

Real-world performance of the TrafSense road monitoring system

Selected highlights from presentation at the
ITS European Congress, Seville, May 19–21,
2025



**EUROPEAN
CONGRESS**
SEVILLE
19–21 May 2025
Clean, resilient and
connected mobility.





TrafSense: Capabilities and real- world performance

Distributed sensing vs point sensors

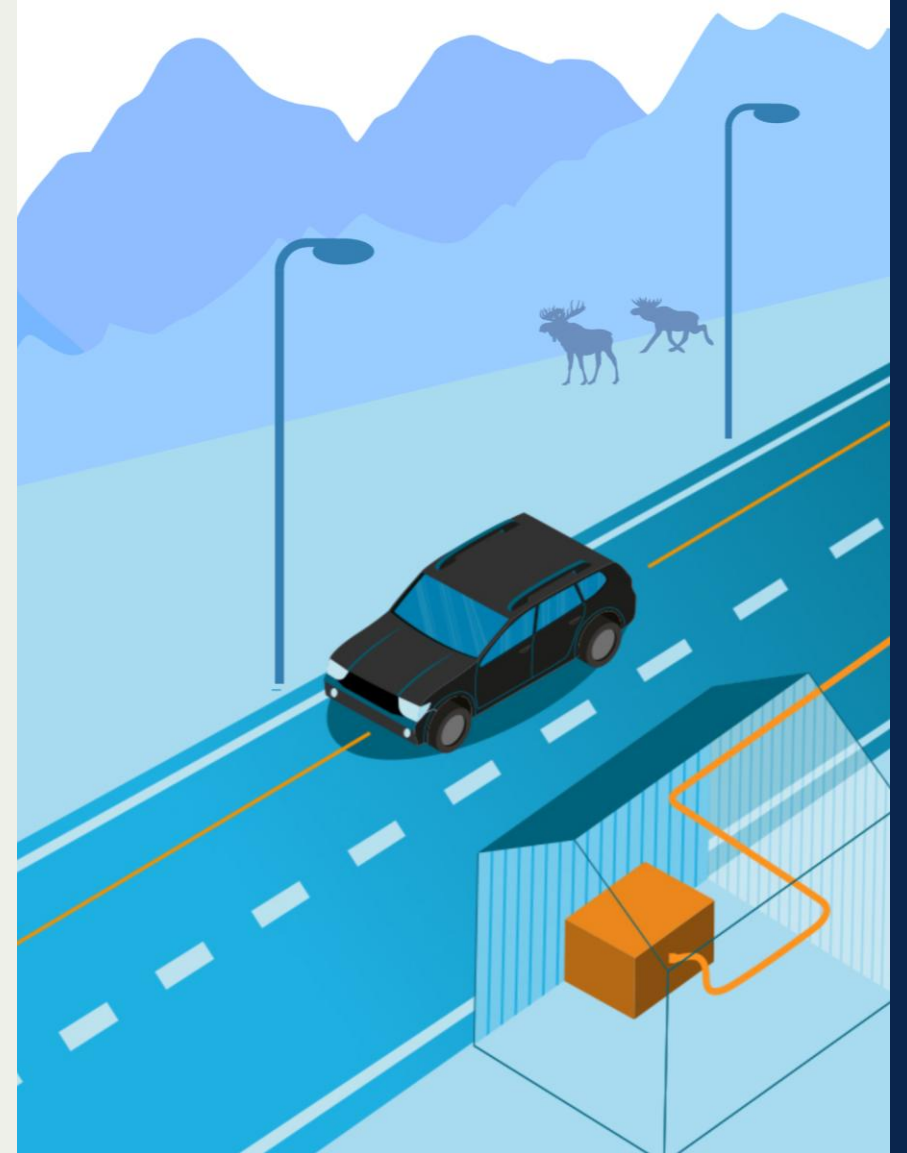
Automatic Incident Detection (AID)

Accuracy of AID and its added value

Queue detection

Vehicle tracking

Traffic flow analysis



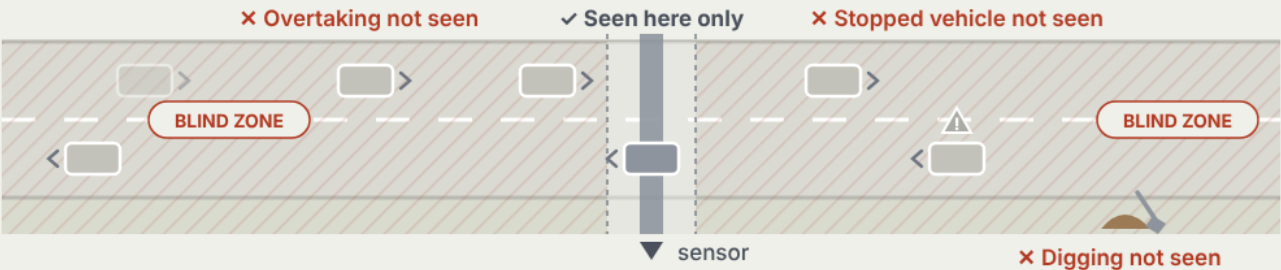


Distributed sensing – more intelligent than point sensors



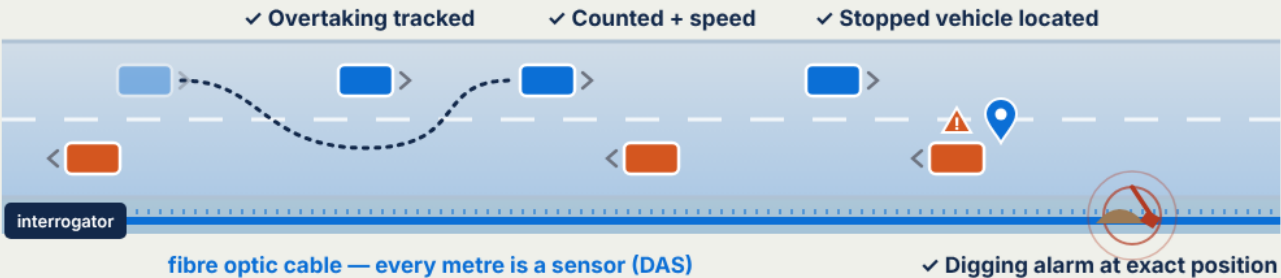
Single-point sensor

Sees each vehicle for an instant, at one spot. **Everything between sensors is a blind zone.**

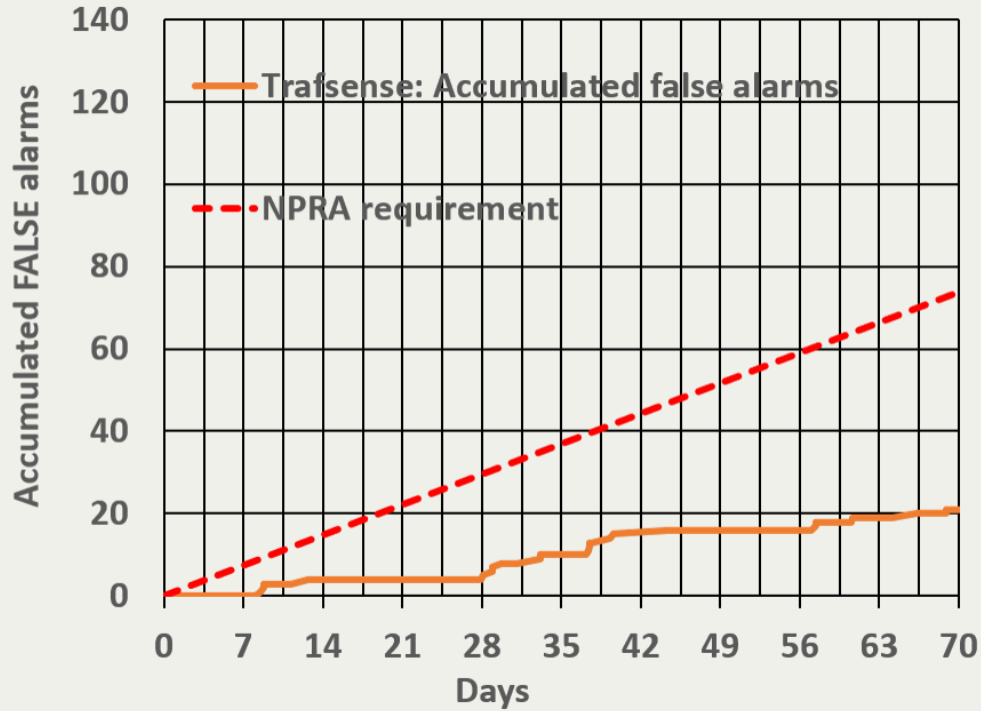


Norsensor DFOS — Distributed Fiber Optic Sensing

The whole fibre listens. **Every vehicle is followed and every event is located.**



	Point sensor	DFOS
Vehicle count	✓ Yes	✓ Yes
Speed along the whole section	✗ No	✓ Yes
Overtakings & lane changes	✗ No	✓ Yes
Stopped vehicles anywhere	✗ No	✓ Yes
Digging & tampering near the route	✗ No	✓ Yes
Exact position of every event	✗ No	✓ Yes
No power or electronics along the route	✗ No	✓ Yes



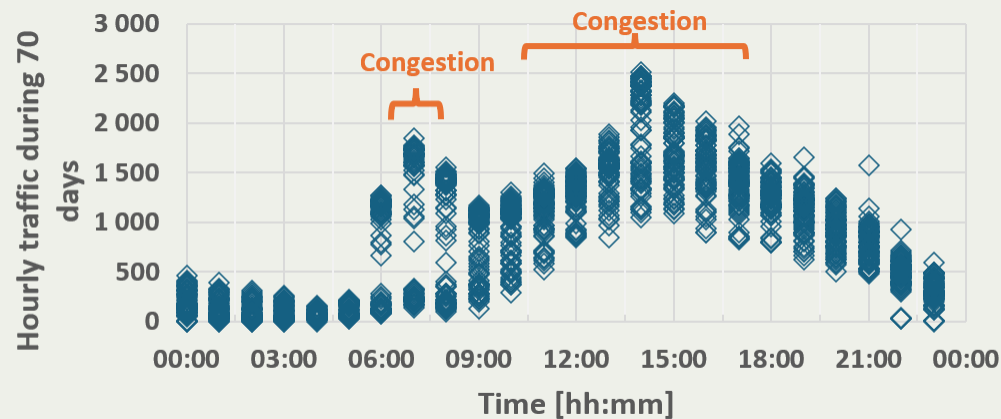
Less than 0.28 false alarms per km per 24h

Based on 1.5 million passing vehicles over 70 days

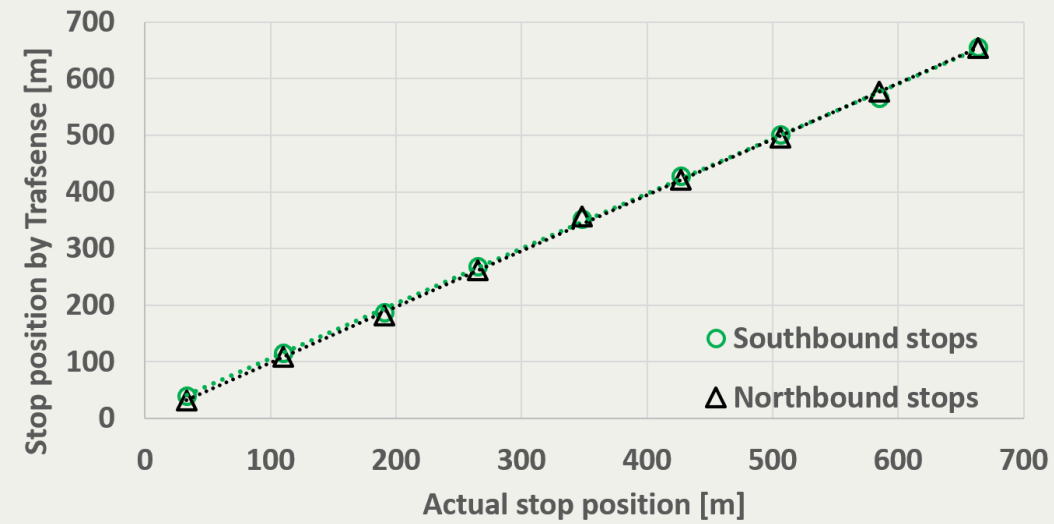
The Norwegian Public Roads Administration (NPRA) requirement: < 1 false alarm per km per 24 hours

71 149 passing vehicles between each false alarm

Equals 80 hours between each false alarm



Automatic Incident Detection (AID)



Standard deviations

Stop position: 6 m

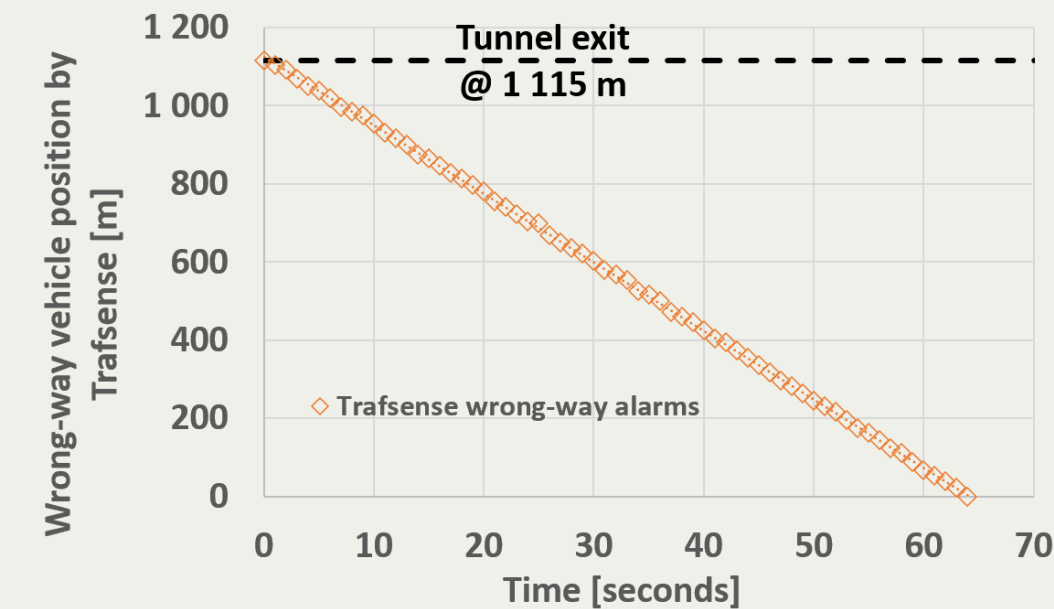
Wrong-way vehicle: 10 m

Mean Time to Detect

Stopped vehicle: 11 seconds

Wrong-way vehicle: 3 seconds

The Norwegian Public Roads Administration (NPRA) requirement: < 20 seconds



Accuracy of AID



**Joint tunnel demo w/
the Norwegian Public
Roads Administration**

Precise detection of stop
positions of vehicles trapped
in a tunnel by smoke

Playback functionality available for
the road operator for
identification of the stop
positions of trapped vehicles

Potentially life-saving info

Video cameras within the
visible spectrum are blinded
by smoke



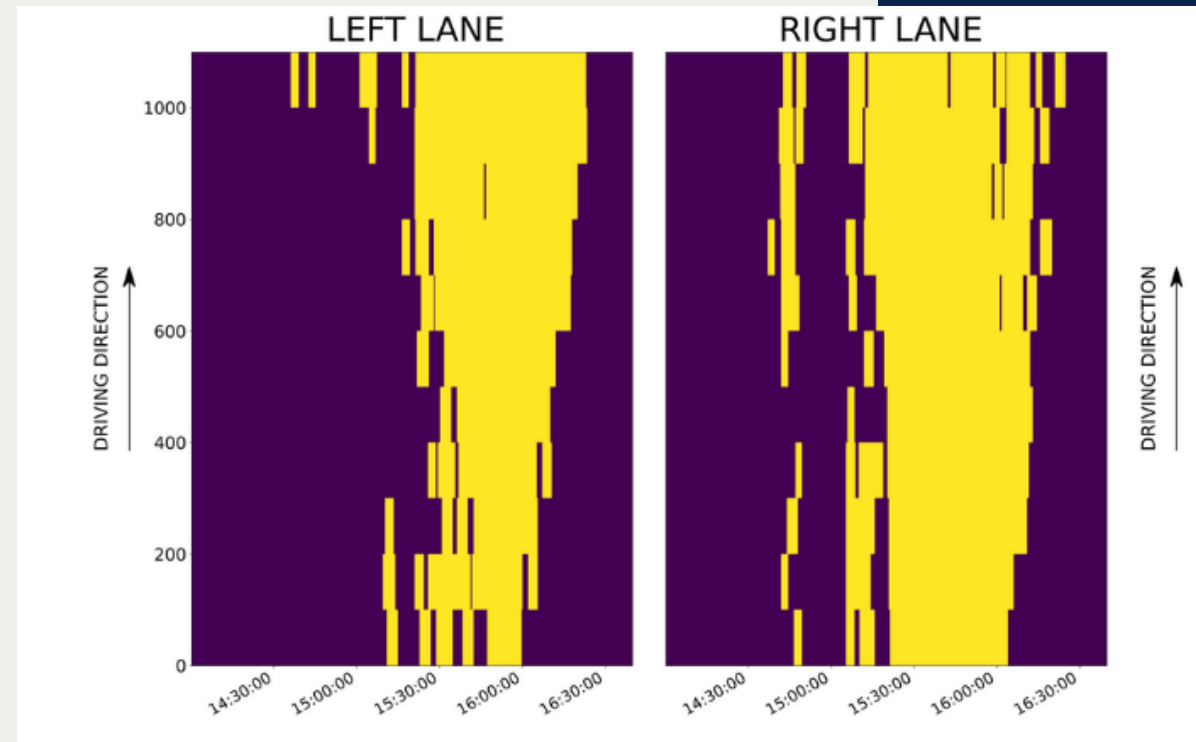
Added value of accurate AID



Queue detection

Percentage queue per lane is reported every three minutes

Spatial resolution 100 m





Carriageway at 100 km/h

Blue line: Vehicle in right lane

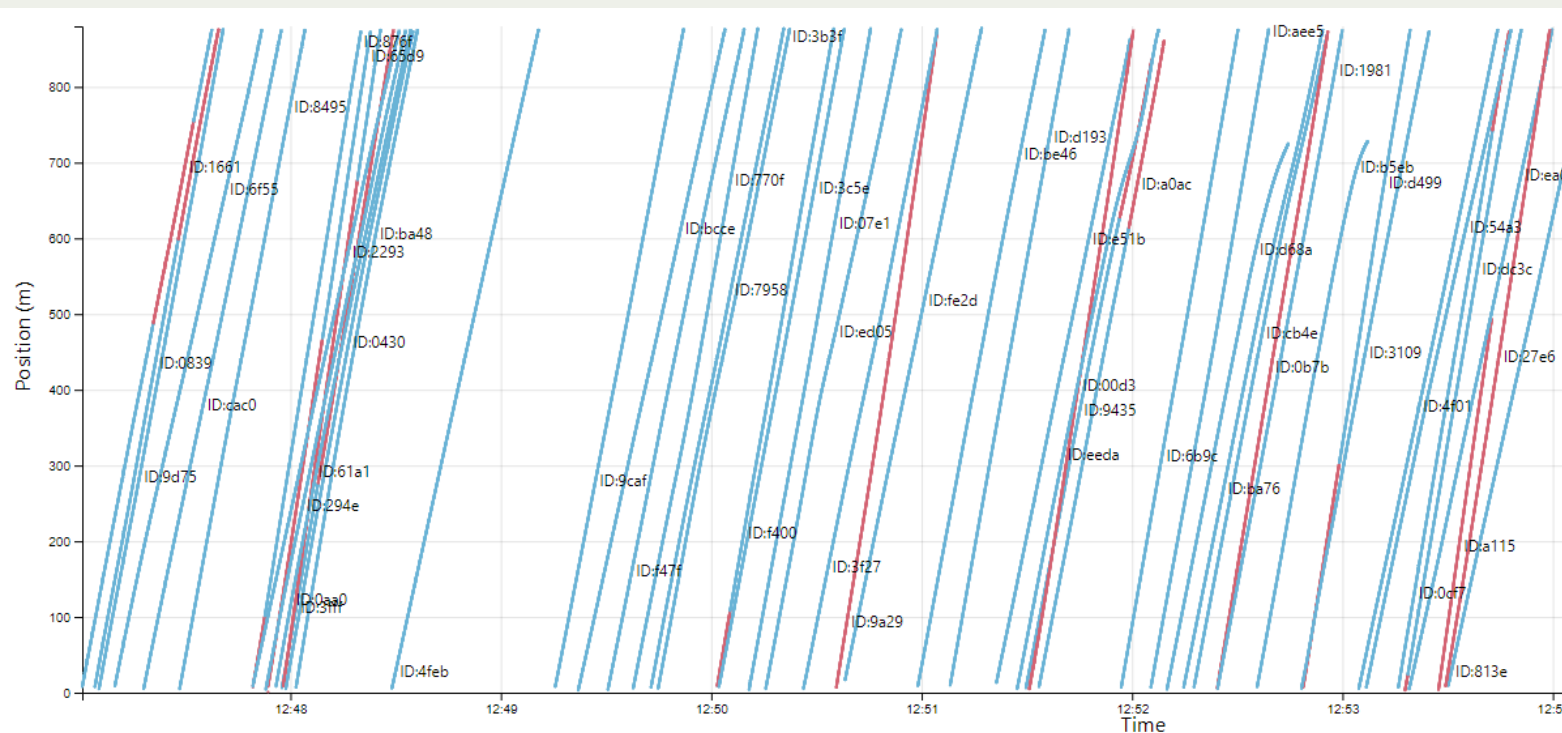
Red line: Vehicle in left lane

Lane changes, overtaking, and exits
detected

Updated 65 times
per second

Spatial resolution 1 m

Vehicle length estimated



Vehicle tracking



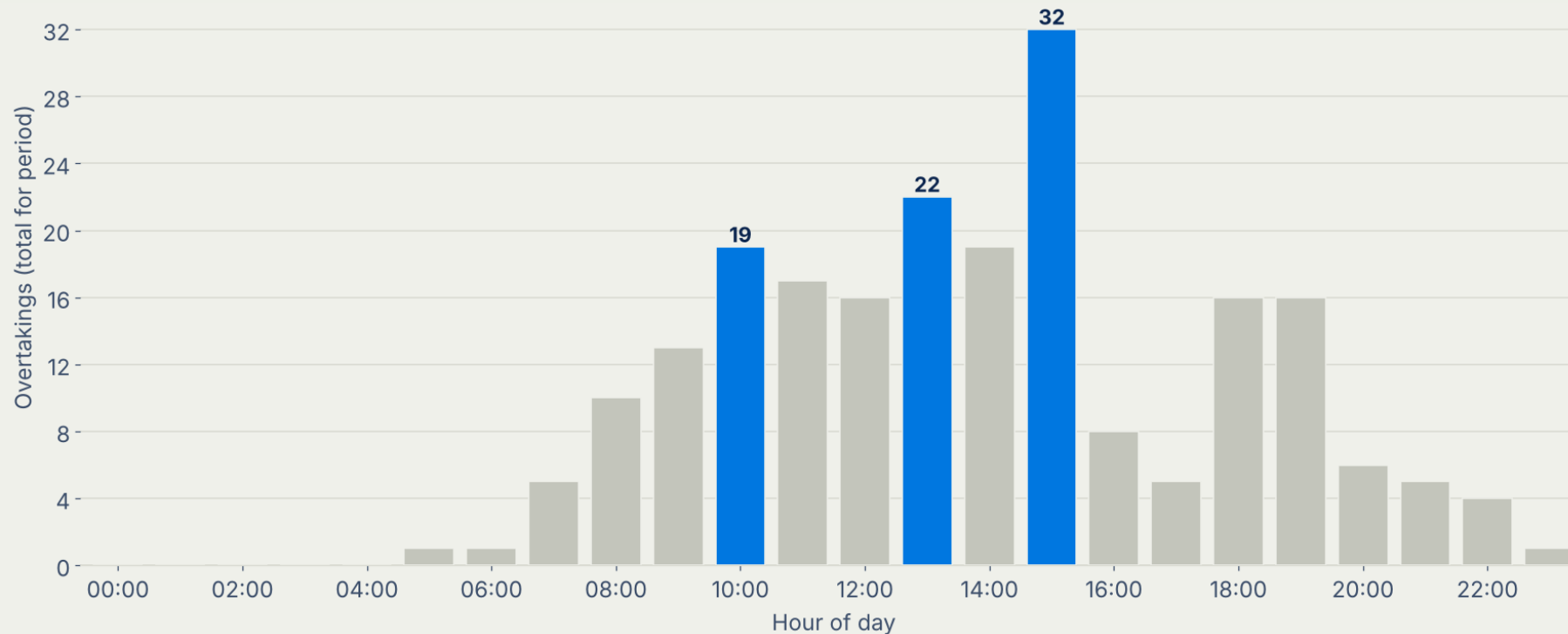
A unique distributed traffic sensor

Point sensors are not able to continuously monitoring the full road length

Data on vehicle density, speed distribution, and significant driving patterns like overtakings, may provide both vital insights into sub-optimum road signage or design

Real-world data

Measured over 24 h in the Bogsfjellet tunnel E39 2026-09-30



Traffic flow analysis



Traffic at a glance

The traffic data are captured continuously along the monitored road

Real-world data

Measured over 24 h in the Bogsfjellet tunnel E39 2026-09-30

4 208

vehicles counted

in 49 hours of monitoring

76 km/h

average speed

measured along the fibre, not at one spot

267

vehicles in the busiest hour

Fri 02 Oct, 15:00

45 %

of vehicles above 80 km/h

speed-compliance insight

216

overtakings detected

invisible to single-point sensors

99.0 %

data availability

minute-by-minute reporting

Traffic flow analysis



Contact info

Norsensor AS, Fjellsdalen 3, 5155 Bønes, Norway

+47 556 27 520

contact@norsensor.com

www.norsensor.com

