City of Albuquerque Automated Speed Enforcement (ASE) Program & Technology

Science, Technology & Telecommunications Committee

September 9, 2026

Jennifer Turner
Director
Department of Municipal Development
City of Albuquerque

Valerie Hermanson
Transportation Planning Manager
Department of Municipal Development
City of Albuquerque

Todd Jackson
Chief Technology Officer
Mesa Technologies

Scott Stewart
Sales Director
Elovate

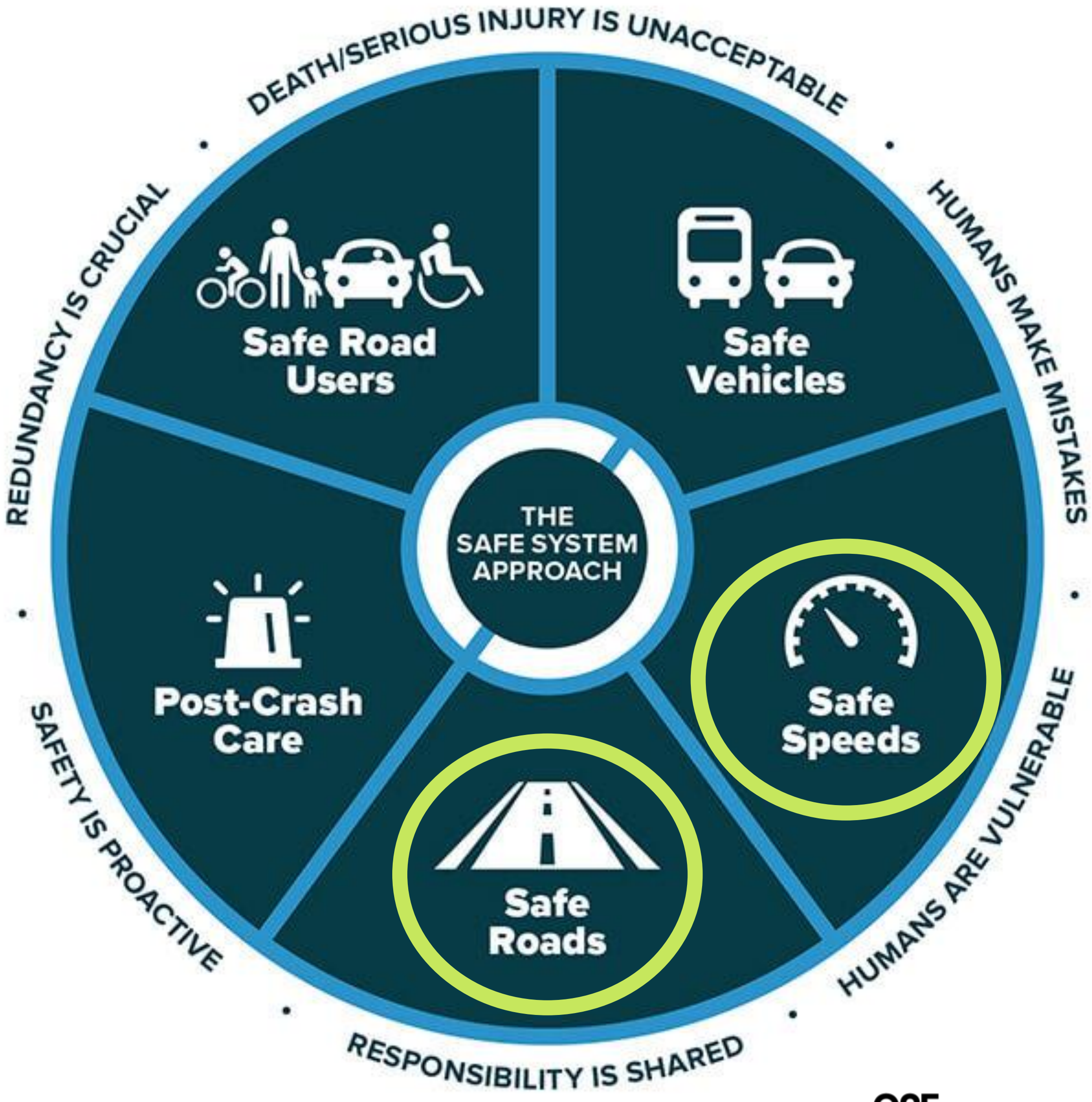
Kasim Dogruyol
Director, Program Management
Elovate

Gabriel Saenz
Program Manager
Elovate

ONE ALBUQUERQUE municipal development

We're working toward ZERO traffic deaths and serious injuries

The Safe System Approach aims to eliminate fatal and serious injuries for all road users. It's a road map to get to zero.



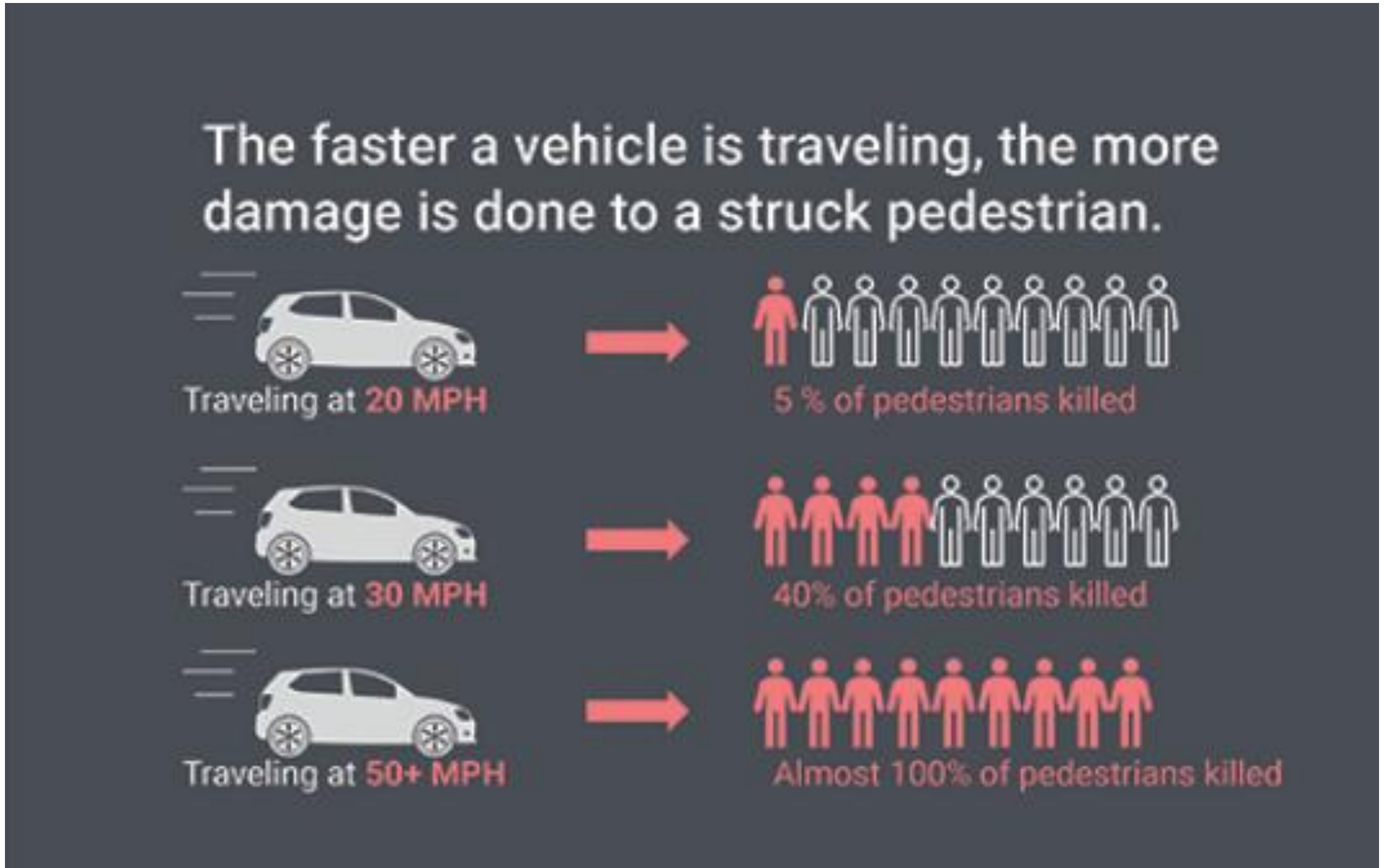
Source: FHWA.

ONE ALBUQUERQUE municipal development

Speeding is the leading cause of fatal crashes

- High-speed driving increases the frequency and severity of a crash

- Humans are less likely to survive high-speed crashes



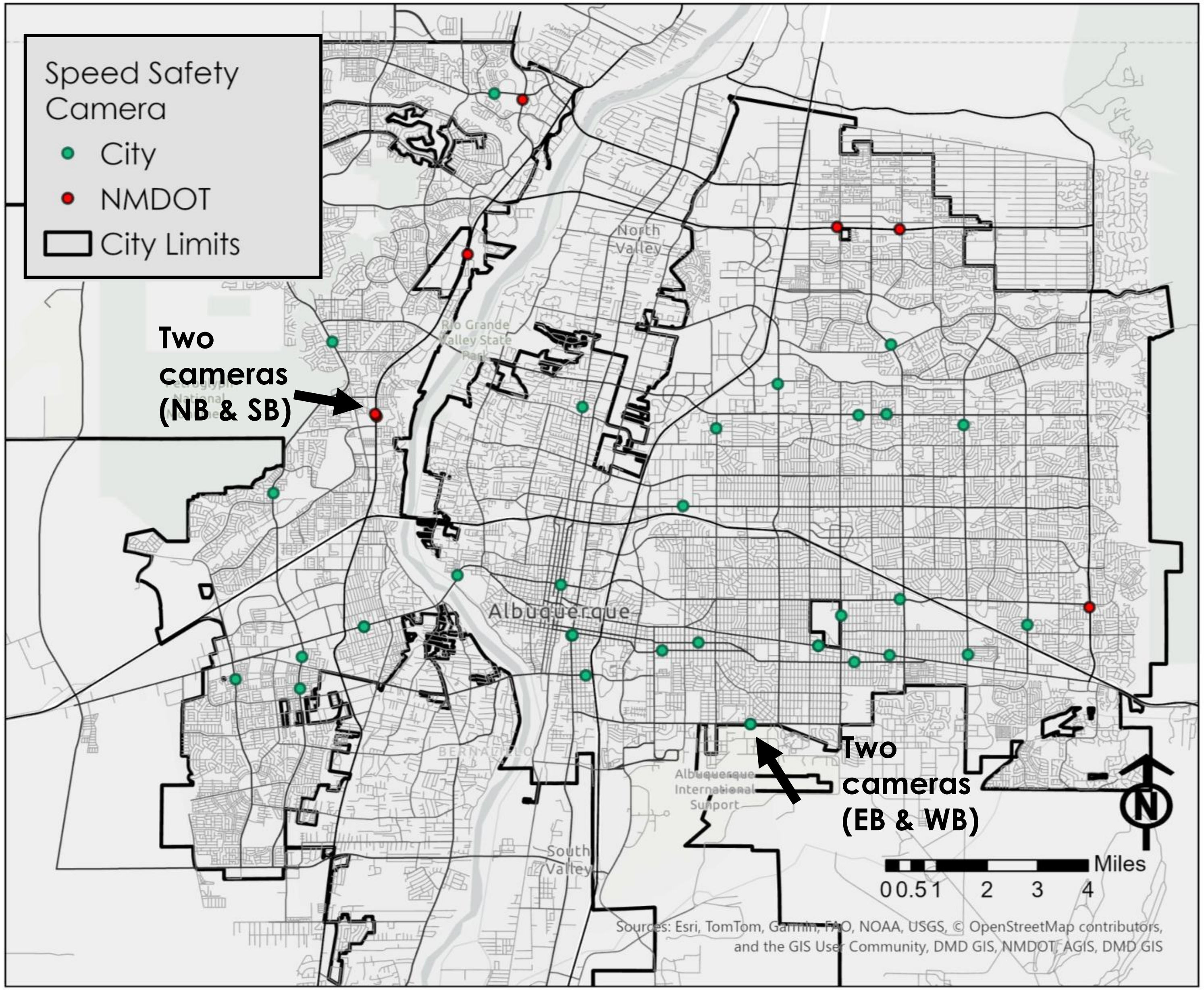
Source: City of Chicago

ONE ALBUQUERQUE municipal development

Camera Locations

- Located based on a data-driven approach
  - Speeding
  - Crashes
  - High Fatal and Injury Network
  - Vulnerability Index
  - Schools
  - Parks
  - Community centers

- City locations & locations on New Mexico Department of Transportation (NMDOT) roads



Speed safety cameras save lives

- **Changes in driver behavior:** first 20 cameras saw a **decrease in drivers exceeding the posted speed limit** by 10 miles per hour (MPH), with decreases ranging from **54.7% to 96.2%**

- First 20 cameras saw a **decrease in average driver speed,** with decreases ranging from **0.6 mph to 8.8 mph**

Data Dates: April 25, 2022 – June 2025

Reducing speeds even by one mph can result in a **17% decrease in fatal crashes***

*National Association of City Transportation Officials (NACTO). City Limits. American Association of State Highway and Transportation Officials (2010). Highway Safety Manual.

ONE ALBUQUERQUE municipal development

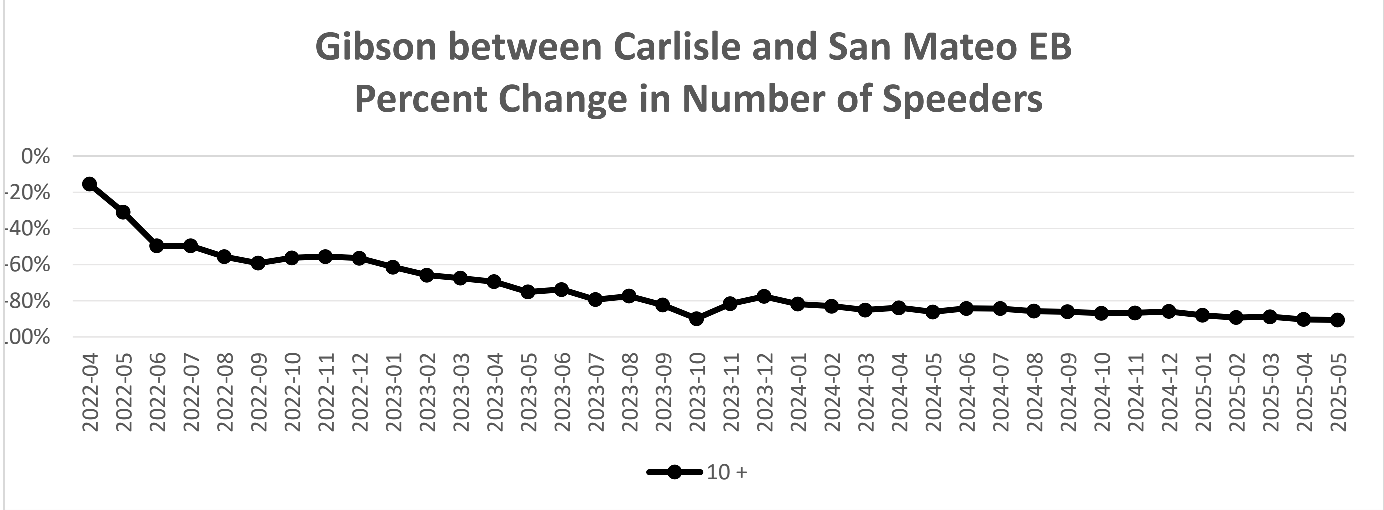
Additional program data

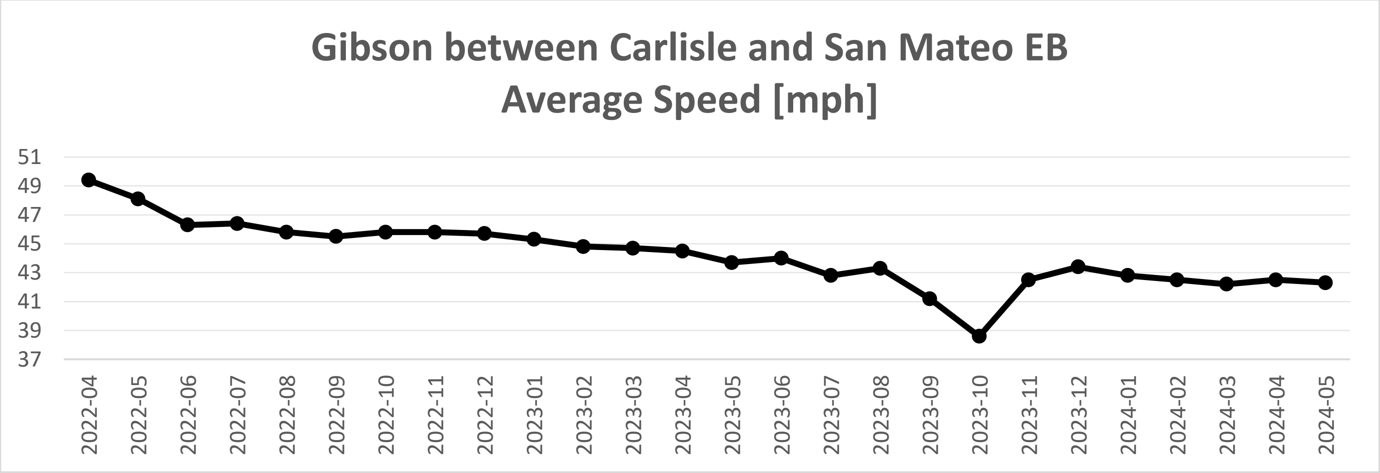
- Total citations issued: 845,409 (between May 25, 2022, and July 31, 2026)

- Vehicles with one (1) citation: 70.1%
- Vehicles with two (2) or more citations: 29.9%

Gibson between Carlisle and San Mateo Eastbound

- Posted speed: 40 mph
- Activation date: April 25, 2022
- Change in speeders: **-90.5%**
- Change in average speed: **-8.8 mph**
- Highest Speed: 150.5 mph
- Total violations issued: 73,578
  - April 25, 2025 – May 29, 2025: 35,061
  - New vendor August 15, 2025 – July 31, 2026: 38,517

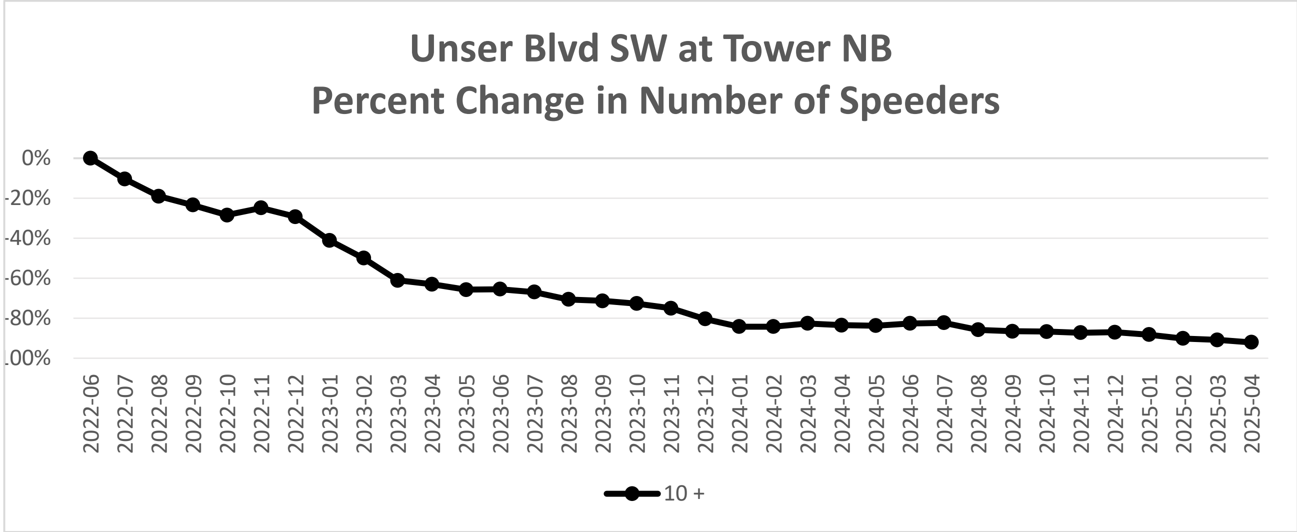


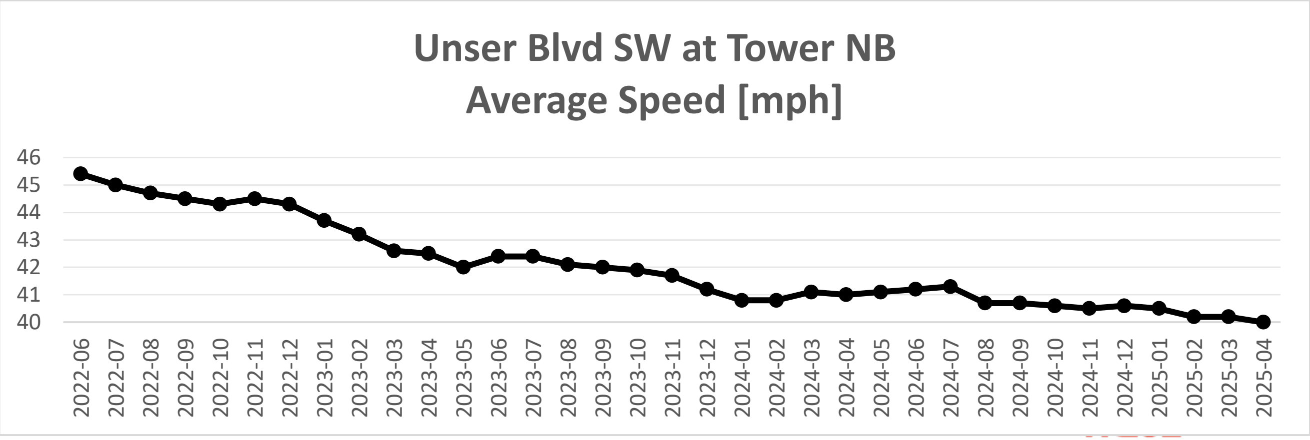


Data dates: April 1, 2022 – May 29, 2025

Unser Blvd NW at Tower Northbound

- Posted speed: 40 mph
- Activation date: June 13, 2022
- Change in speeders: **-92%**
- Change in average speed: **-5.4 mph**
- Highest Speed: 121.9 mph
- Total violations issued: 42,880
  - June 13, 2022 – April 24, 2025: 27,429
  - New vendor May 30, 2025 – July 31, 2026: 15,451

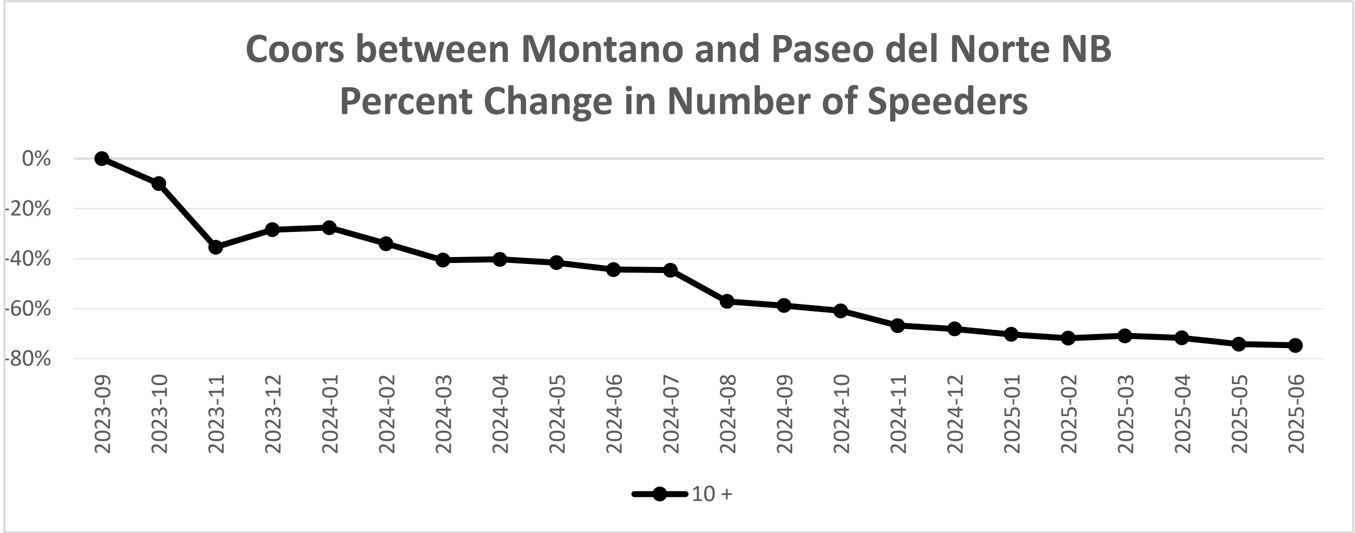


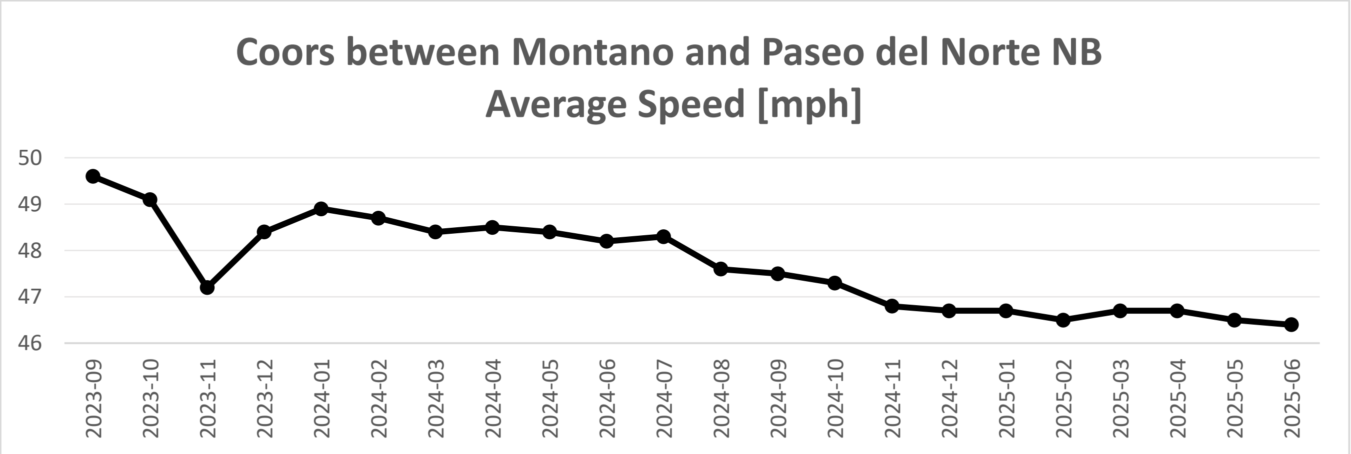


Data dates: June 13, 2022 – April 24, 2025

Coors (NM 45) between Montaño and Paseo del Norte Northbound

- Posted speed: 45 mph
- Activation date: September 15, 2023
- Change in speeders: **-74.7 %**
- Change in average speed: **-3.2 mph**
- Highest Speed: 163.1 mph
- Total violations issued: 67,831
  - September 15, 2023 – June 6, 2025: 16,522
  - New vendor August 4, 2025 – July 31, 2026: 51,309





Data dates: September 15, 2023 – June 6, 2025

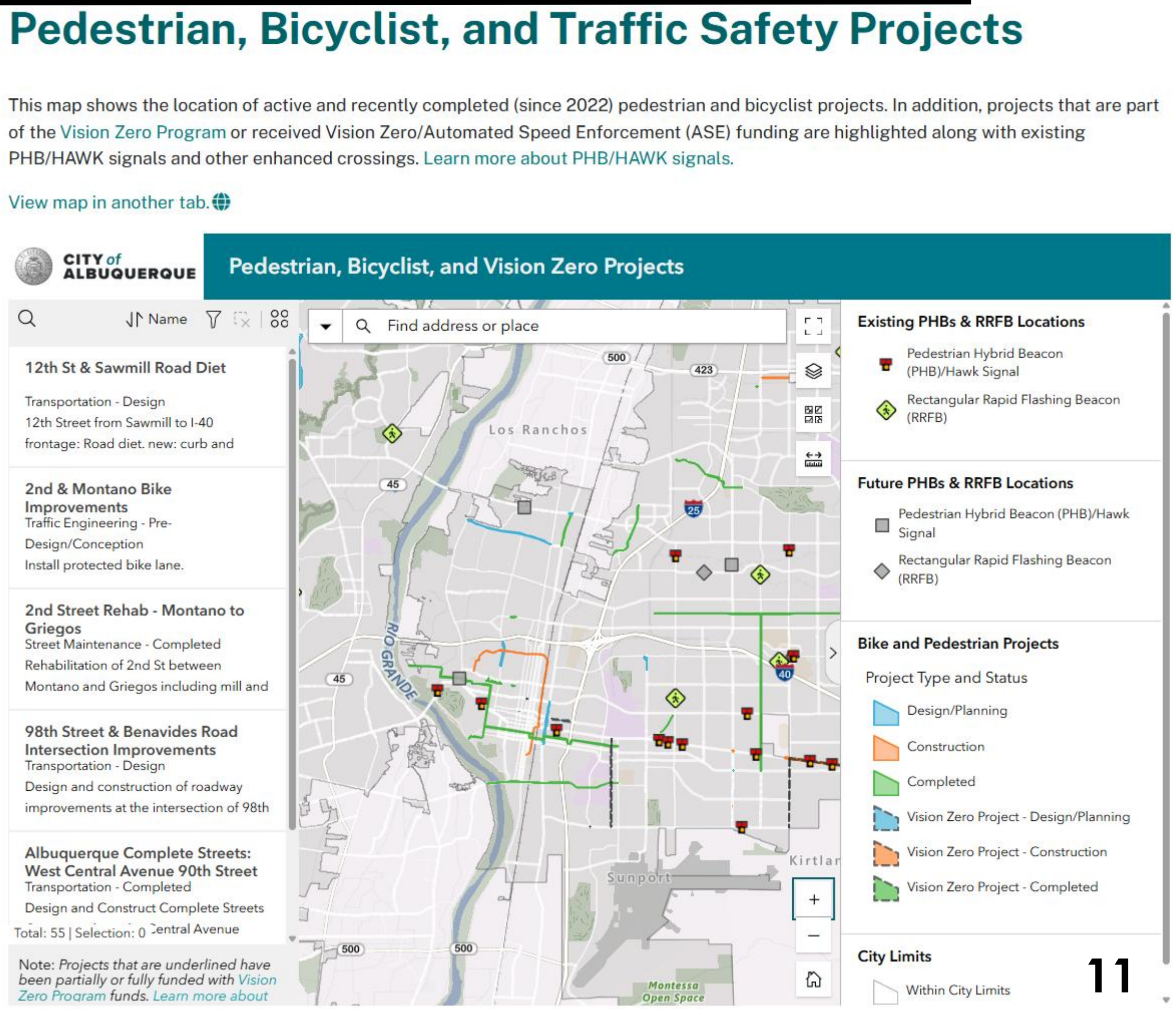
The ASE program and traffic safety projects are saving lives

- Funds generated through the City’s ASE program must be spent in accordance with strict State and City laws.
- The City first pays for program costs and makes payments to the State required by State law (NM Stat § 3-18-17 (2025).
- Per State law and the City’s ASE Ordinance, **remaining funds are used for traffic safety projects to create safer streets for everyone**.

The ASE program and traffic safety projects are saving lives

- ASE-Funded traffic safety projects are available to view on a public map: https://www.cabq.gov/safetyprojects

Example project: Business Access & Transit (BAT) Lanes & Mid-Block Crossings



SCIENCE, TECHNOLOGY & TELECOMMUNICATIONS COMMITTEE · SEPTEMBER 9, 2026

The Technology Behind Albuquerque's ASE Program

How radar, video analytics, and edge processing turn a speed detection into defensible evidence

Presented by Elovate, a Modaxo company

OUR ROLE

Powering Albuquerque's ASE Program

The City of Albuquerque decides where cameras go and owns the program's policy, data, and outcomes. Elovate supplies and operates the technology behind every detection.

01 Hardware & sensors

Radar-and-camera units installed at the high-risk sites the City identifies through its data-driven site selection process.

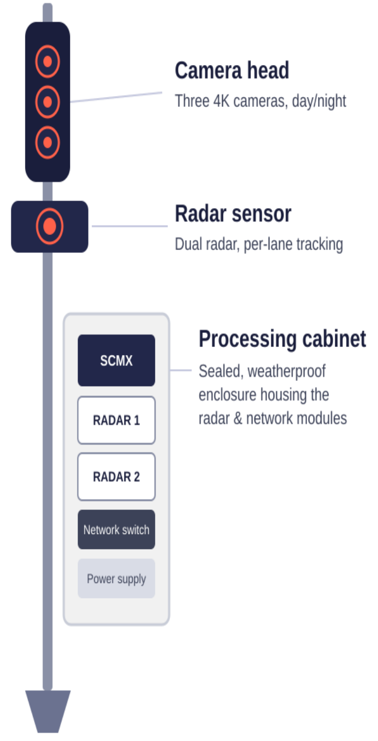
02 Evidence software

The DriveSafe software platform processes, stores, and manages every detection through to citation, with a full audit trail.

03 Field & technical support

Ongoing maintenance, uptime monitoring, and engineering support keep the system running day to day.

WHAT'S ON THE POLE



Illustrative diagram — not to scale

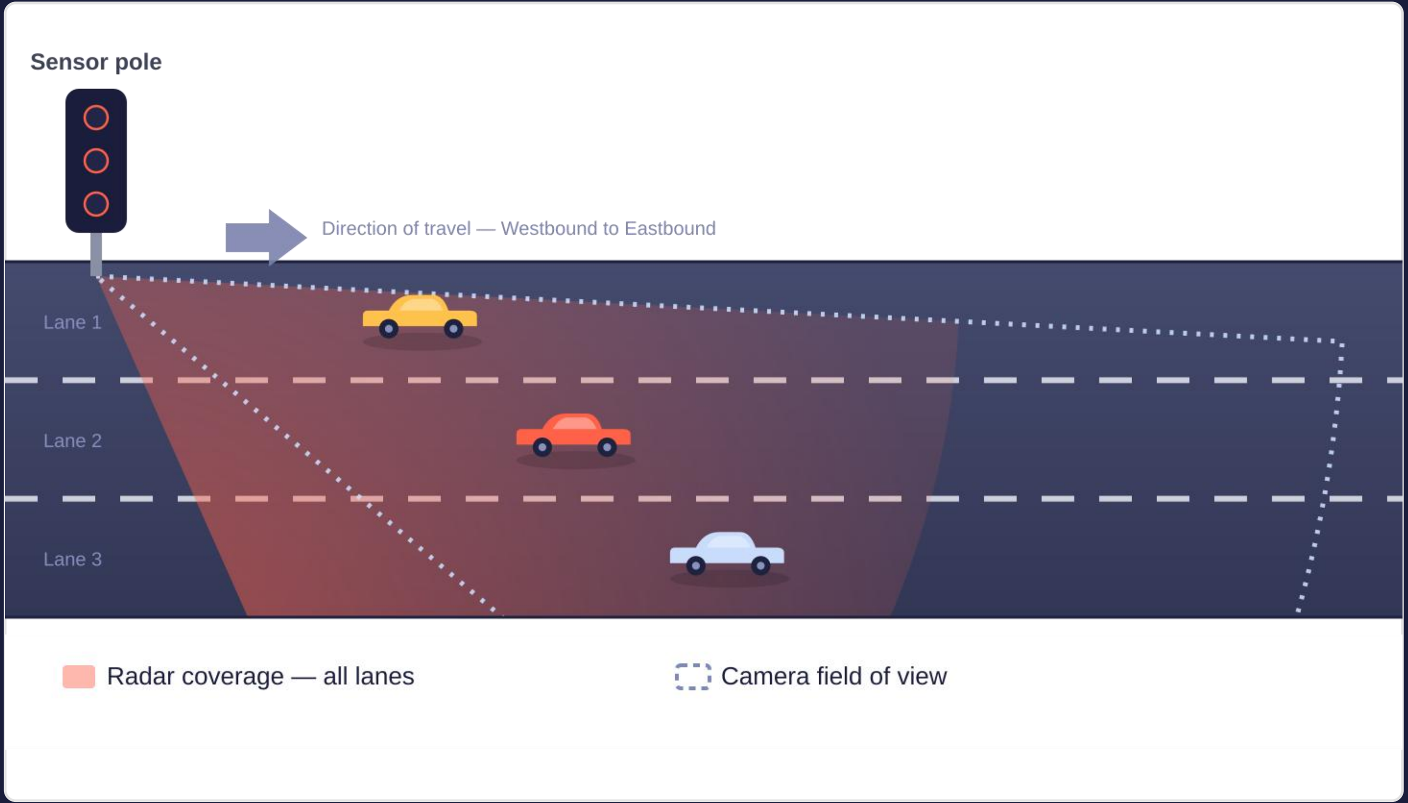
From Detection to Citation

Every citation follows the same path through radar, cameras, then a human check. The system is deliberately cautious: not every detection makes it all the way through.

1. Radar detects a vehicle's speed
2. Three HD cameras capture the scene
3. Software solution classifies & verifies the vehicle
4. Evidence package assembled
5. Human reviewer confirms the evidence
6. Validated citation issued

How the Detection Zone Is Covered

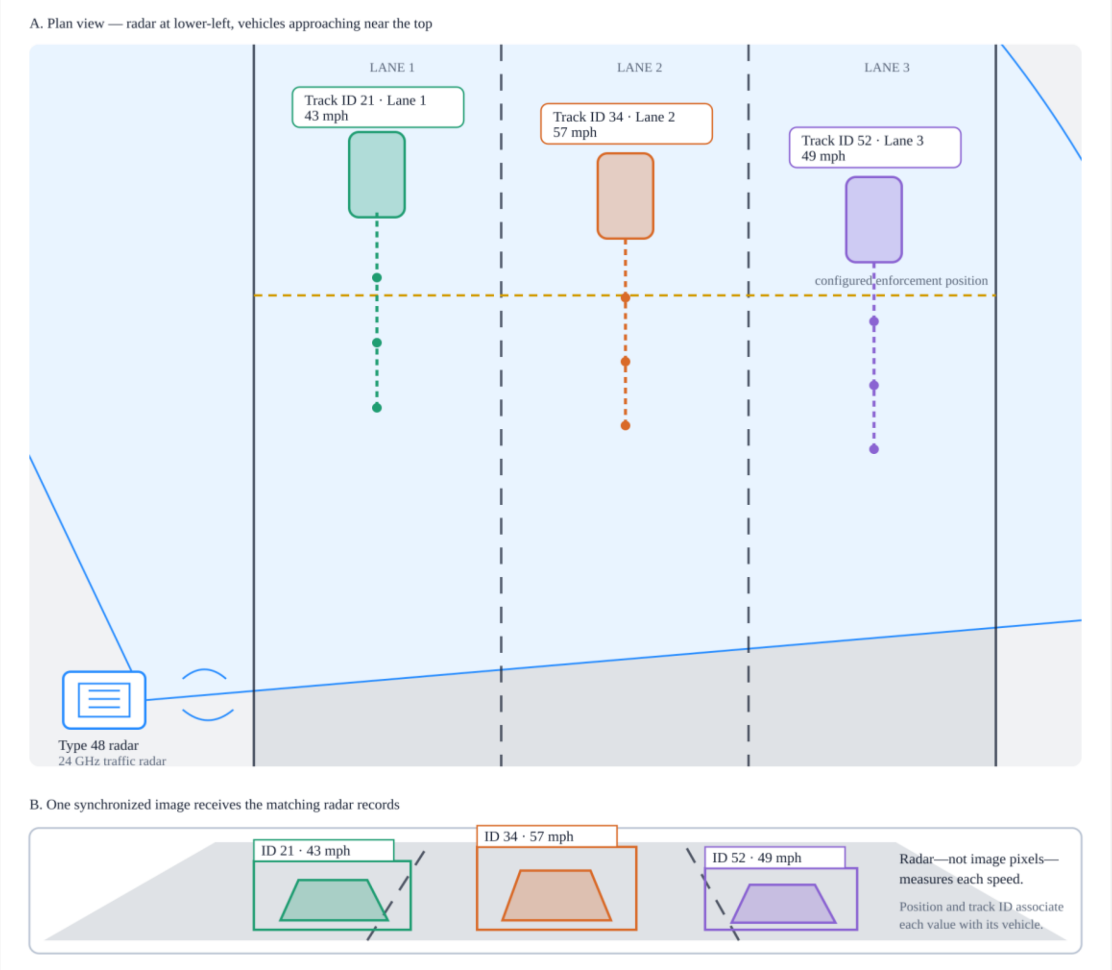
Step 1 of that pipeline starts here: radar covers every lane at once, and the camera head's field of view overlaps that same zone so each detection is tied to a specific vehicle in a specific lane.



Measuring Speed with Radio Waves

1. Type 48 radar transmits a 24 GHz FMCW signal across all three lanes.
2. Reflections are separated using range, Doppler (radial speed), and horizontal angle.
3. Tracking software links detections across radar cycles, giving each vehicle a persistent object ID.
4. Each object record carries X/Y position, absolute speed, heading, size, and ID.
5. Crossing a configured trigger position synchronizes that radar record with the camera exposure.
6. Calibration between the radar and camera converts the vehicle’s radar position into image coordinates, allowing the correct speed and track ID to be placed on the correct vehicle.
7. Multiple vehicles can appear in one image with separate tracking boxes; only the qualifying vehicle is flagged as the violation.

> *In short: radar determines the speed and identity of the violating vehicle.*



Real Smartmicro Type 48 radar output: each vehicle gets its own track ID, lane, and speed matched before a camera ever fires.

A Purpose-Built System, Not a Surveillance Network

The committee may have heard concerns about license-plate-reader cameras that log every passing vehicle into a searchable, cross-agency database. This program is built differently, by design.

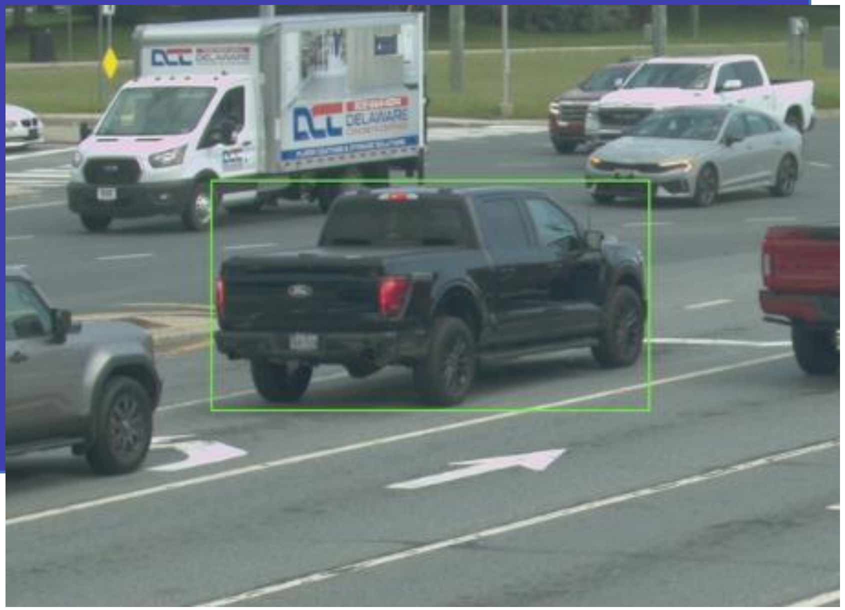
GENERAL-PURPOSE ALPR NETWORKS

- Logs every passing vehicle, violation or not
- Builds a searchable, historical database of vehicle movements
- Can be shared across agencies and jurisdictions, per public reporting
- General-purpose investigative tool, not tied to a specific violation

ELOVATE'S SPEED ENFORCEMENT CAMERAS

- Activates only when radar detects a speed violation
- Evidence is scoped to that one detection with no vehicle-history database
- Data stays inside Albuquerque's ASE program, governed by City contract and state law – never shared
- Single purpose: measuring and documenting a specific speed violation

Day or Night, Same Evidence Quality



Adjustable flash provides illumination while minimizing driver interference.

What an Evidence Package Looks Like

Every detection generates the same four artifacts, all created automatically and stamped with metadata a reviewer can verify.

Context Image 1

Context Image 2

Plate Close-Up

Video Clip

LOCATION	SPEED READING	POSTED LIMIT	TIMESTAMP
Corridor & direction	Radar-measured speed	Signed speed limit	Date & time, to the ms

All fields are recorded in metadata as part of the evidence pack, alongside the image and video files.

Context and plate images are real captures with the plate and burned-in event data redacted for this briefing.

PROVEN TODAY · FIXED CORRIDORS

Fixed Corridors: Already Proven in Albuquerque

The system running today at Albuquerque's fixed sites

01 **Radar + video analytics, permanently pole-mounted**

Dual radar sensors, three 4K cameras, edge solution installed at fixed locations.

02 **All-weather, lower cost, proven at scale**

Radar's continuous-wave physics and a decade-plus field history make it the right fit for permanent, long-term installations.

03 **Suited to long-term, high-fatal-and-injury corridors**

Matched to the corridors APD's own data identifies as highest-risk and not a one-size-fits-all deployment.

04 **In service today at Albuquerque's fixed sites**

Live, operating, and generating the evidence this program runs on.

Work Zones: A Solution We Already Run

The same proven approach extends to work zones programs. Elovate already operates state-wide work-zone speed enforcement programs for 6 states today.

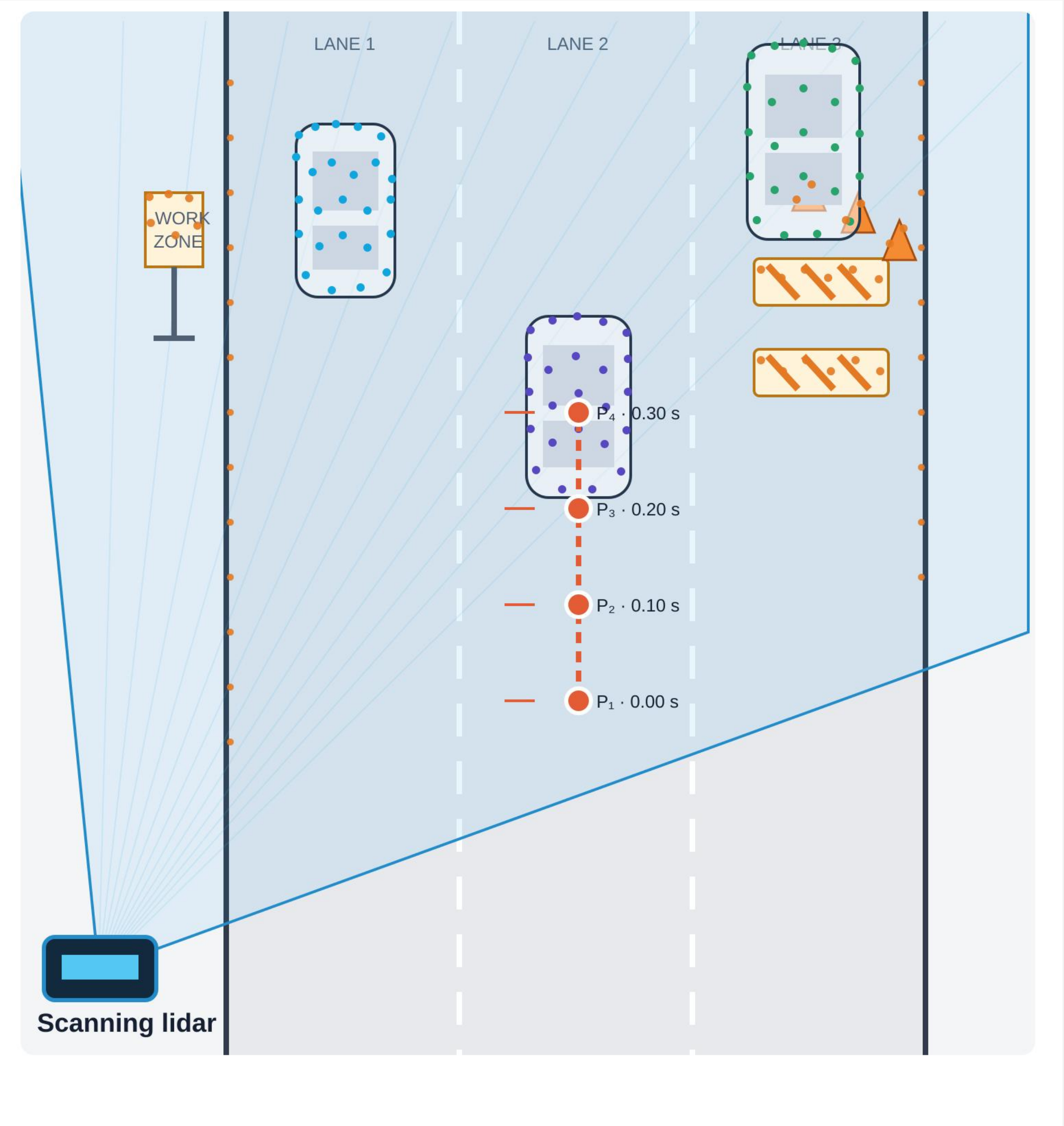
- Currently operating in multiple states today. Proven, multi-year track record, not a first deployment
- LiDAR sensor gives a detailed 3-D read of each vehicle in tight, fast-changing work-zone traffic
- Portable units that move with the site, protecting road crews
- Solar powered trailer platform for extended, unattended deployment

Work-zone speed trailer - solar power, elevated sensor mast, standard work-zone signage.

Measuring Speed with Light Pulses

1. Each lidar scan measures the vehicle's precise 3-D position in the roadway.
2. Enforcement software associates those points with one persistent vehicle track.
3. Every tracked position carries a precise timestamp.
4. Speed is calculated directly from distance traveled over elapsed time, speed = distance ÷ time.
5. The same point cloud separates real vehicles from cones, barriers, signs, and roadway edges.
6. That resolution matters most in work zones where equipment and barriers can create radar multipath, lidar's 3-D points help hold the correct track.
7. Performance still depends on visibility, mounting, and calibration.

> *In short: speed comes directly from the lidar's own 3-D position data over time.*



Scanning lidar tracking a vehicle across four timestamped positions in a work zone.

Appendix

Reference material for more technical depth on site selection, radar hardware, sensor physics, or the review workflow.

Event Capture through Initial Violation Issuance

1 QC Review
Camera & capture check

2 Initial Review
Read plate + state, plate / face image crop, image selection
Approx. 80 events reviewed per hr.

3 VR Lookup
Registered-owner lookup

4 Verify Review
Vehicle + RO information available. Double-blind check
Approx. 90 events reviewed per hr.

5 Client Review
Vehicle + RO information available. Issue / reject decision

6 Issuance
Citation Number & Fine assigned

7 Notice & Mailing
Generate PDF + Transfer to print vendor

Human-in-the-loop (1-5)

A trained reviewer touches every event at multiple stages.

Independent double-blind (4)

Verify reviewers differ from initial reviewers.

Multi-source owner lookup (3)

Data applied to the event, then re-verified.

Eyes on the Road

With speed established, the second sensor takes over. Each unit runs three high-resolution cameras and an onboard processor that classifies vehicles, reads plates, and builds the evidence package in real time.

Three 4K cameras

Each unit shoots high-resolution video around the clock, covering the full approach to the detection zone.

Edge processing

An edge processor identifies vehicle type and reads the license plate at the moment of detection.

Evidence package

Two context images, a close-up plate image, and a short video clip — each stamped with date, time, location, and speed.

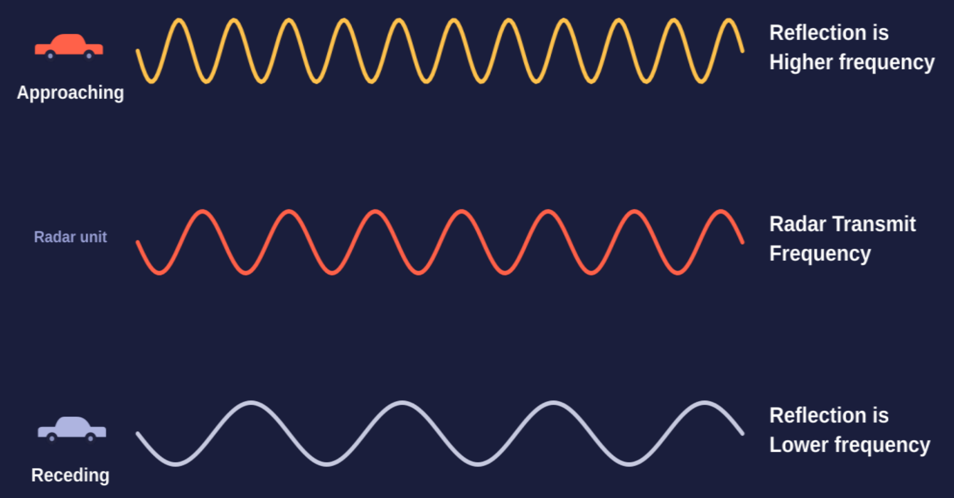
Automated quality control

Weak or unclear reads are flagged automatically and filtered out before a person ever reviews the case.

Measuring Speed with Radio Waves

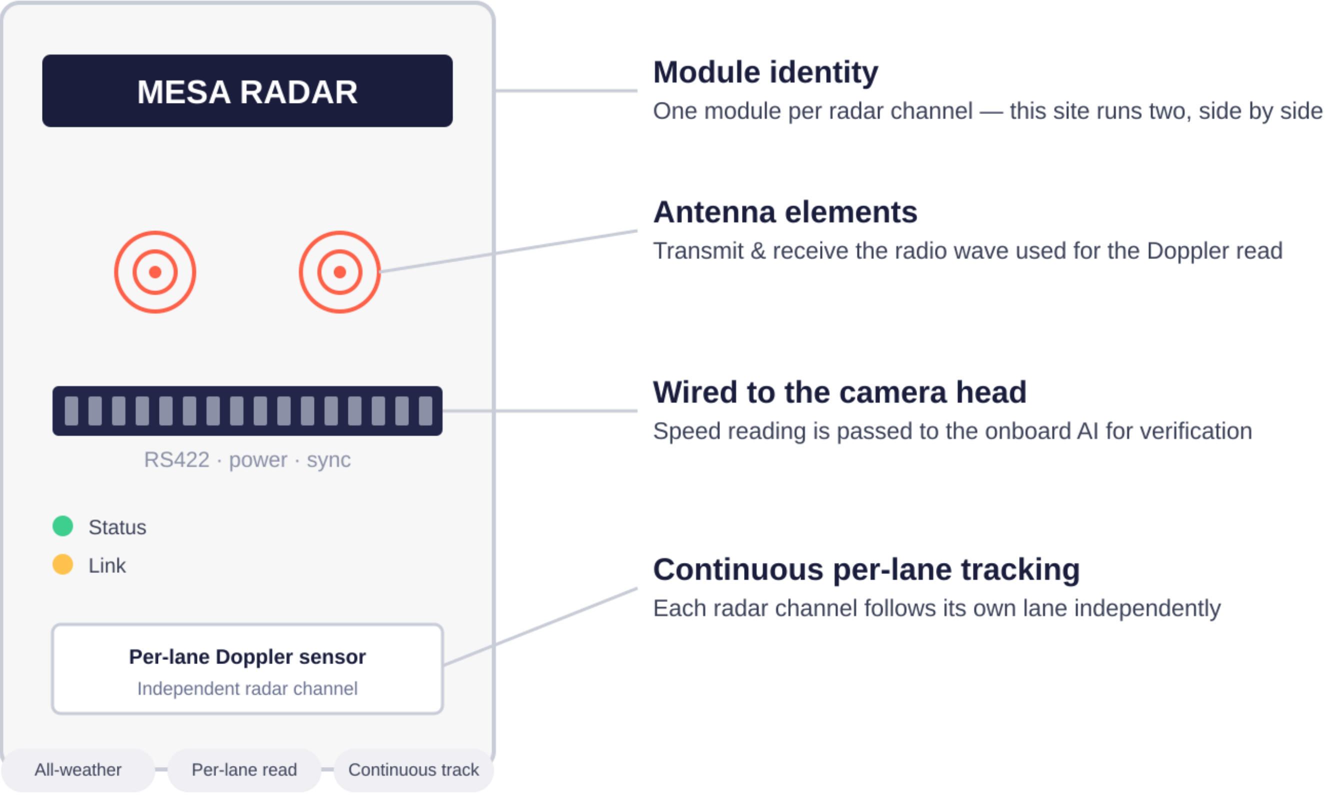
- Radar sends out a continuous radio wave and listens for its reflection off a moving vehicle.
- A vehicle moving toward the unit compresses that reflected wave; a vehicle moving away stretches it similar concept as changing pitch of a passing siren.
- Each unit runs dual radar sensors that monitor every lane and track vehicles independently, converting the frequency shift directly into a precise speed reading.

> *The pitch of the wave rises as a car approaches and falls as it moves away; radar reads that change as speed.*



Speed is read from the size of this shift — not from a single snapshot in time.

Inside the Radar Module



Illustrative — based on the radar modules installed at Albuquerque's fixed sites

Albuquerque's fixed sites run Mesa radar modules two per unit, one per direction of travel feeding speed readings to the onboard processor for verification.

Radar vs. LiDAR: Two Ways to Measure a Vehicle

The physics behind the work-zone technology pairing: why the sensor choice changes with the environment.

RADAR

Continuous radio wave · Doppler shift

Best for:
Open roads, long range, all-weather,
continuous per-lane tracking

LiDAR

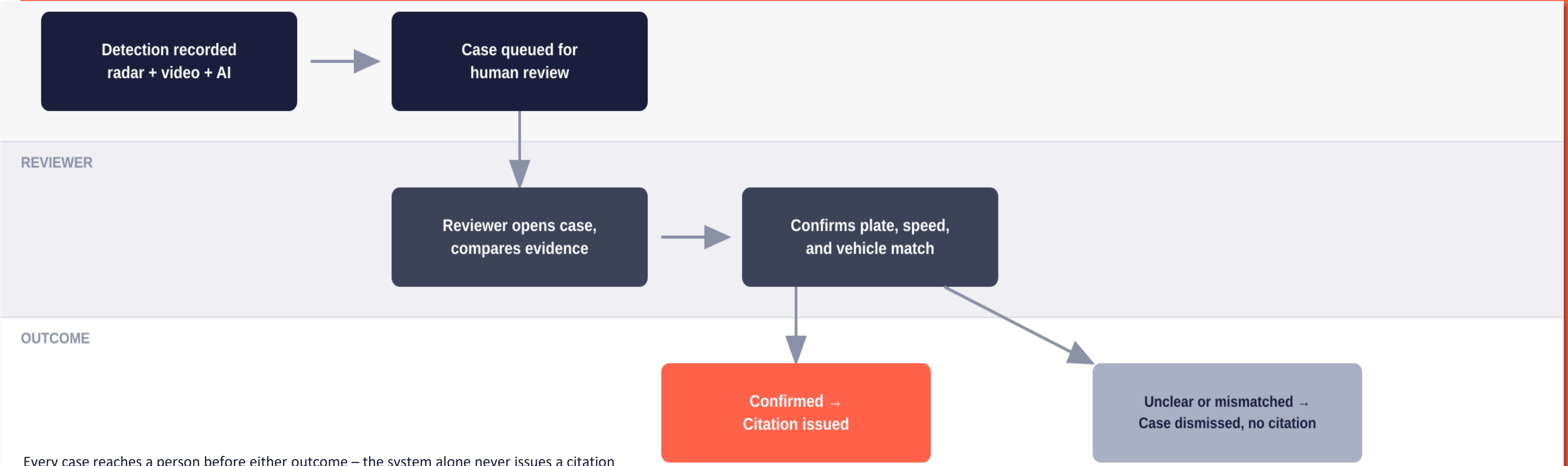
Pulsed light · time-of-flight distance

Best for:
Work zones, short range, high detail,
portable / temporary deployments

Two different physics — same goal: an accurate, defensible speed reading matched to the environment

How a Case Moves Through Review

The funnel slide, unpacked: this is the exact path a case takes through the CW5 platform, from detection to a person's final decision.



Every case reaches a person before either outcome – the system alone never issues a citation

Unredacted

HOW IT WORKS · EVIDENCE

What an Evidence Package Looks Like

Every detection produces the same four artifacts, all generated automatically and stamped with metadata a reviewer can verify.

LOCATION	SPEED READING	POSTED LIMIT	TIMESTAMP
Corridor & direction	Radar-measured speed	Signed speed limit	Date & time, to the ms

Unredacted

HOW IT WORKS · LOW-LIGHT PERFORMANCE

Day or Night, Same Evidence Quality

Infrared illumination keeps the vehicle and plate readable without a visible flash.