



Near-Miss Data at Scale

Case Studies in Proactive Traffic Safety

Session 7C – Video Analytics & Multimodal Safety

Raymond Poss

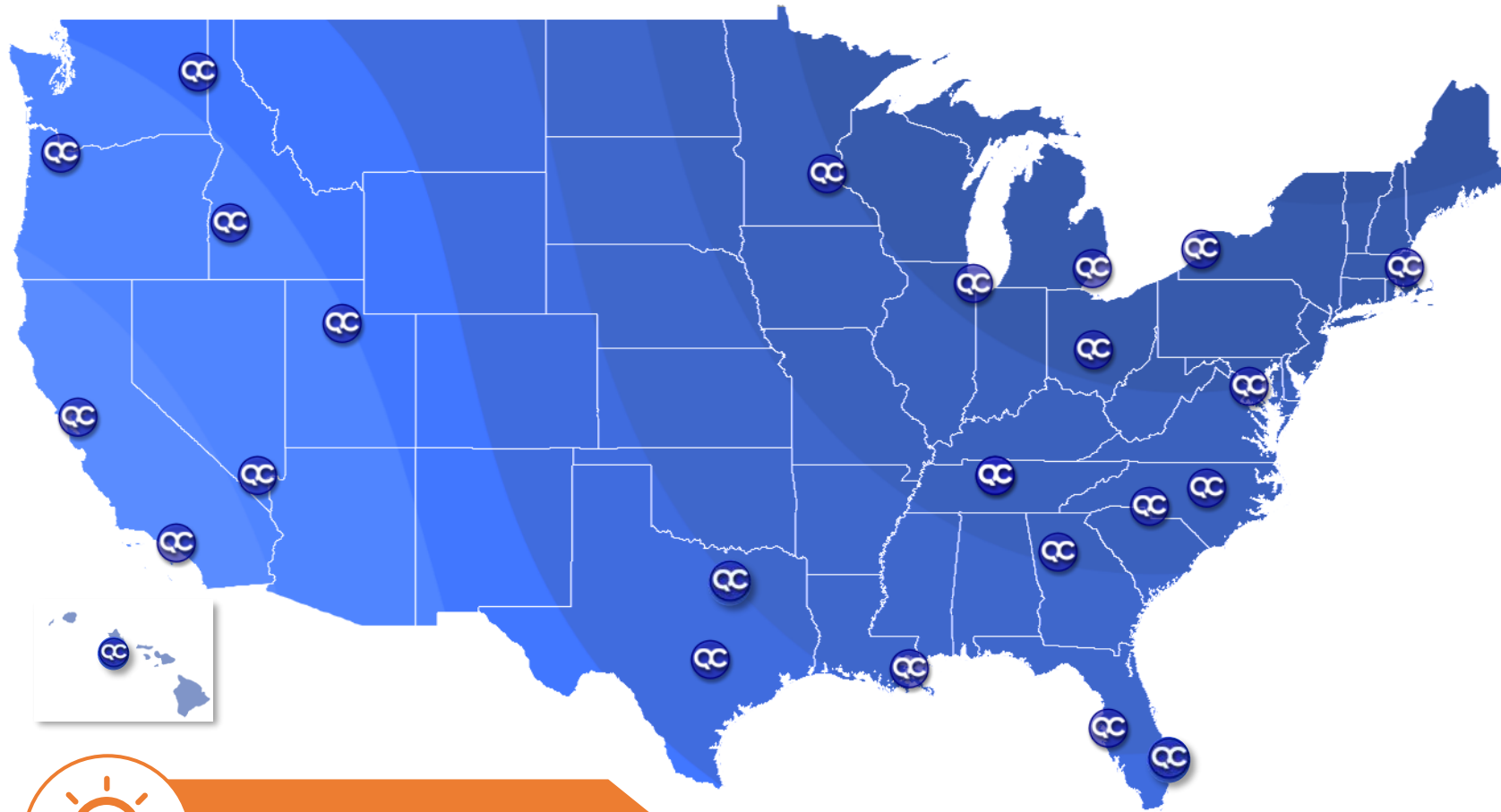
Safety Analytics Lead | Quality Counts



June 30, 2026



Quality Counts: About Us



Serving Clients in
All 50 States & Beyond



Typical Studies



Turning Movement Counts



Volume, Speed & Classification



Queue, Gap, & Delay



Bike & Pedestrian Counts



Parking & Curb Studies



Travel Time & O-D



Sidewalk & Asset Inventory



Innovations



Near-Miss
Safety Analytics



Automated
SPaT Reports



Traffic Data
Management

Trusted Data Partner for
6k+ Engineers & Planners



Crashes: Essential Data... ...But Reactive



Small sample sizes



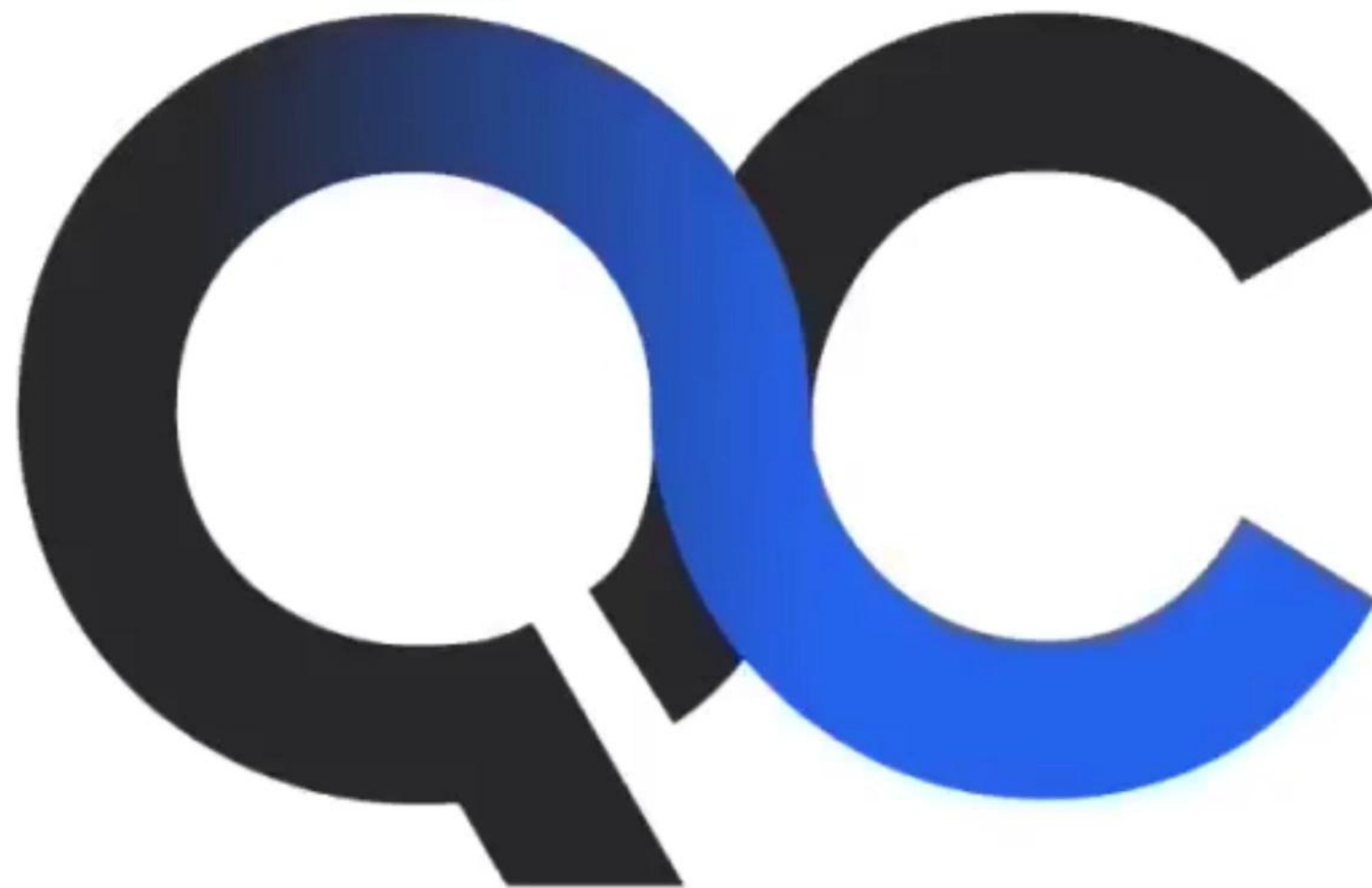
Underreporting



Limited agency resources



Slow feedback loop



TRUE DATA TO IMPROVE MOBILITY

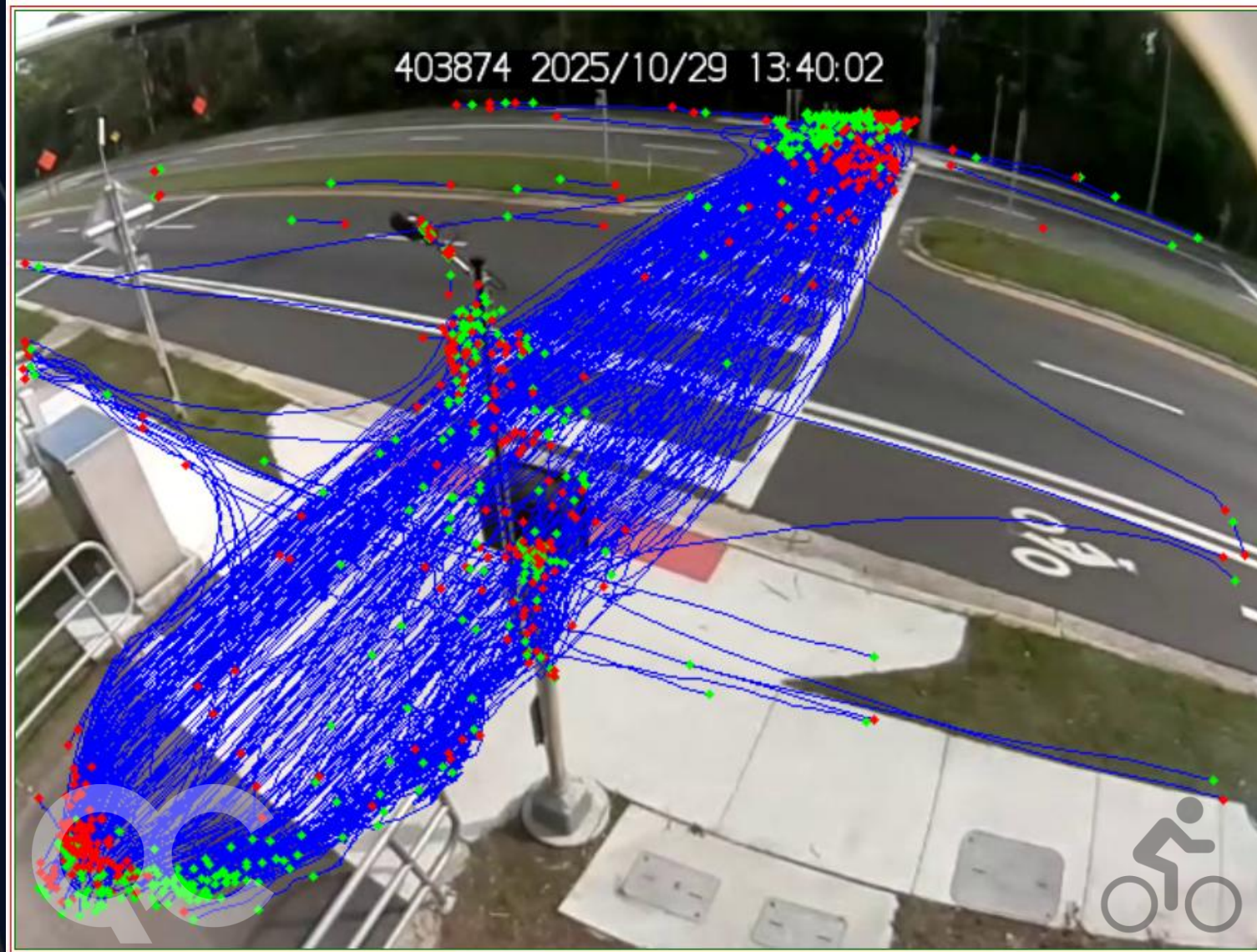
Data Collection & Processing



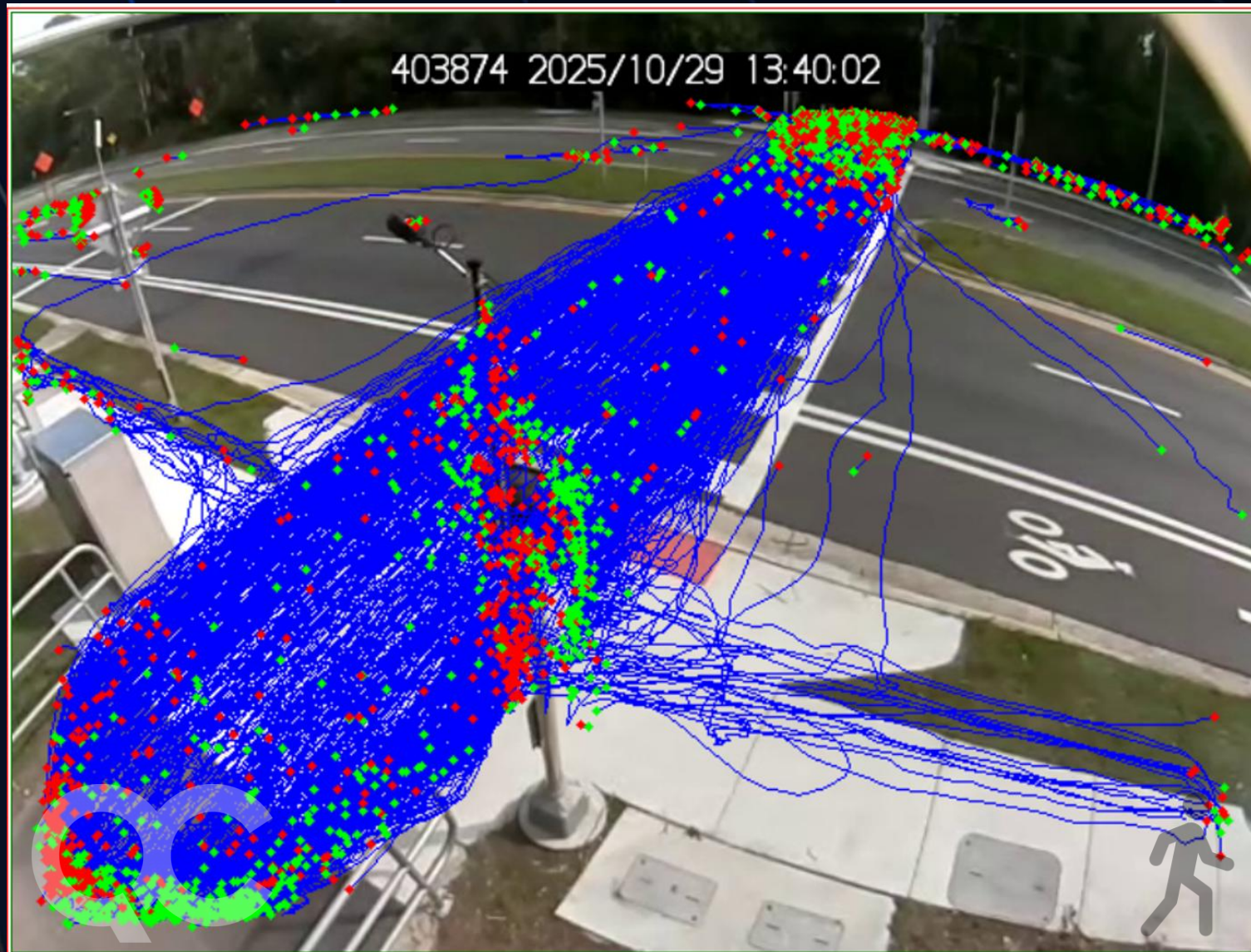
Data Collection & Processing



Data Collection & Processing



Data Collection & Processing



Data Collection & Processing



Quantifying Near-Miss Conflicts

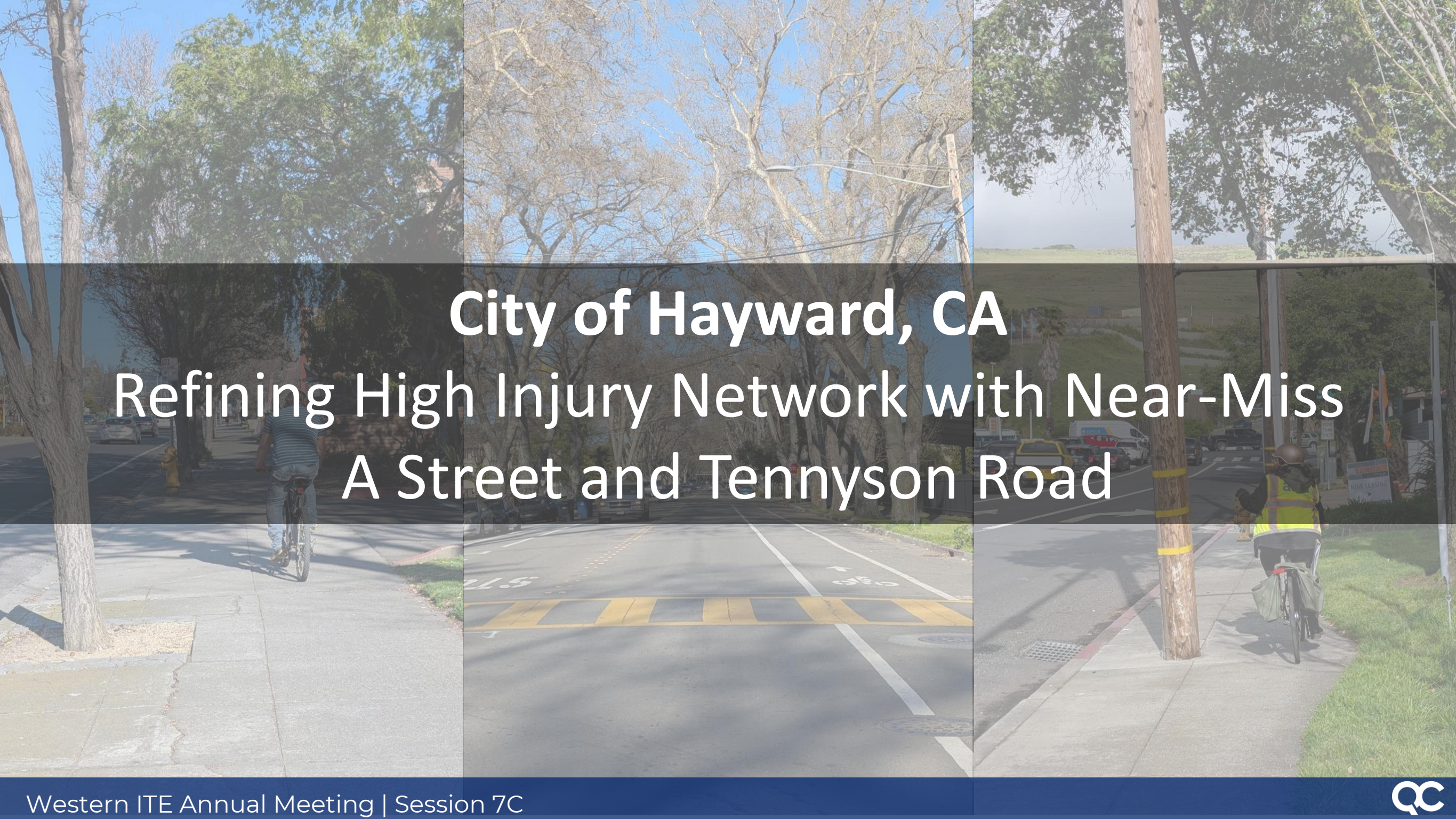
Post-Encroachment Time (PET)

Time difference of two road users occupying same space



Near-Miss at Scale

1. Collect video for traffic counts
2. Auto-calc PET for each interaction
3. Auto-flag conflicts where $PET < 3s$
4. Manually review each clip



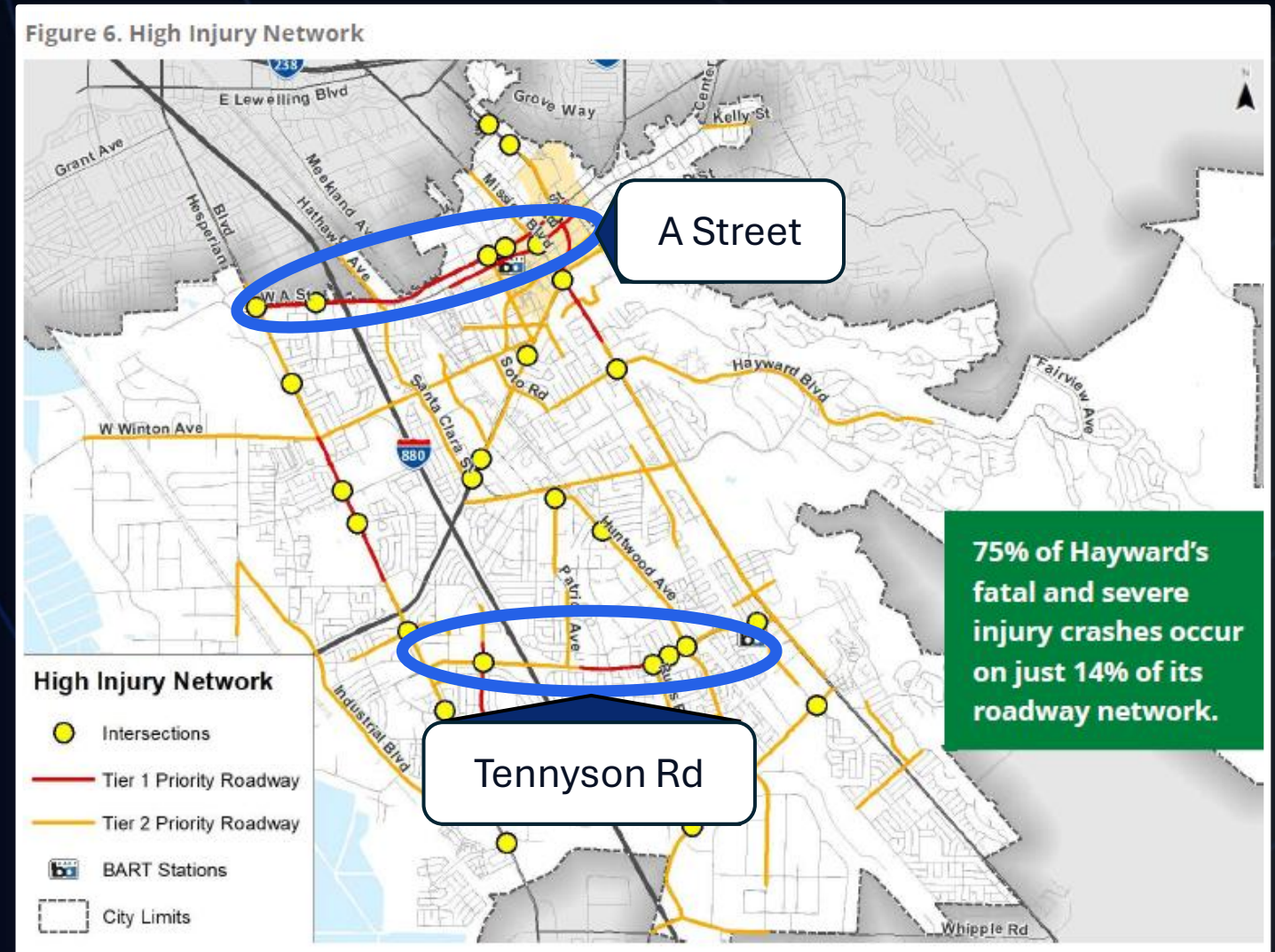
City of Hayward, CA

Refining High Injury Network with Near-Miss

A Street and Tennyson Road

City of Hayward | Beyond a High-Injury Network

- 2023 Local Road Safety Plan (LRSP)
- Tier 1 priority corridors:
 - A Street
 - Tennyson Road
- Safe Streets Hayward SS4A Grant



City of Hayward LRSP, 2023

City of Hayward | Advanced Safety Analytics

Data Collection

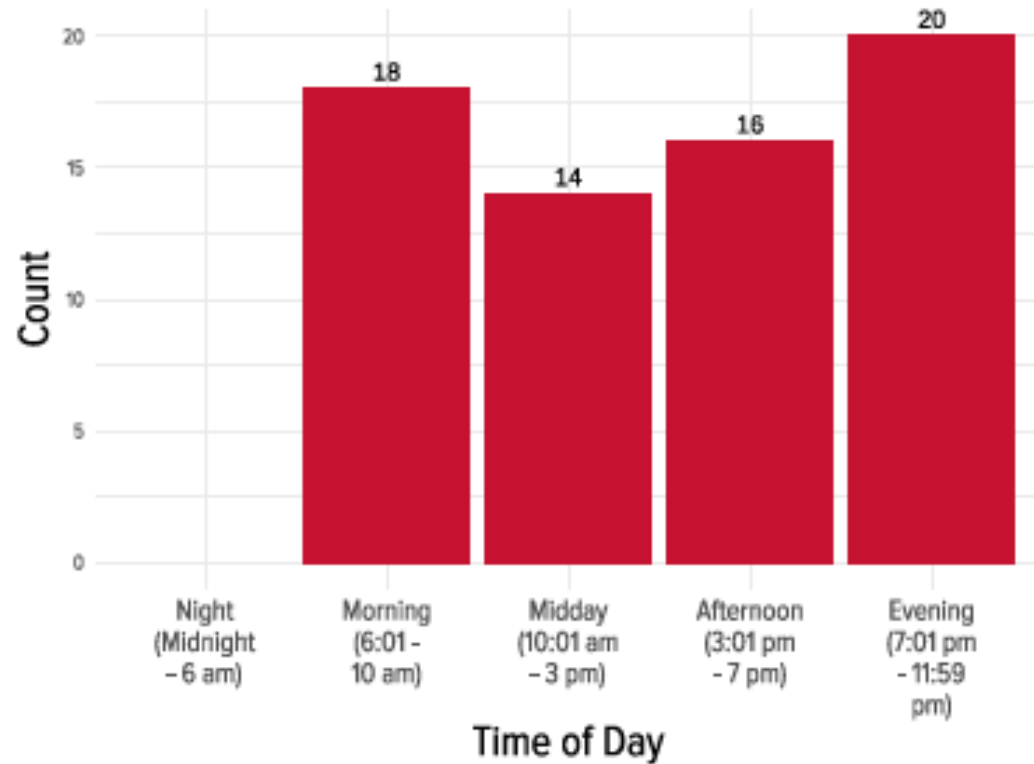
- 9 intersections along West A St & Tennyson Rd
- 1 weekday & 1 weekend day (48 hours)
- TMC + Near-miss
 - Red Light Running Events



City of Hayward | Advanced Safety Analytics

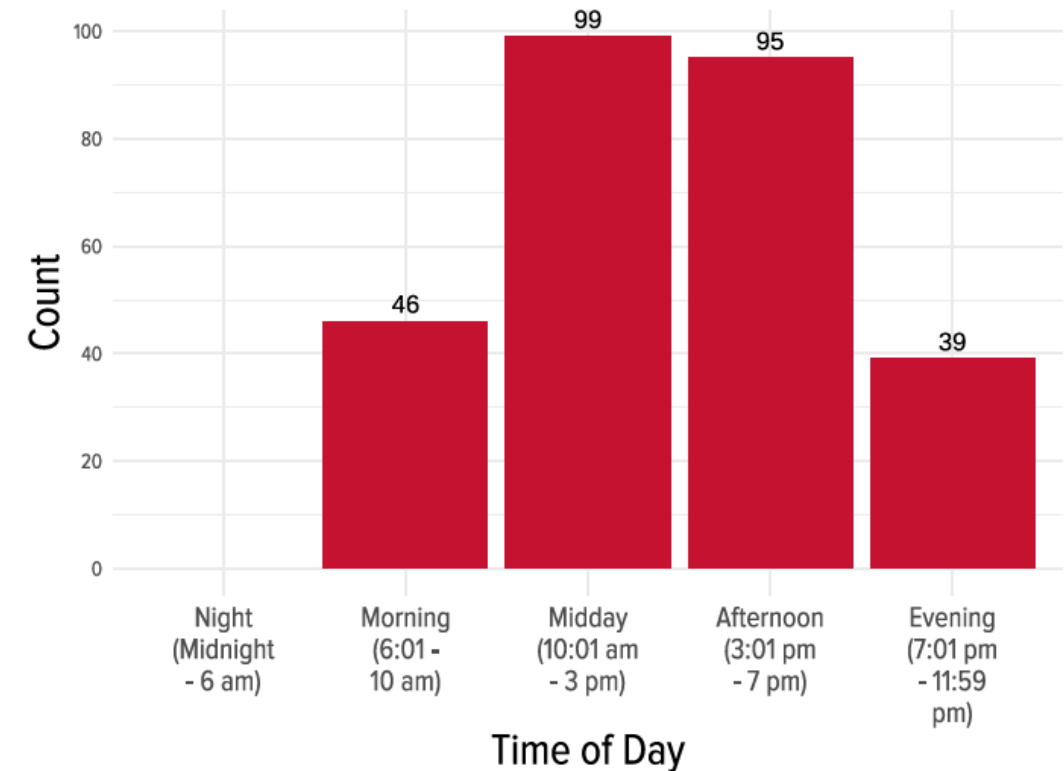
RED LIGHT RUNS (ALL DAYS)

By Time of Day



RED LIGHT RUNS (ALL DAYS)

By Time of Day



City of Hayward | Advanced Safety Analytics



An aerial photograph of a road intersection. A multi-lane road runs diagonally from the top-left to the bottom-right. It intersects with a smaller road that runs horizontally across the middle. The surrounding area includes green fields, some trees, and a few buildings. A semi-transparent dark blue rectangle is overlaid on the center of the image, containing white text.

Delaware DOT Hudson Rd & DE-1 Before/After Evaluation

Delaware DOT | The Before

- Divided highway with high speeds
- Two-way stop control
- Mostly PDO
- Repeated citizen complaints



Delaware DOT | The After

- Serious Injury Crash
- Restricted Lefts
(Delineators, paint, & signs)



Delaware DOT | Results

Average Daily Conflicts:

Before

After

287 per day



14.6 per day
95% Reduction

NBL vs EBT

231



5.8
97% Reduction

QC National Database
NBL vs EBT

100th



17th

Delaware DOT | After



What's Next for Near-Miss Safety?

GDOT/GATECH: Near-Miss BCRs

Correlate Near-Miss with Collisions

Near-Miss Kinetic Energy Model

Near-Miss Modification Factors

Key Takeaways



Counts → Interactions



Reactive → Proactive



Storytelling through Data

Thank You!



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