

Western Commercial Vehicle Safety Summit

WIM Enhancement Technology

December 4, 2024



QUARTERHILL
FURTHER. FASTER. **SMARTER.**

INTRODUCTION

About Quarterhill

Safety and Enforcement



Tolling



QUARTERHILL

Safer, greener, trusted transportation



AI Data Collection



Truck Compliance & Safety



Toll Systems



Logistics



Smart Cities & Smart Infrastructure



Bridge Monitoring & Safety



Traffic Monitoring & Data Services



Service & Maintenance



Traffic Products



Building on the VWS Concept

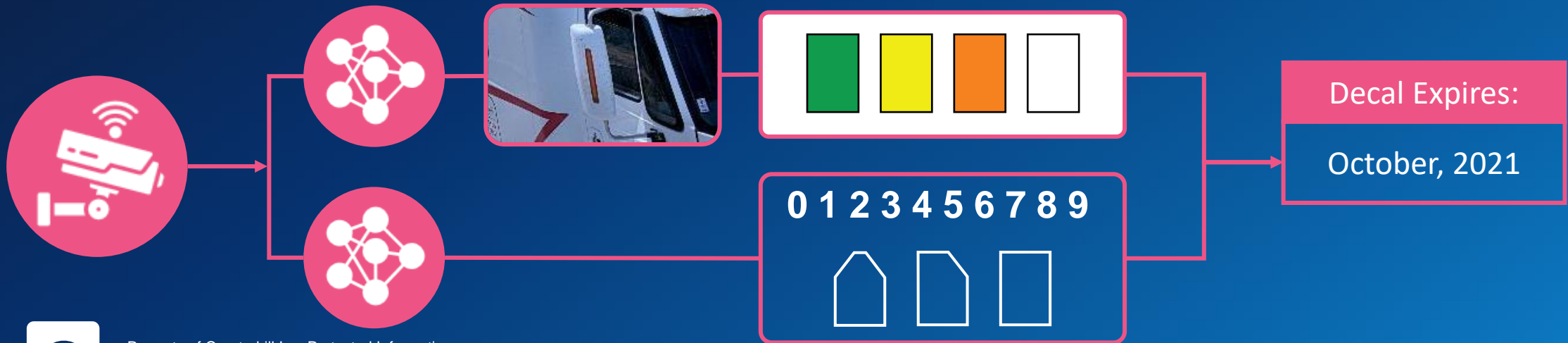
- Advanced Screening Technologies



AI-enabled Visual Inspection for CVE

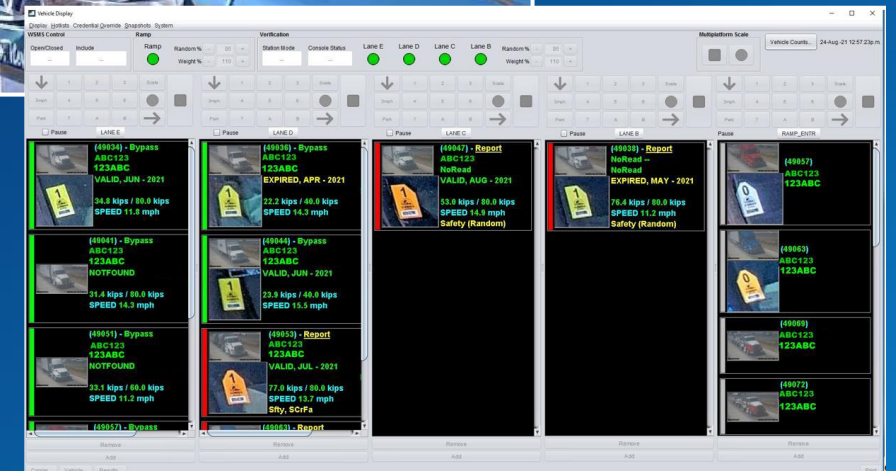
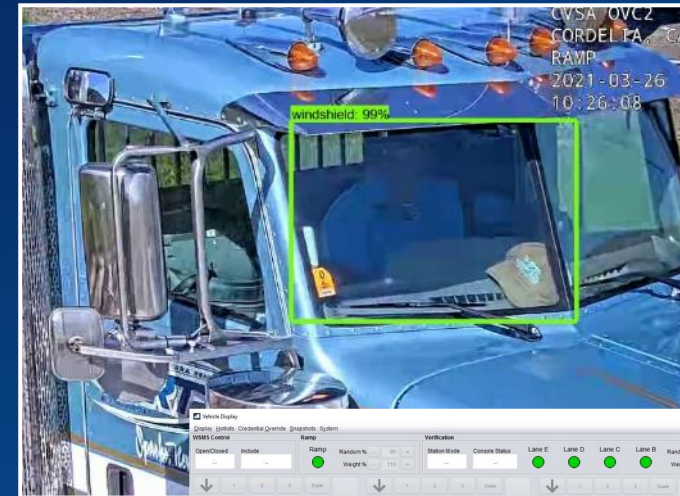


CVSA Decal Reader System



AI Based Decal Reader – Cordelia, CA

- A CVSA decal is an indicator that the vehicle has been determined to be in safe condition by a CVSA inspector.
- Automatically checking for expired decals has value for commercial vehicle enforcement agencies as they can select vehicles for inspection that have not received recent inspections.



AI POWERED DATA SYSTEM

iTHEIA™ AI Video-Based Traffic Classification System

Artificial Intelligence (AI) powered traffic data system is the first to meet state-level data reporting requirements.

The screenshot displays a traffic camera feed of a multi-lane highway. A large white semi-truck with a trailer loaded with orange construction materials is the primary focus. The interface includes a 'Vehicle Details' window with the following data:

Vehicle #	Lane	Class	Speed (mph)	Timestamp
14904055	Lane 2 (#2)	FHWA9	79	May 3, 2024 12:28:47 PM

DOT evaluations on a high-traffic, four lane road have shown **>98% accuracy** for counting & classification standard FHWA 13-class schemes



Vehicle configurations and cargo

AI can be trained to recognize specific vehicle configurations and cargo (ex. Boat & Trailer)



Driver Compliance Camera

- Identifies whether drivers are following crucial safety protocols like seatbelt and hands-free laws
- Capable of observing driver behavior, cell phone, and seat belt usage for enforcement



HAZMAT Placard Reader

- HAZMAT Placard Reader to identify vehicles with dangerous goods
- Identification of placards to target specific vehicles

Applications:

- Identification of Commercial Vehicles using non-HazMat Routes
- Screening of approved HazMat Carriers



Overheight & Over Dimension



Red/Infrared Beam Overheight Detection



LiDAR Sensor Vehicle Dimensioning



TACS™

Tire Anomaly and Classification System

- Detection and classification of tire anomalies on commercial vehicles
- Anomalies can be classified as Dangerous or Suspect
- Tires can also be identified as Inefficient
- May be deployed as an enforcement or information system



VectorSense Technology

- Tire footprint sensor technology detects tire width with high accuracy
- Thin slices of the tire contact are measured thousands of times per second
- Measurements create a contact pressure profile for the tire width and location for each tire on a vehicle



Tire Issues and General Maintenance Correlation

Case study: Cordelia Weigh Station - California

Agencies: California Highway Patrol (CHP), Caltrans, County of Solano

- The first six months of TACS saw a **30% increase in tire violations** over the previous five-year average
- Data was captured for vehicles pulled in and inspected based on tire screening, a significant number had other out-of-service safety violations such as brakes or other mechanical issues
- Vehicles identified with a tire anomaly were placed out-of-service **75%** of the time
- **46%** of vehicles with an identified tire issue had an out-of-service brake issue



Tire Width-based Compliance

- Screening against standards that allow wider tires to carry heavier weights
- Trucks with wide-base tires can carry as much as 8000 lbs (3600 kg) more on the steering axle

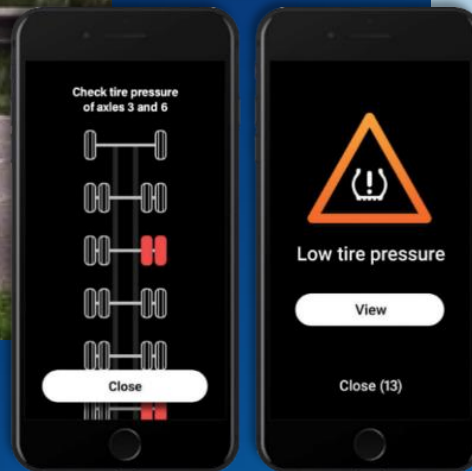
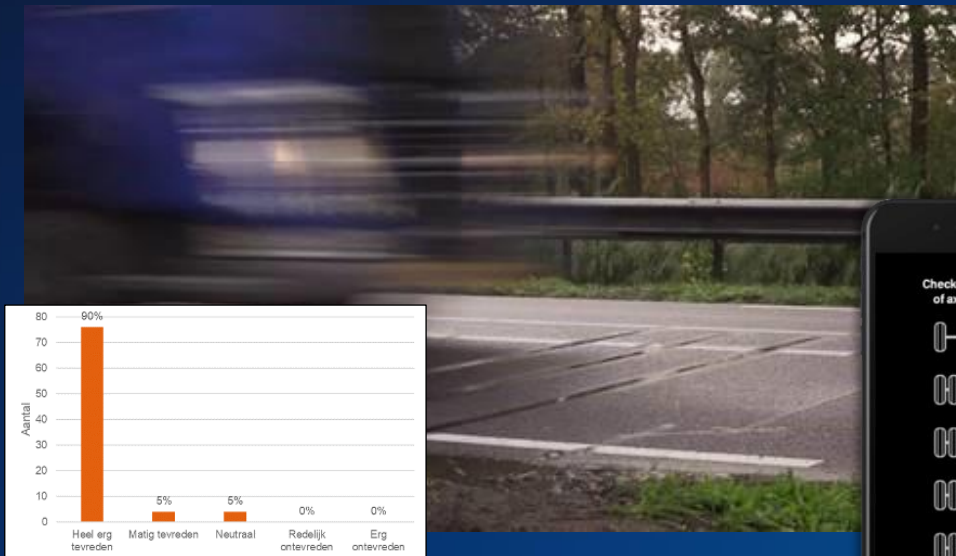


6% of all commercial vehicles met the criteria for bypass based on tire width.



Driver Information System

- Feedback from transport companies in the Netherlands was positive, with nearly all stating they believed the program had benefits
- **72%** of participating companies received tire anomaly alerts during the trial period. **95%** were satisfied with the program and only **5%** were neutral.

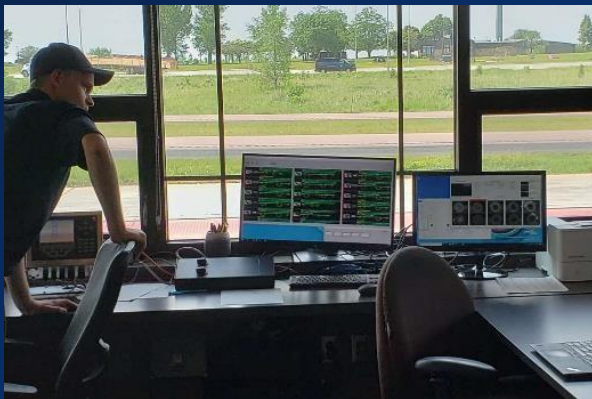


Integrated Inspection Station

Case study: **South Dakota CVO, Tire and Brake Safety Screening**

Agencies: South Dakota Department of Transportation, South Dakota Highway Patrol

- Electronic credential/safety screening with transponders and iROC®
- Smart Infrared Inspection System (SIRIS™) uses thermal camera technology to detect anomalies in brakes and tires.
- Tire Anomaly and Classification System (TACS) checks for tire anomalies, such as flat, missing or underinflated tires.



CONCLUSION

Thank you

Questions?

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