

Fehr & Peers

Innovative Mobility: Near Miss Analytics

in Thornton, Colorado

Charles Alexander, PE, AICP, RSP1 | June 30, 2026

Special Thanks

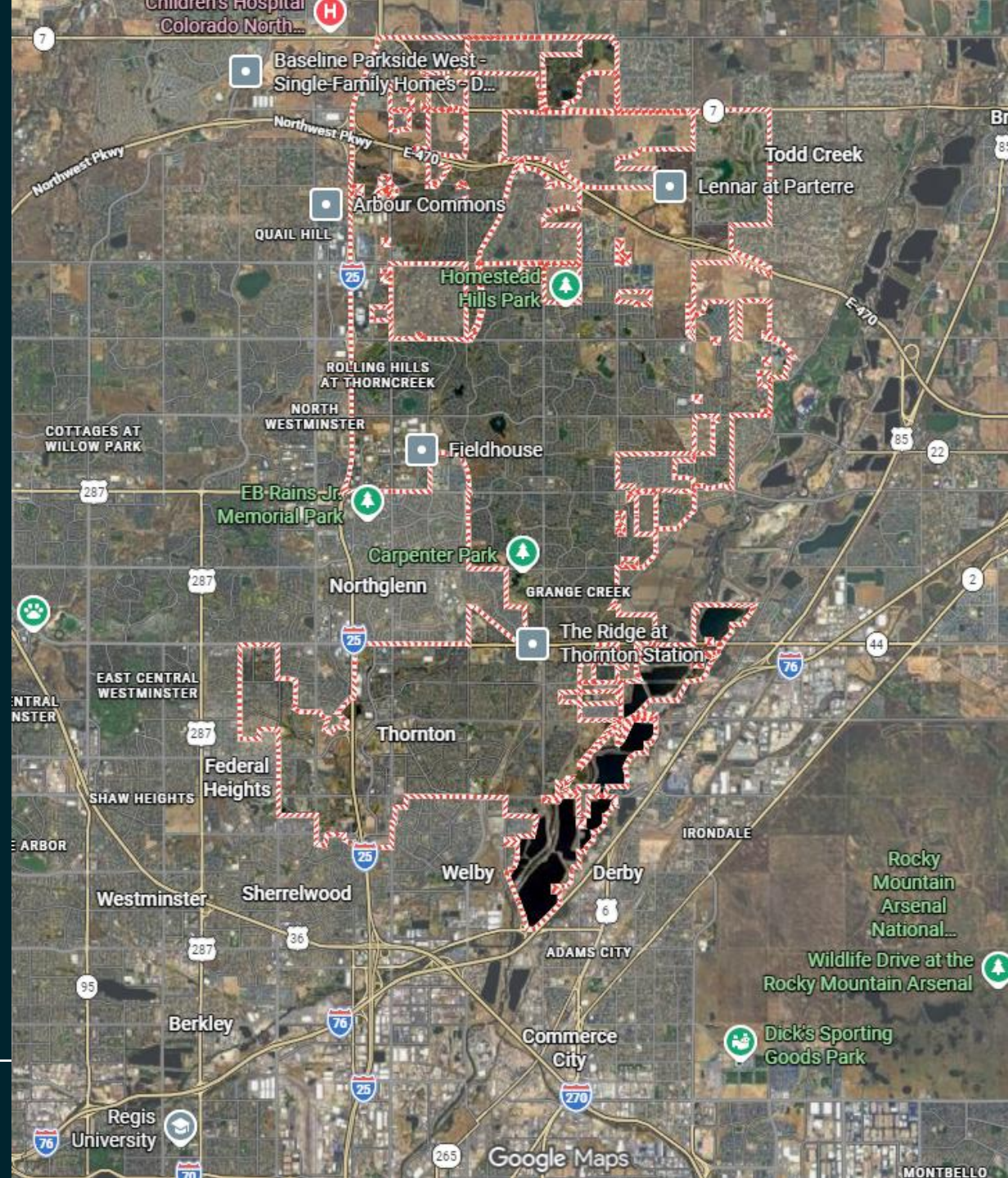
**City of Thornton,
Colorado**

**Denver Regional
Council of
Governments
(DRCOG)
Innovative Mobility
Set-Aside**

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Background

- Innovative Mobility Set-Aside program pilot
- City of Thornton, Colorado
 - Denver region
 - Population 150,000, 4,200 people per square mile (similar to Tacoma)
 - Vision Zero Plan adopted in 2024
- Studied 10 signalized intersections
- 2 weeks of video processed into near miss data (Quality Counts)



Our Questions

What countermeasures will most improve safety at the 10 study intersections?

What are the recommended uses for near miss data?

- Where does near miss data correlate with easily-available data (e.g., crash history, intersection turning movement counts, etc.)?
- Where does near miss data provide something unique?
- What else can we learn from this data?

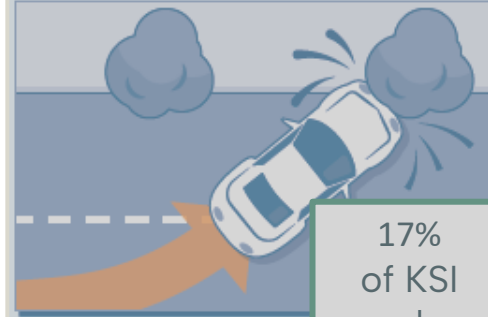
Thornton Vision Zero Crash Profiles

70 percent of severe crashes.

Based on 2020 to 2024 crash data for these 10 intersections, the focus of the near miss analysis is around these five profiles:

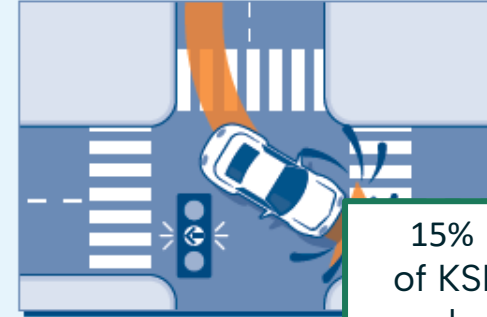
1. Left Turn Crash at Signalized Intersections
2. Red-Light Running Crashes
3. Pedestrian or Bicyclist Crossing Against the Signal
4. Right Turn on Red Pedestrian or Bicyclist Crash
5. Right Turn Pedestrian Crash at Signalized Intersections

Run-Off-The-Road Crashes



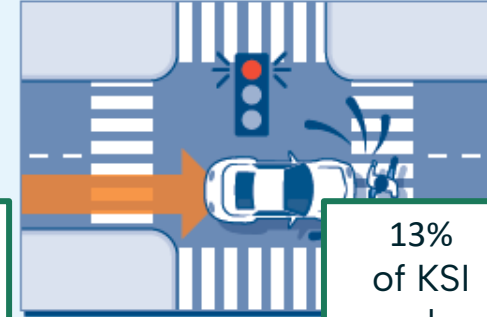
17%
of KSI
crashes

Left Turn Crash at Signalized Intersections



15%
of KSI
crashes

Red-Light Running Crashes



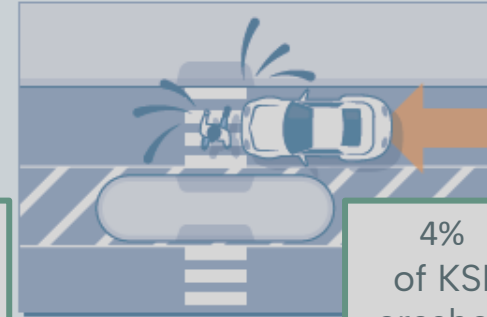
13%
of KSI
crashes

Broadside or Left Turn Crash at Unsignalized Intersections or Driveways



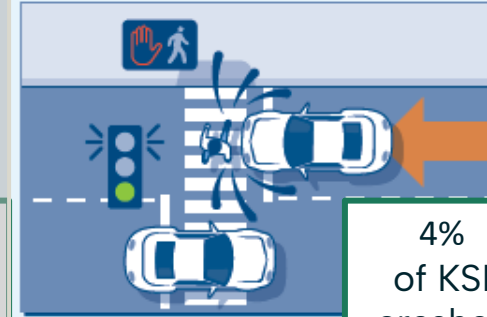
12%
of KSI
crashes

Pedestrian or Bicyclist Crossing Major Street at Unsignalized Locations



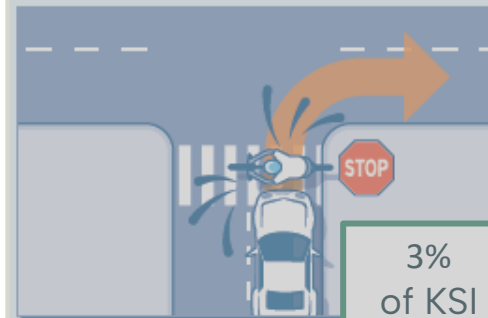
4%
of KSI
crashes

Pedestrian or Bicyclist Crossing Against the Signal



4%
of KSI
crashes

Side-Street Crosswalk Crash



3%
of KSI
crashes

Right Turn on Red Pedestrian or Bicyclist Crash



2%
of KSI
crashes

Right Turn Pedestrian Crash at Signalized Intersections



1%
of KSI
crashes

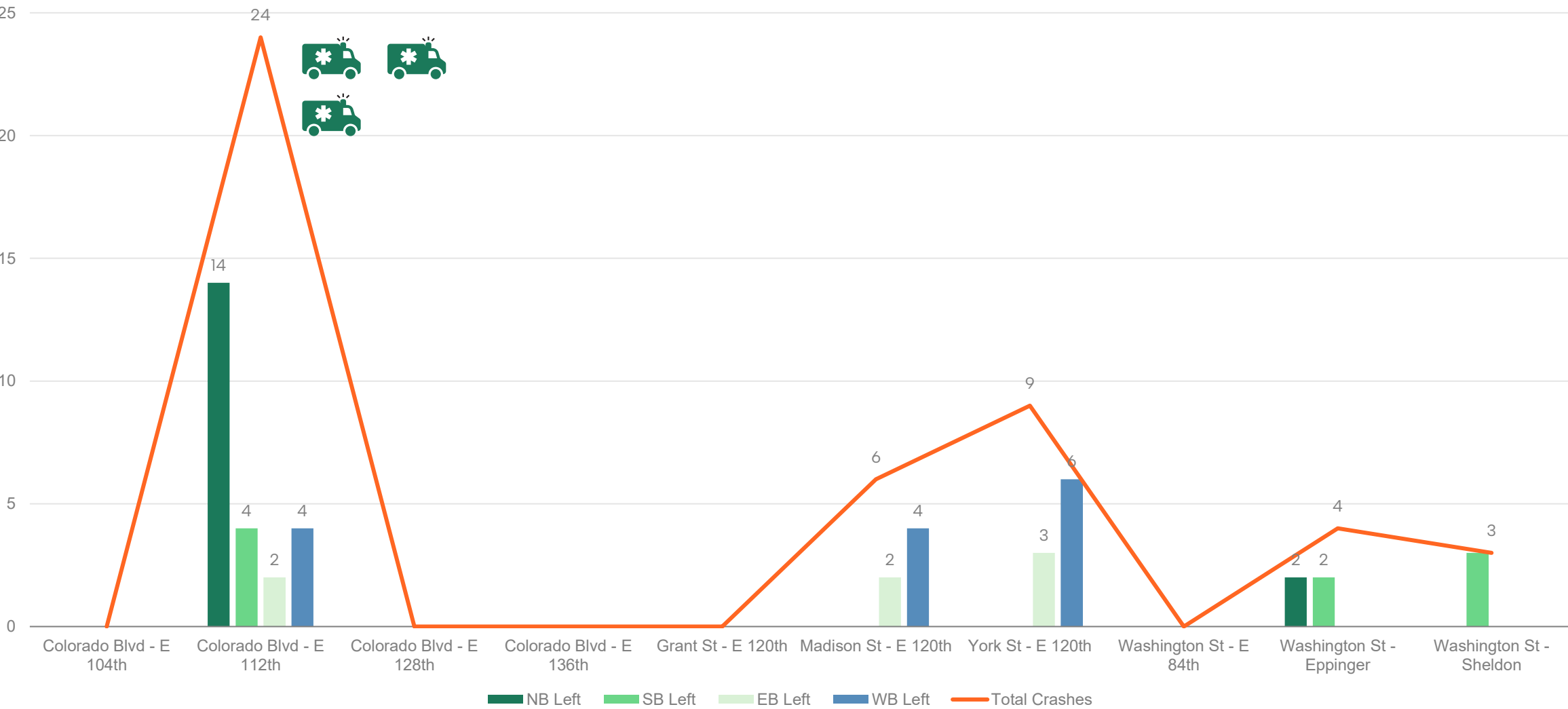
402578 2025/10/18 14:14:44



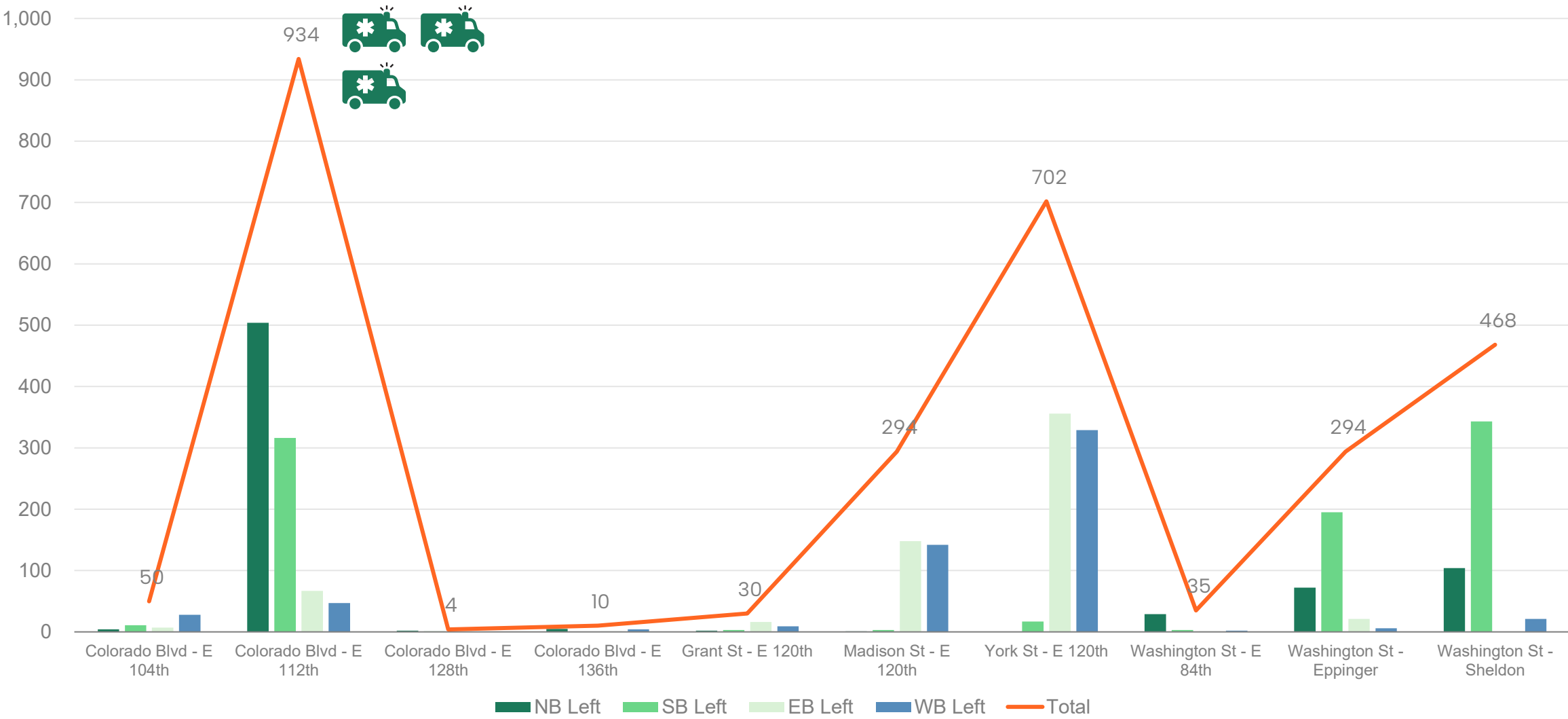
Vehicle
-vehicle
Left-turn

QualityCounts.net

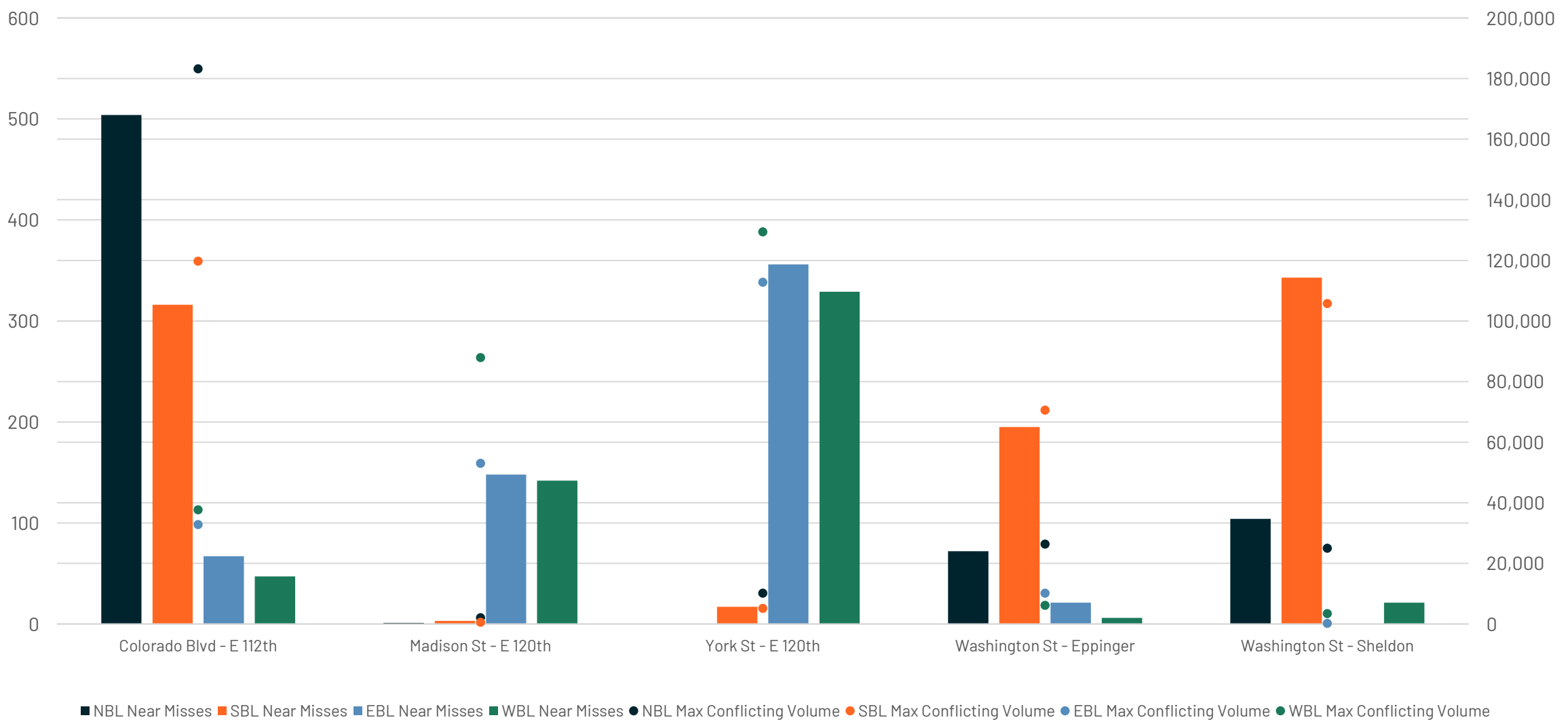
Veh – Veh Left Turn at Signalized Intersection Crashes (2020-2024)



Veh – Veh Left Turn at Signalized Intersection Near Misses



Left Turn Veh-Veh Near Misses vs Max Conflicting Vehicle Volume



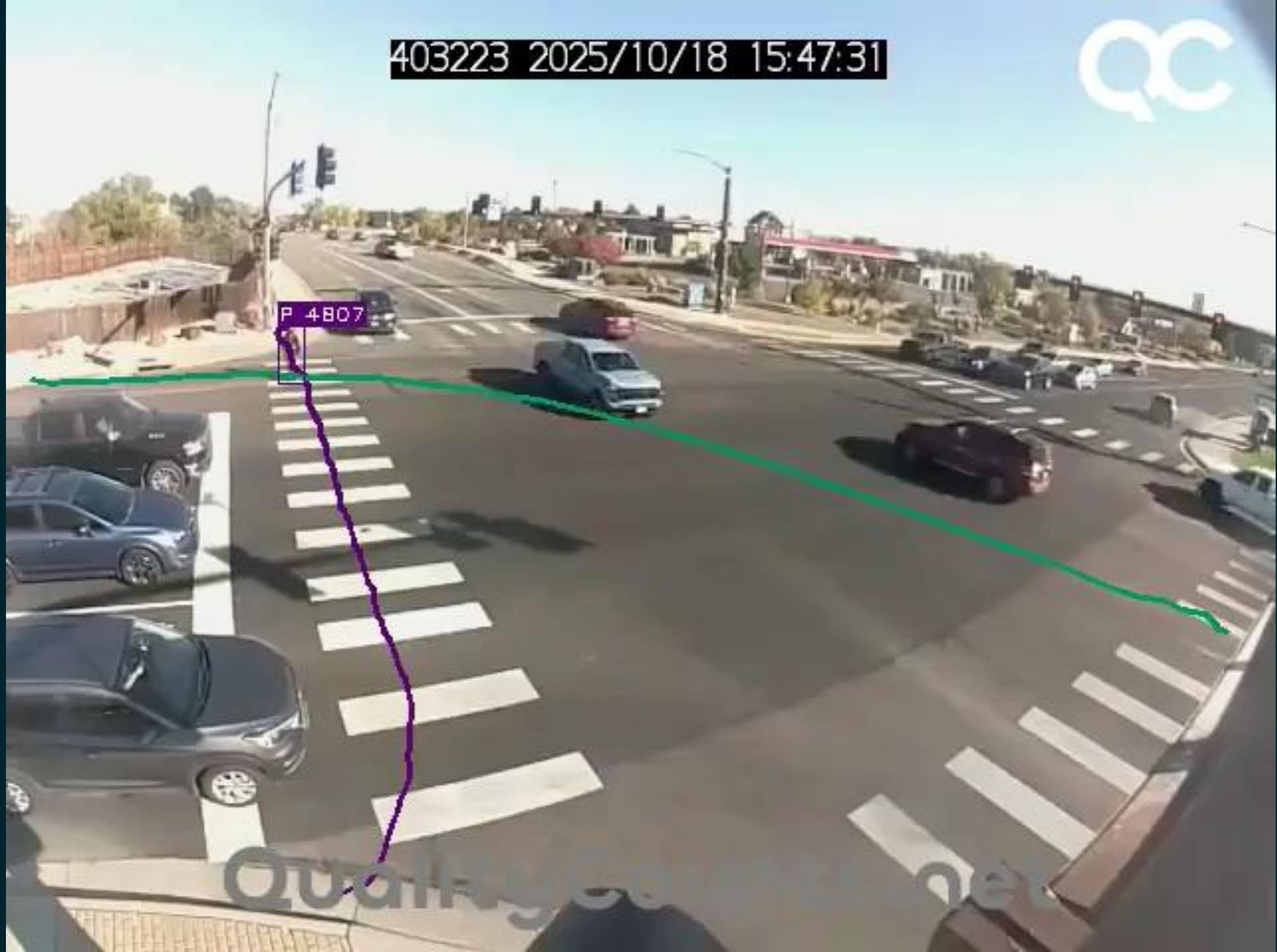
403223 2025/10/18 15:47:31



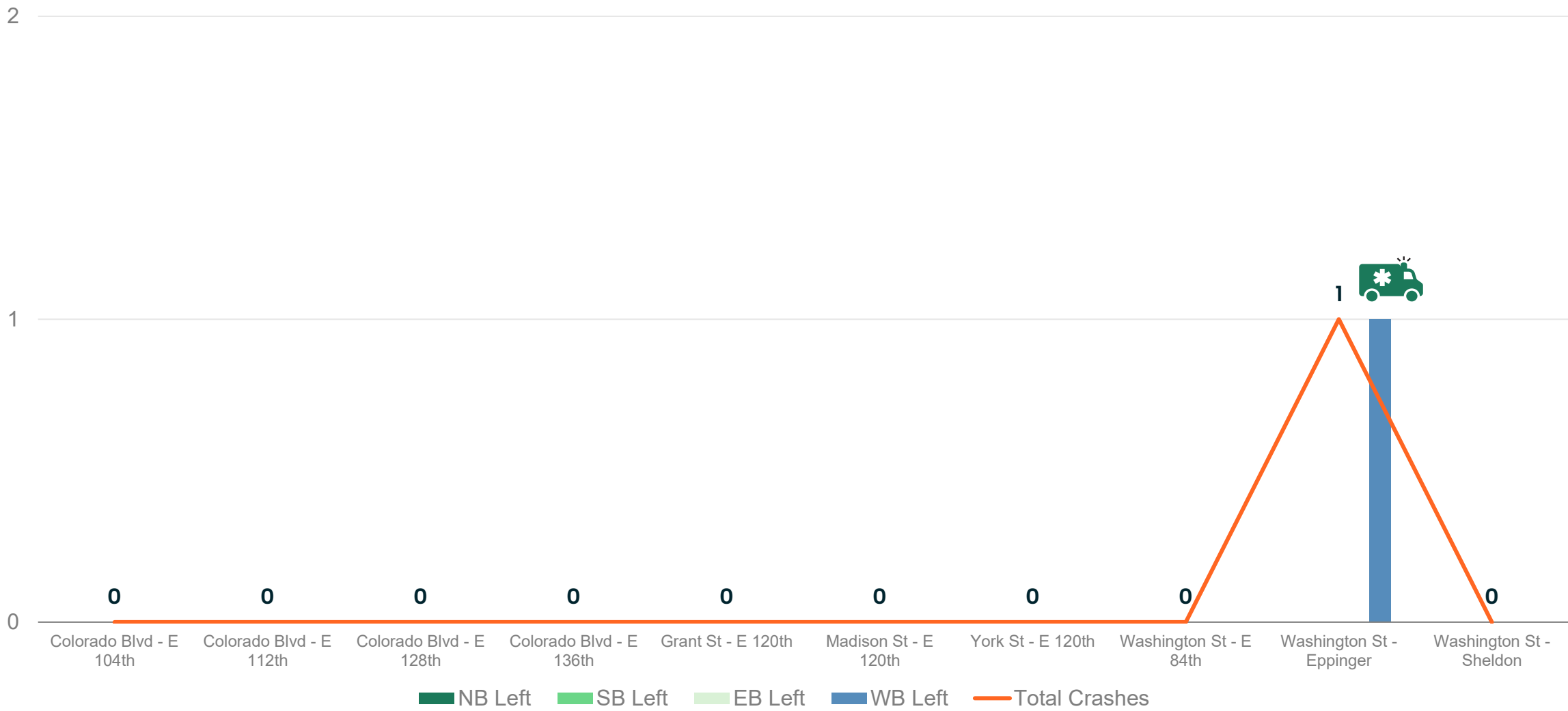
P 4807

Vehicle-
pedestrian
Left-turn

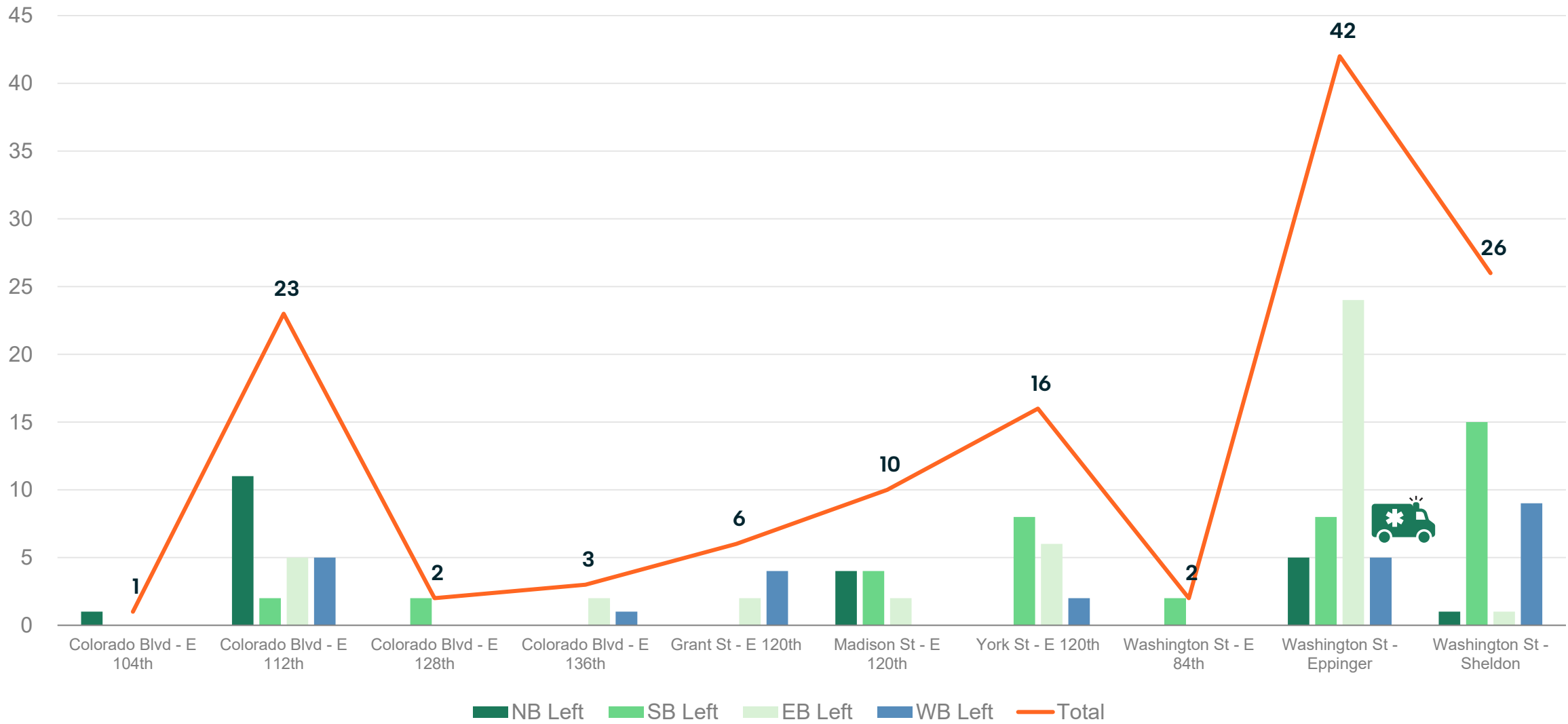
QualityControl.net



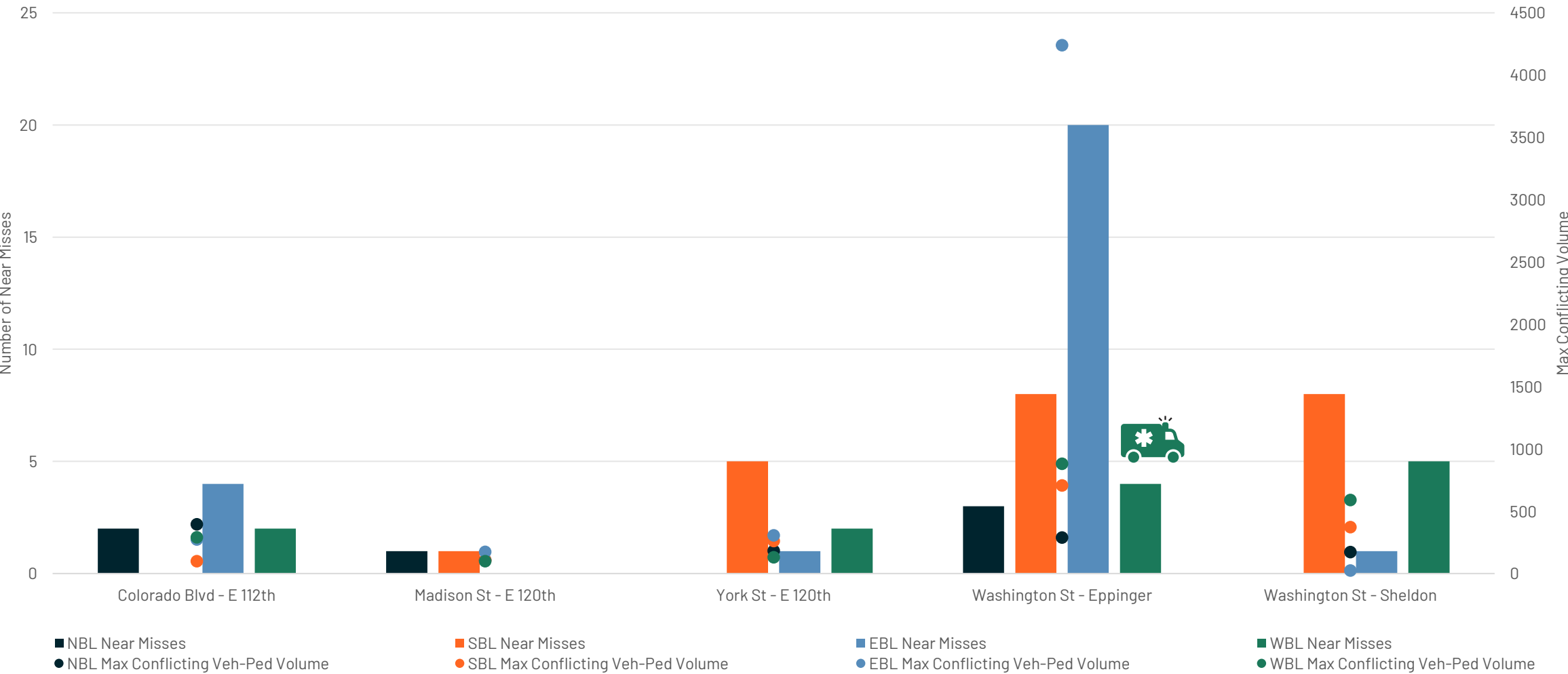
Left Turn with Ped/Bike Crashes (2020-2024)



Left Turn Conflicts with Bike/Peds Near Misses



Left Turn Veh-Ped Near Misses vs Max Conflicting Veh-Ped Volumes



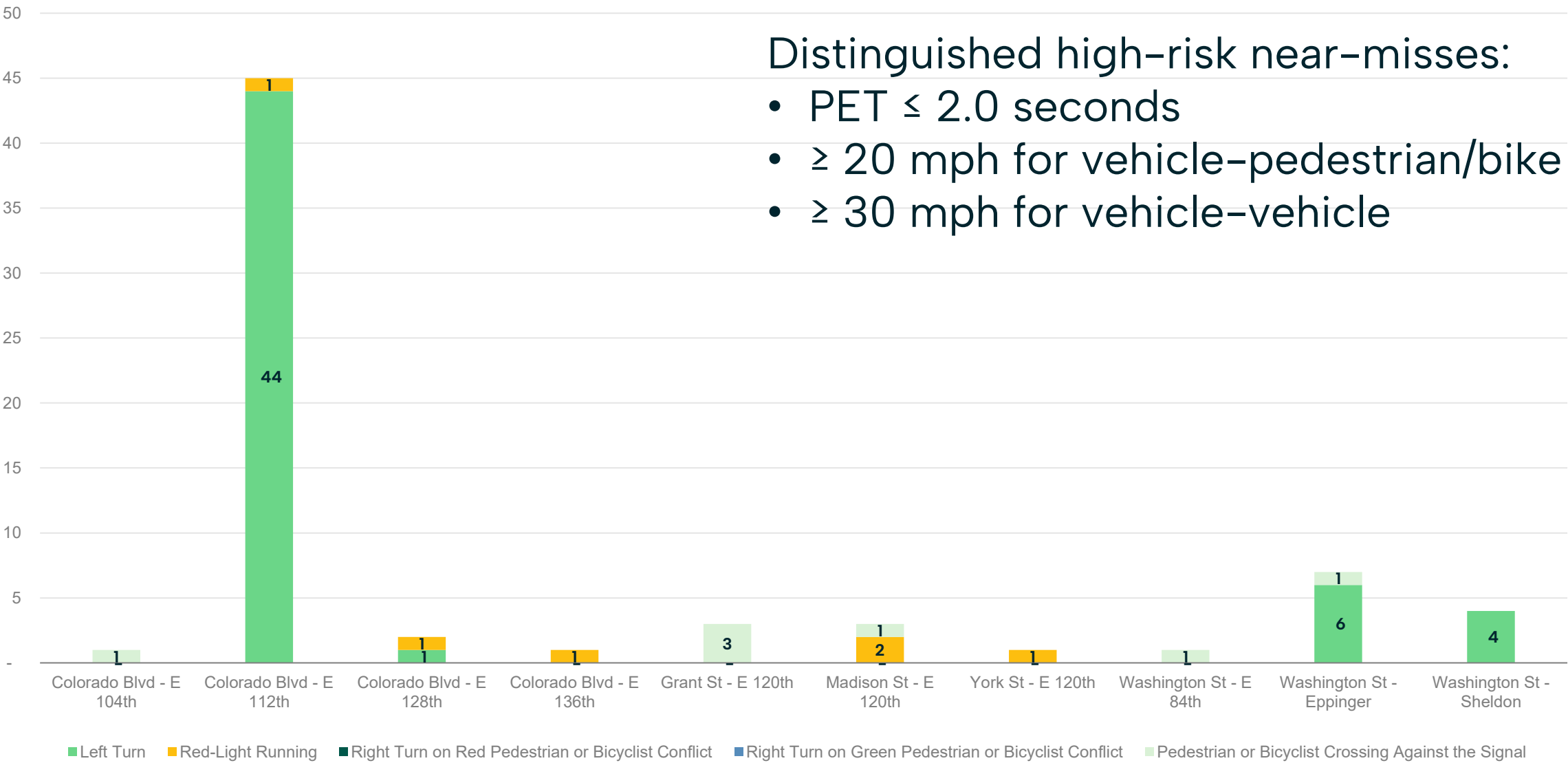
403956 2025/10/21 09:41:33



**Vehicle-
pedestrian
Right-turn
(On Red or
Green)**



High Risk Near Miss Profile Summary by Intersection



403973 2025/10/19 05:25:14



Red Light Running

- Through vs. left
- Start of red vs. stale red vs. "stop and go"



QualityCounts.net

Pedestrians Crossing Against Signal

- Everywhere



Source: Vision Zero Network

- Need innovations for pedestrian delay in suburban environments



Conclusions



Where does near miss data correlate with easily-available data (e.g., crash history, intersection turning movement counts, etc.)?

- Left turn crashes at signalized intersections (vehicle-vehicle)



Where does near miss data provide something unique?

- Left turn crashes at signalized intersections (vehicle-pedestrian or vehicle-bicyclist)
- Pedestrian or bicyclist crossing against the signal
- Right turn crashes at signalized intersections.... sort of (vehicle-pedestrian or vehicle-bicyclist)



What else did we learn?

- Red light running crashes, near misses, and volume were hard to correlate with one another
- Helpful highlight reels by crash profile
- Qualitative data = better storytelling
- More locations, less recording time to inform countermeasure thresholds, measures of predictive safety (i.e., How many near misses before a crash? How to monetize near misses for BCA?)

Conclusions

Using near miss to inform installation warrants/thresholds

Reactive safety

Only install countermeasure with crash history

Reactive thresholds:

install countermeasure if X crashes or X near-misses

Proactive thresholds:

install countermeasure unless it can be demonstrated that near-misses are not occurring

Proactive safety

Install countermeasure everywhere



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