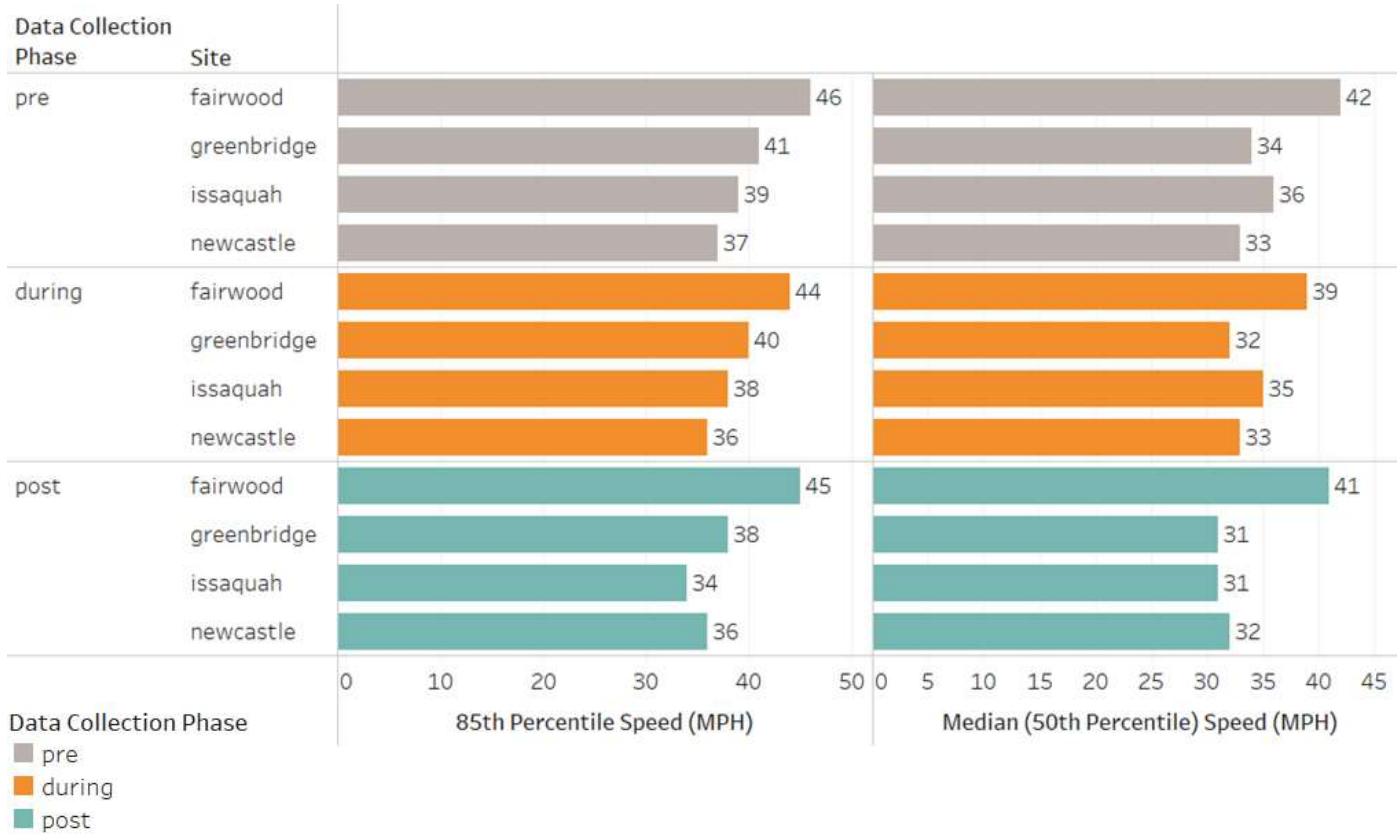
85TH PERCENTILE* & MEDIAN SPEEDS OFTEN EXCEEDED POSTED ROADWAY LIMITS ACROSS SITES AND DATA COLLECTION PHASES

35 MPH posted limit

- Fairwood
- Issaquah
- Newcastle

25 MPH posted limit

- Greenbridge



*Speed at which 85% of free-flowing motorists drive at or below

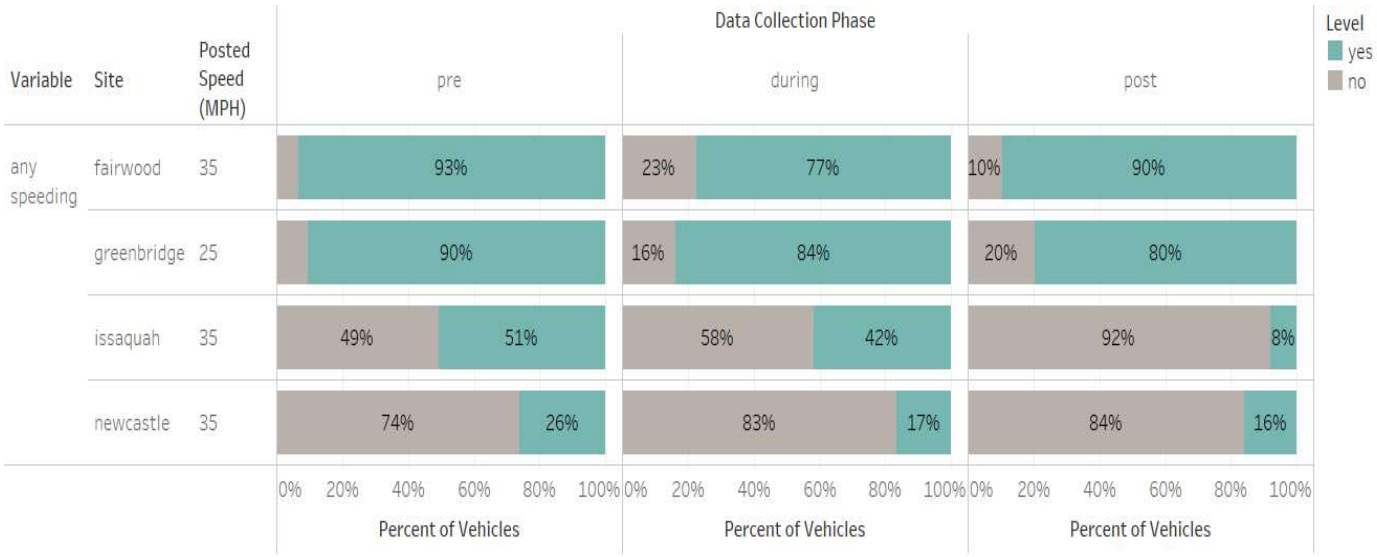
FAIRWOOD & GREENBRIDGE HAD HIGHER PERCENT OF MOTORIST TRAVELING ANY SPEED ABOVE POSTED LIMIT

Fairwood & Greenbridge sites

- Small reductions in motorists traveling above posted limited

Issaquah & Newcastle sites

- Lager reductions in motorists traveling above posted limit



VARIABLE CHANGES IN EXCESSIVE SPEEDING (≥ 10 MPH) RELATIVE TO POSTED SPEED BY DATA COLLECTION PHASE AND SITE

Fairwood & Greenbridge sites

- Decrease in motorists traveling ≥10 MPH above posted limit

Issaquah & Newcastle sites

- No motorists traveling ≥10 MPH above posted limit

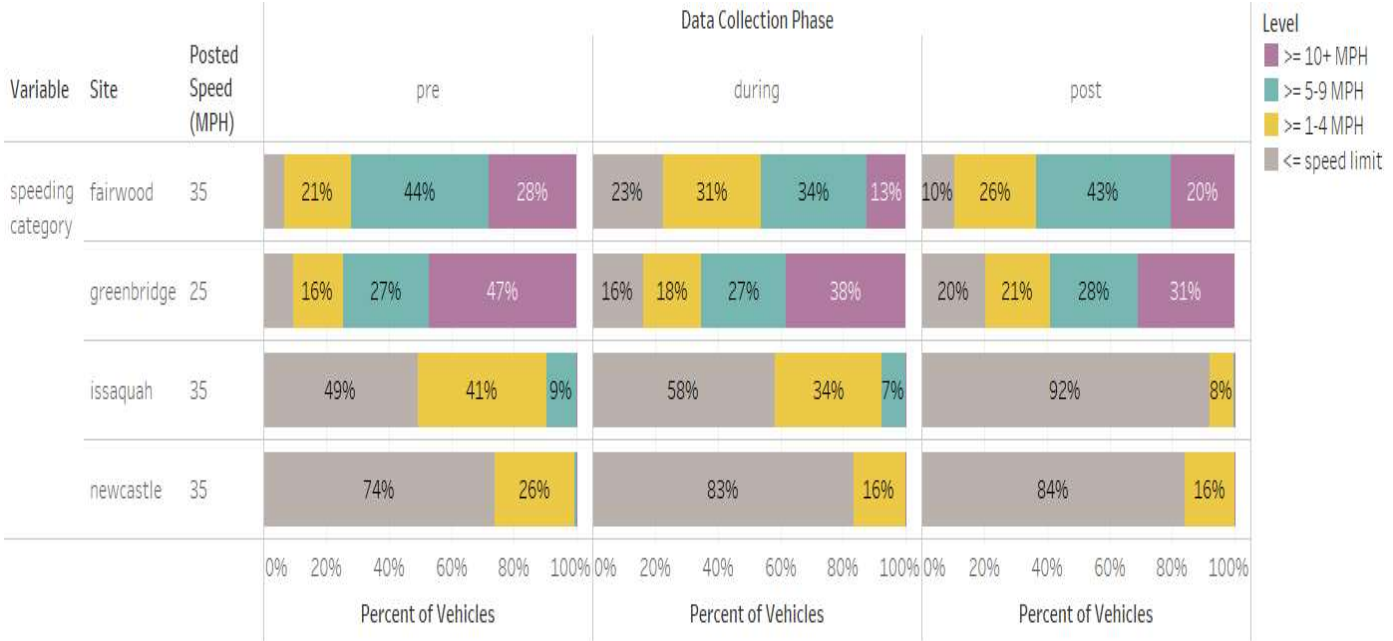
OBSERVED DECREASE IN VEHICLES TRAVELING ≥10 MPH OR 1-3 MPH ABOVE POSTED ROADWAY LIMIT DURING AND POST SIGN DEPLOYMENT

Fairwood & Greenbridge sites

- Decrease in motorists traveling ≥10 MPH above posted limit

Issaquah & Newcastle sites

- Decrease in motorists traveling 1-4 MPH above posted limit
- Increase in motorists traveling at/below posted limited



DATA LIMITATIONS AND CAVEATS

Variability across sites in data collection duration, seasonality, and traffic volumes

- Interpret cross-site comparisons with caution; other factors could contribute to observed changes.

Lower estimate for seat belt use could be impacted by data collection/detection issues

Unknown driver seat belt use classified in situations where:

- there are objects blocking the driver (e.g., objects hanging from rear view mirror)
- vehicle is not fully in lane
- bright/dark light on the windshield

Driver-incorrect-seatbelt classified as ”no seat belt”

SUMMARY TAKEAWAYS

Moderate decrease in speed at some locations during and post sign implementation

Little to no change in seat belt use and phone in hand during or post sign implementation

- % changes during: -0.4% - 1.6% (driver belted); -1.2 -2.1% (passenger belted); 0.8% - 3.9% (no phone)
- % changes post: -0.2% - 1.7% (driver belted); -1.0% - 1.4% (passenger belted); -0.1% - 4.0% (no phone)

Percent of vehicle with seatbelt use lower than published rates from self-report and observational studies

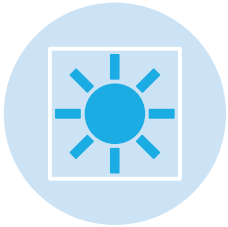
- Range: 84%-91% (pre); 85%-91% (during & post)

Sizeable percentage of vehicles with driver unknown seatbelt use or not detectable due to glare

- Excluded data ranged from 11%-12% of vehicles across sites and phases

LESSONS LEARNED/TECHNOLOGY CONSIDERATIONS

Potential for equipment theft/vandalism



Solar operation issues

Vehicle traffic striking equipment

Dynamic feedback sign operation issues

THANK YOU

For questions contact King County Target Zero at:
trafficsafety@kingcounty.gov