



camea

SPEED ENFORCEMENT
Solutions for **AFRICA**

Weigh-In-Motion • Dimension-In-Motion • Speed Enforcement • Traffic Counters • Smart Cameras

CAMEA Speed Enforcement

Field-proven systems for safer roads and calmer environment.



Lower Speed



Less Noise



Cleaner Air

CAMEA Speed Enforcement Advantages



Fully Automatic Digital System

- No human interference with no possibility of corrupt behavior.
- Violations evaluated and documented automatically and immediately sent to the relevant authorities for fining.



Various Speed Limits Can Be Set

- Based on the requirements (e.g., night vs day).
- Based on the vehicle class (e.g., truck vs passenger car).

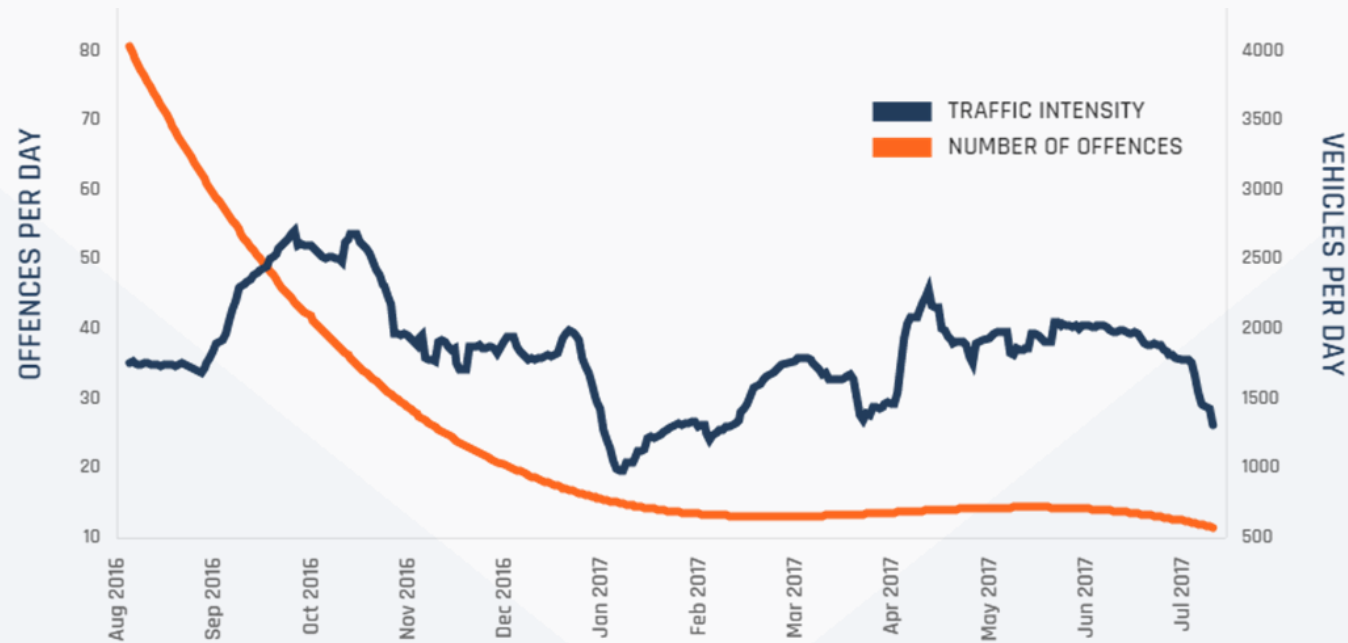


High Utility Value

- Drivers timely and conclusively informed of the speed limit and their speed.
- The system can be extended to detect other traffic offenses.

Achievements of Speed Enforcement

The number of speeding drivers is typically reduced by around **80 %** within a **FEW MONTHS** after the installation.



Speed Enforcement Solutions



Speed Enablement at WIM stations

- Making use of already installed in-road sensors (weighing sensors or loops).
- Only additional SW licenses are necessary, no need to install new HW.



Radar Speed Measurement

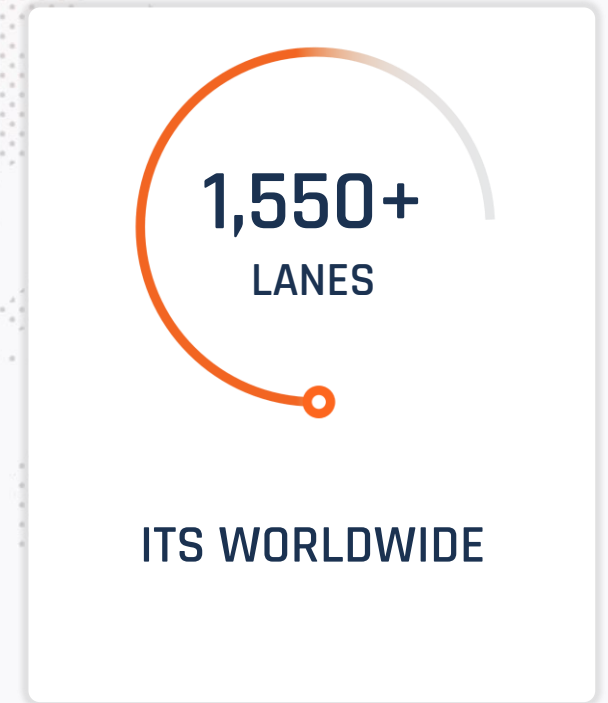
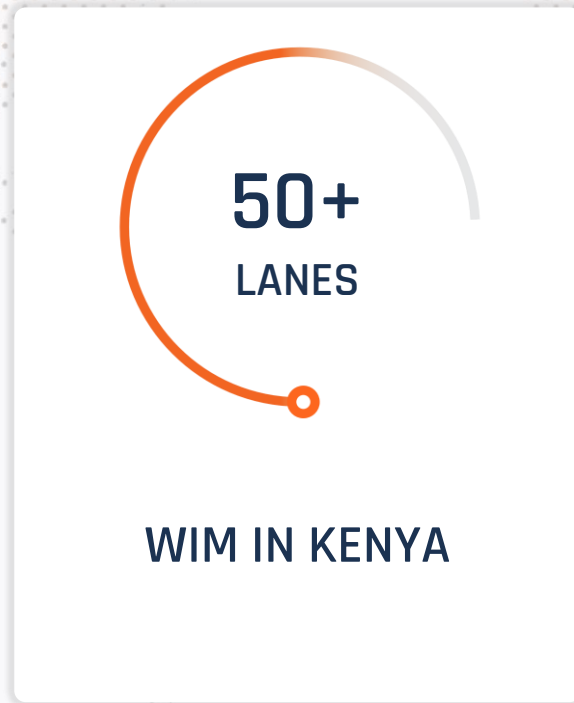
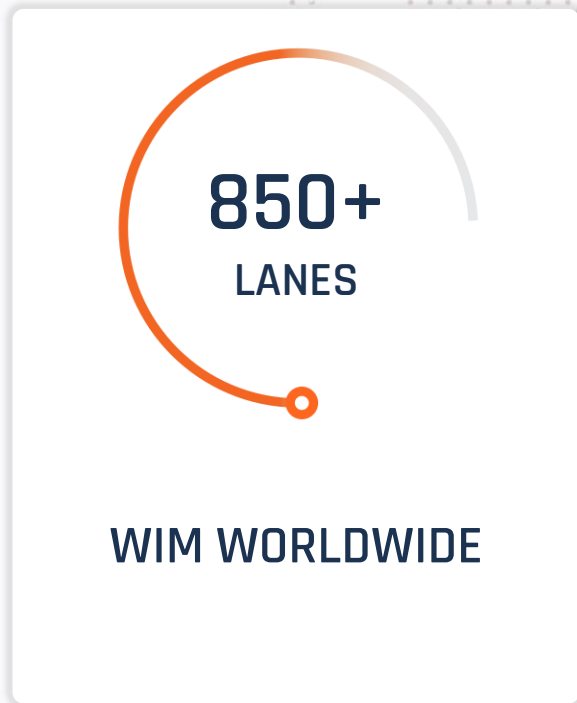
- Speed enforcement in the immediate area around the radar (up to 100 m).
- Suitable for locations with a higher risk of accidents and dangerous situations.



Section Speed Measurement

- Speed enforcement over a longer stretch of road (i.e., not just near radar).
- Suitable for locations with the need to ensure the smooth passage of all vehicles.

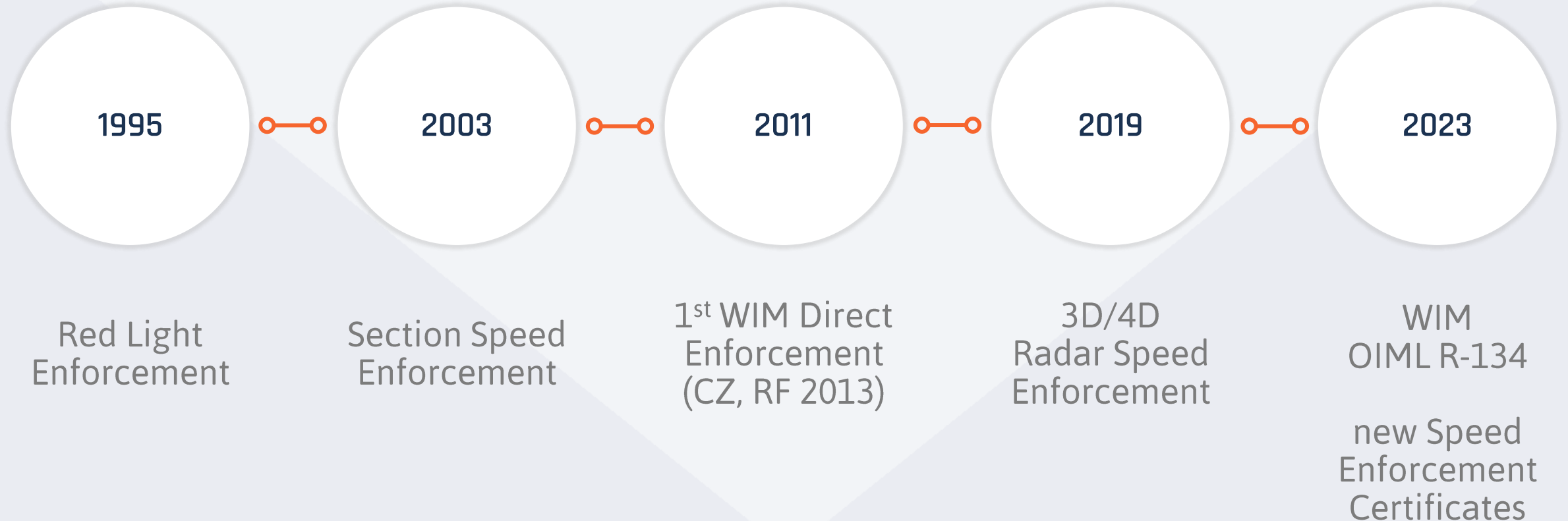
We Have Extensive Experience Worldwide



We Have Extensive Experience Worldwide



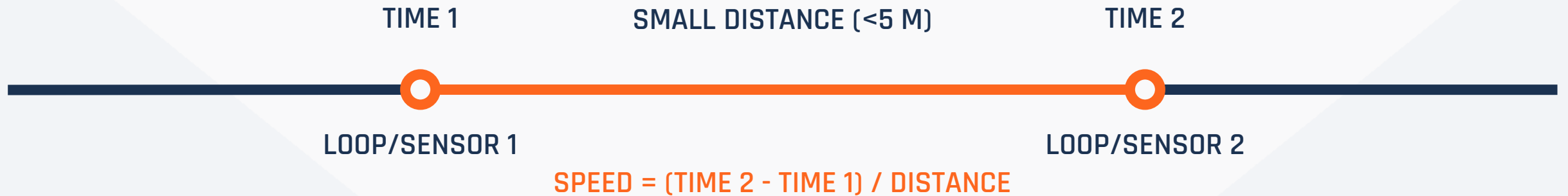
We Are Experts in Direct Enforcement



CAMEA Prague City ITS (CZ)

- City WIM
- Speed Enforcement
- Red Light Enforcement
- Other ITS

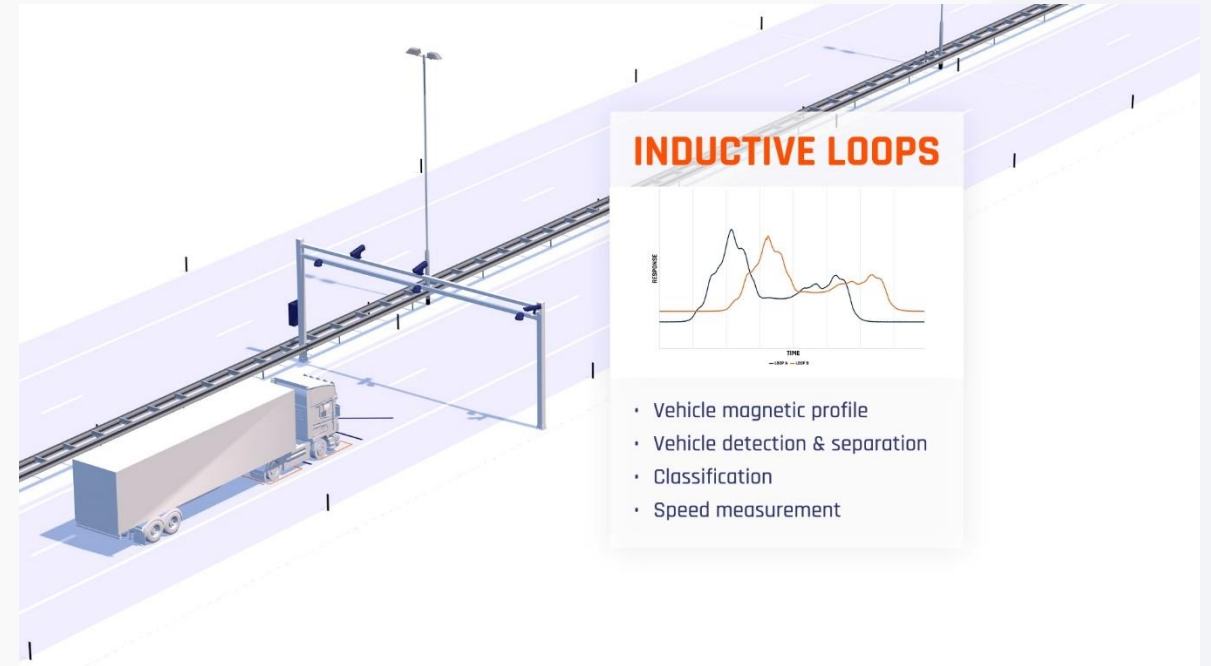
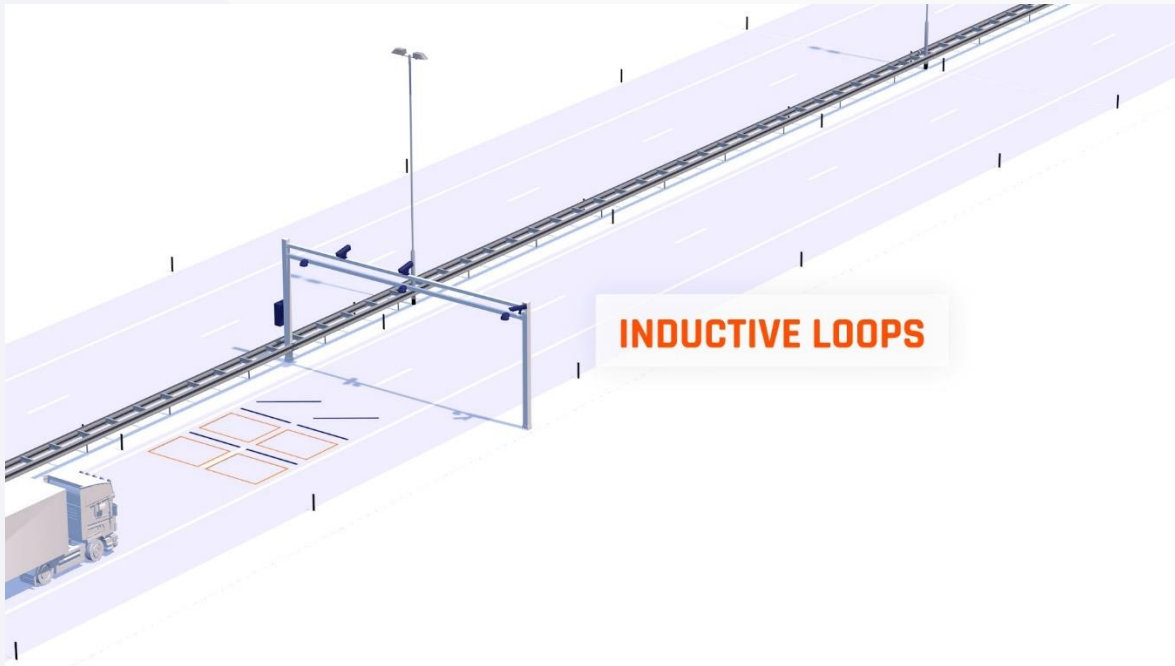
Speed Enablement at WIM Stations



- Additional Requirements: SW license
- Used Technology: Weighing sensors or inductive loops
- Principle: Measurement of the time difference over a known distance between the sensors. The distance is very small and therefore can be determined as current speed.

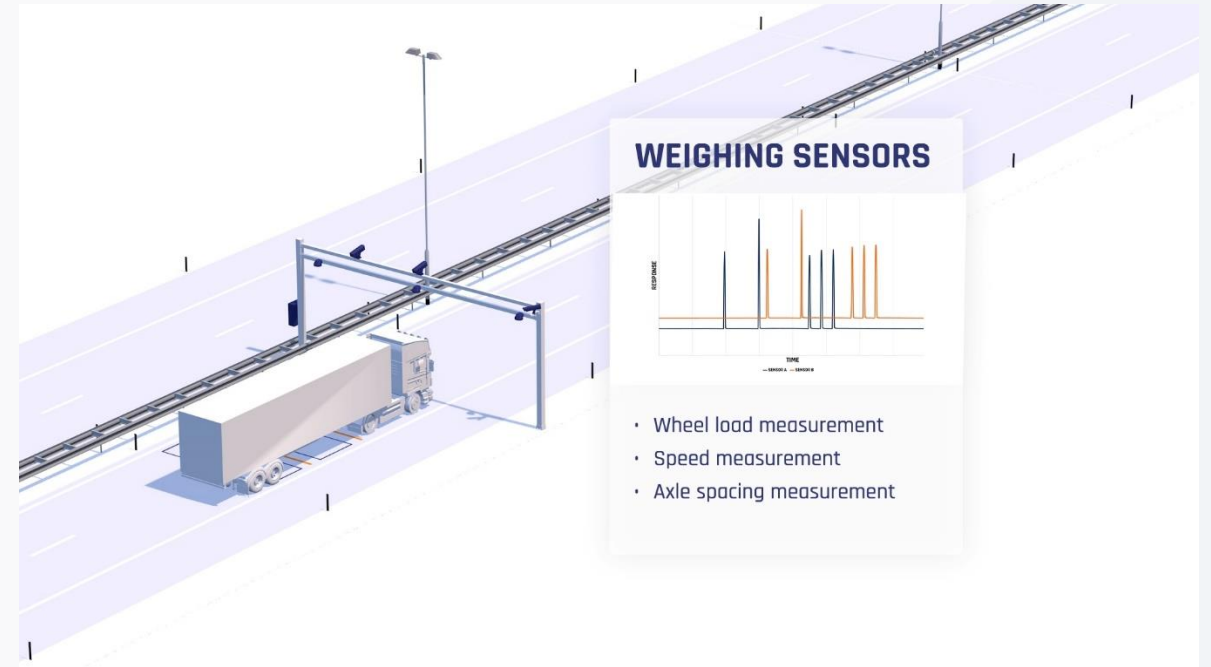
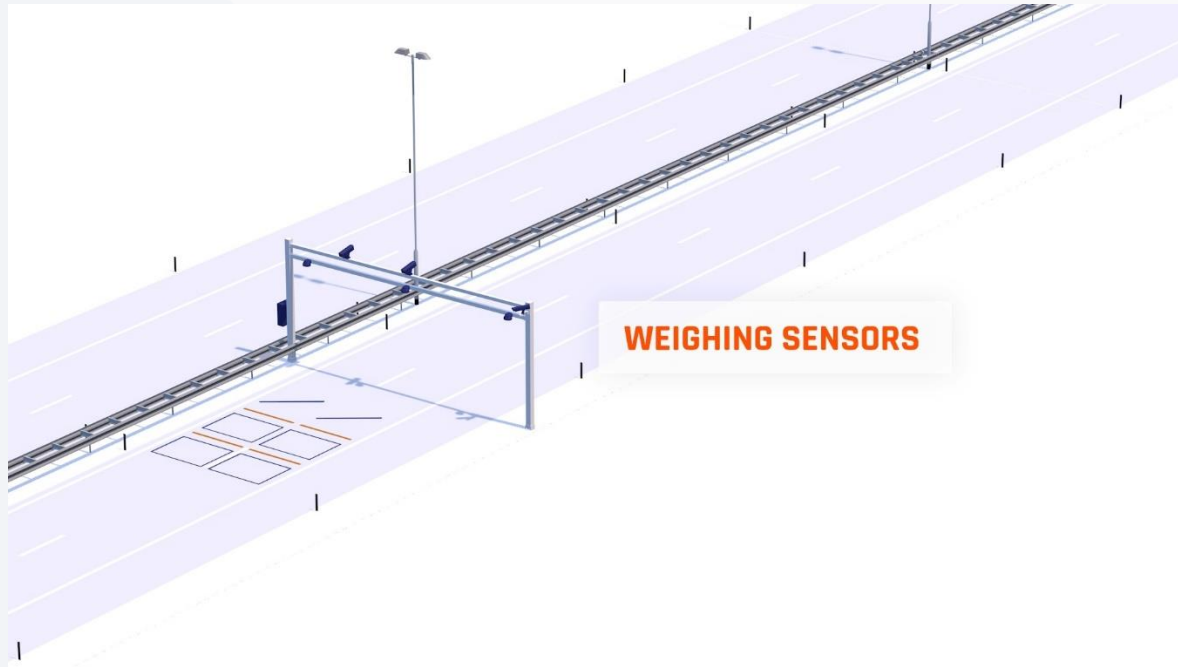
Speed Enablement at WIM Stations

Using inductive loops for speed measurement.



Speed Enablement at WIM Stations

Using weighing sensors for speed measurement.



Speed Enablement at WIM Stations

Making use of the already installed technology by adding a SW module.

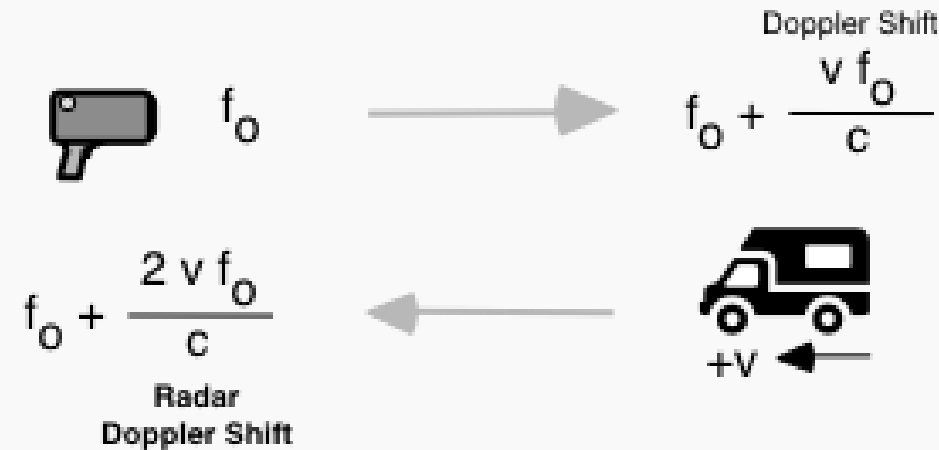


Type Approval

- Speed enforcement using inductive loops.
- First type approved in 2007 in the Czech Republic.
- Currently valid until November 12, 2028.



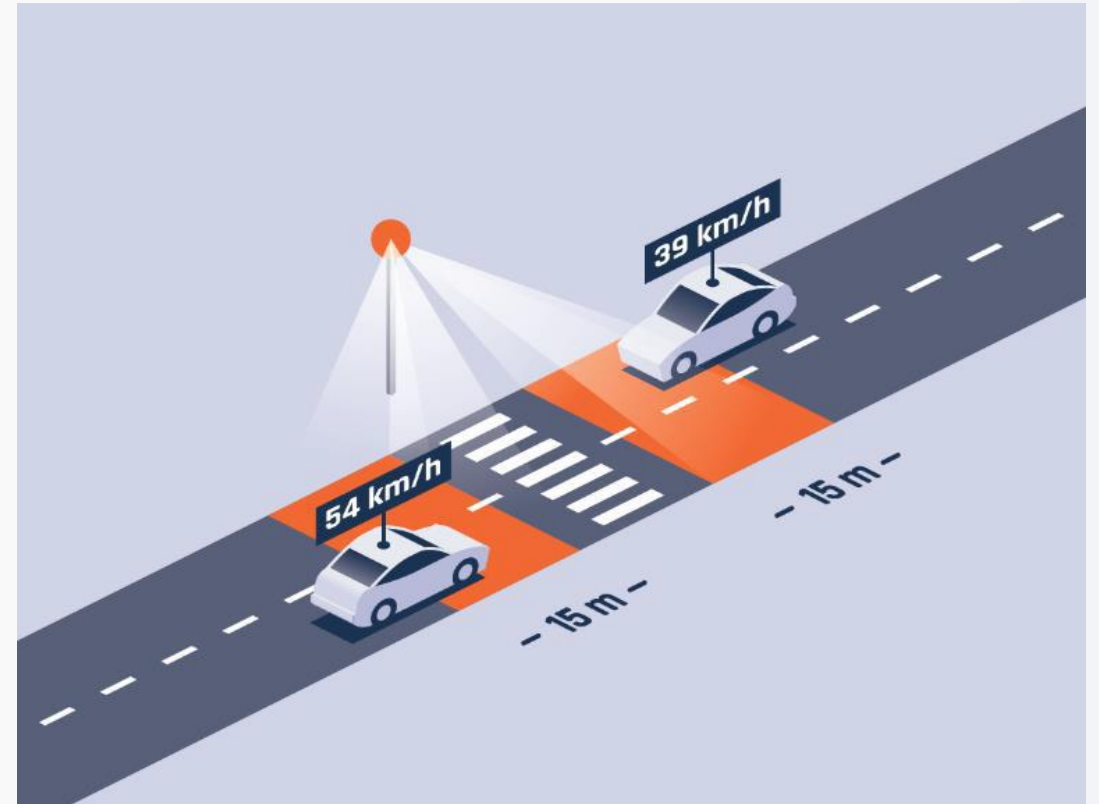
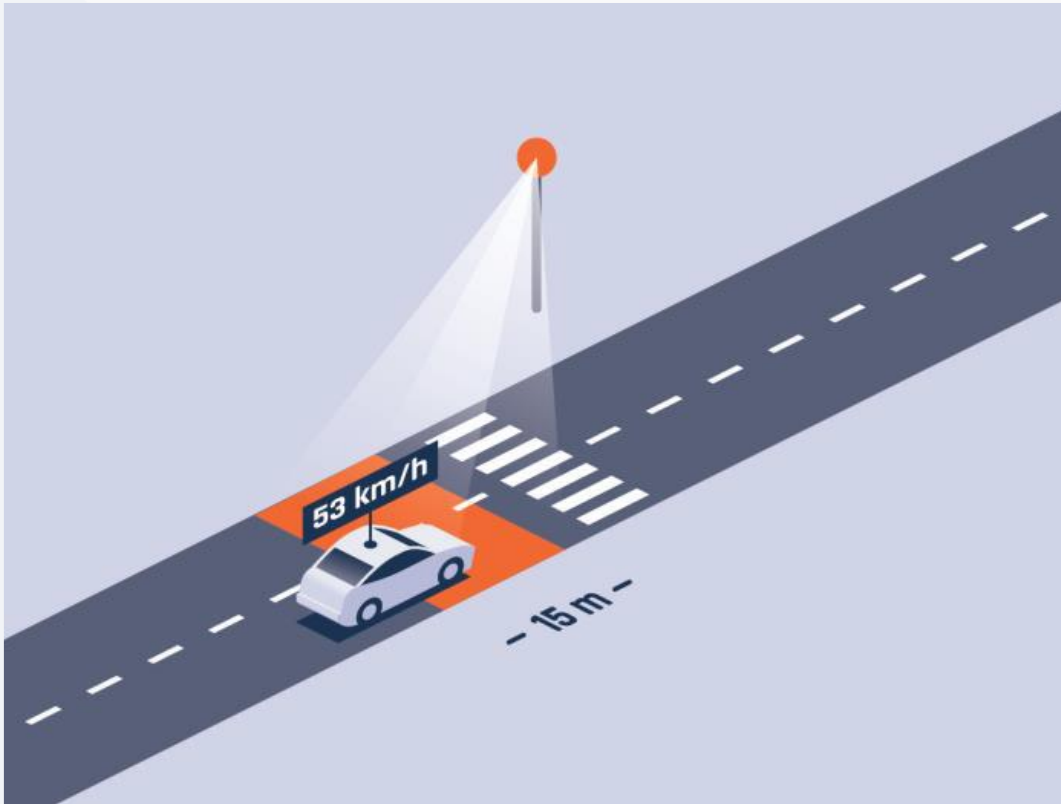
Radar Speed Enforcement Overview



- Additional Requirements: HW (if not already installed) and SW licenses
- Used Technology: ANPR camera, 3D/4D traffic radar
- Principle: Using the radar Doppler Shift to measure the spot (current) speed and vehicle movement tracing to measure the section (average) speed.

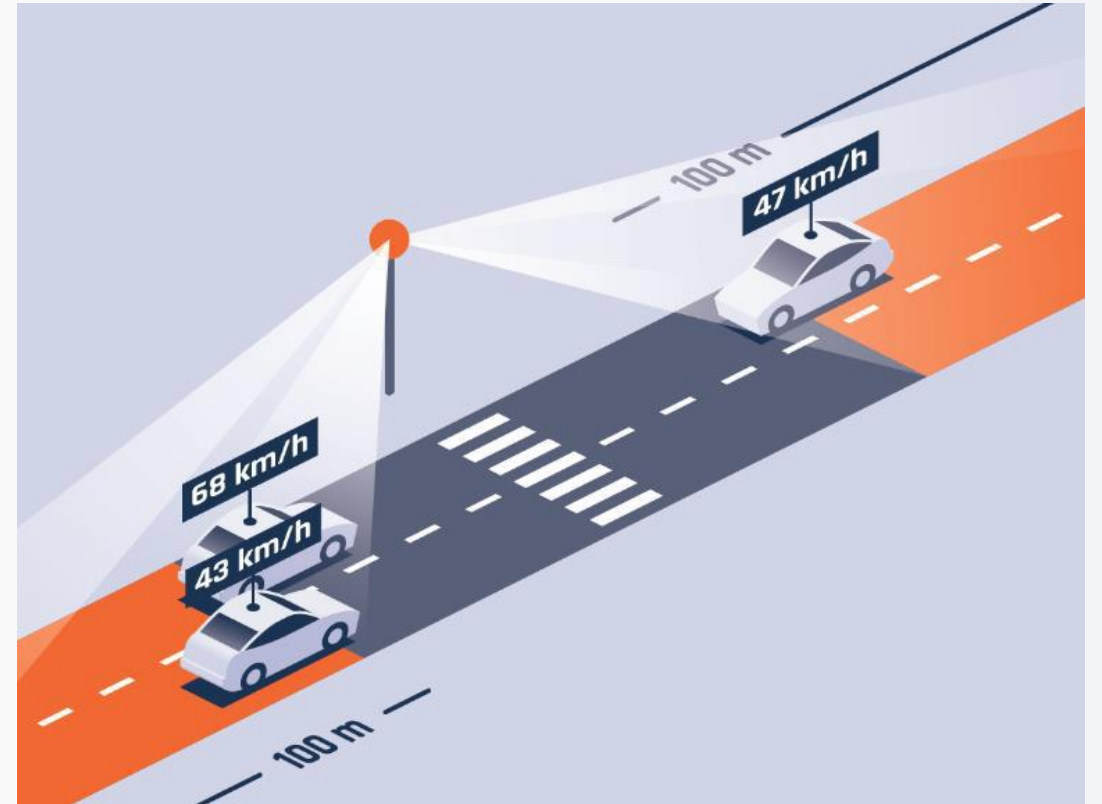
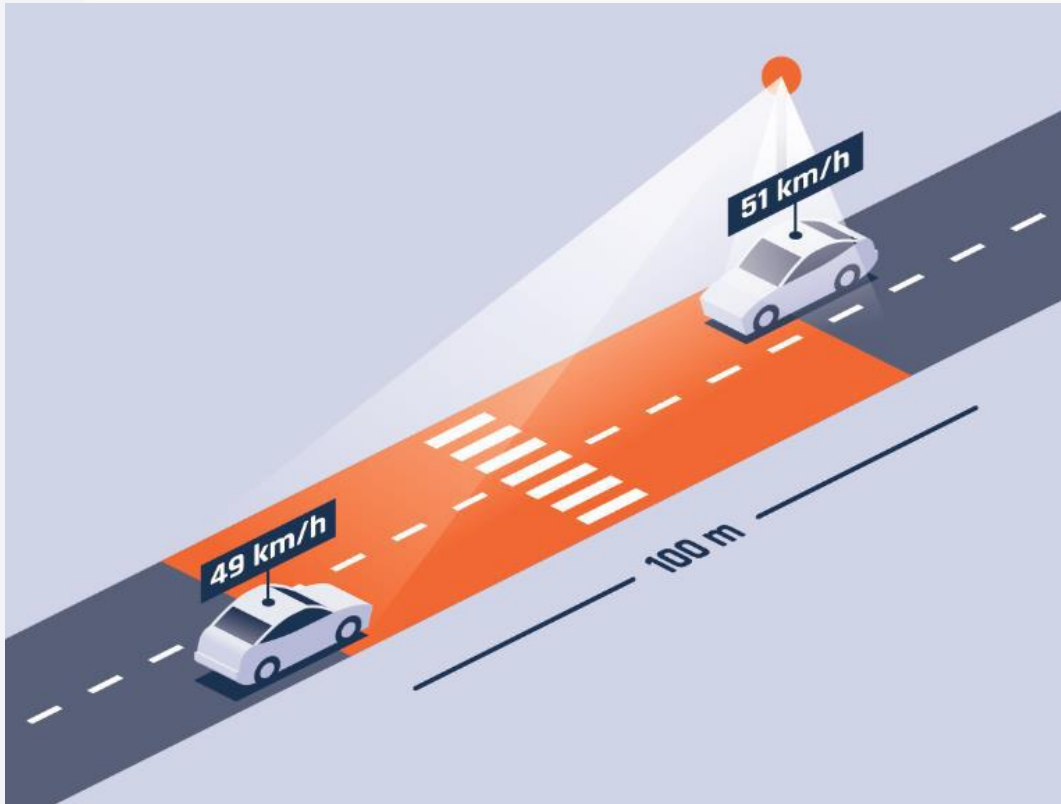
Radar Speed Enforcement Use Cases

Road safety at pedestrian crossings.



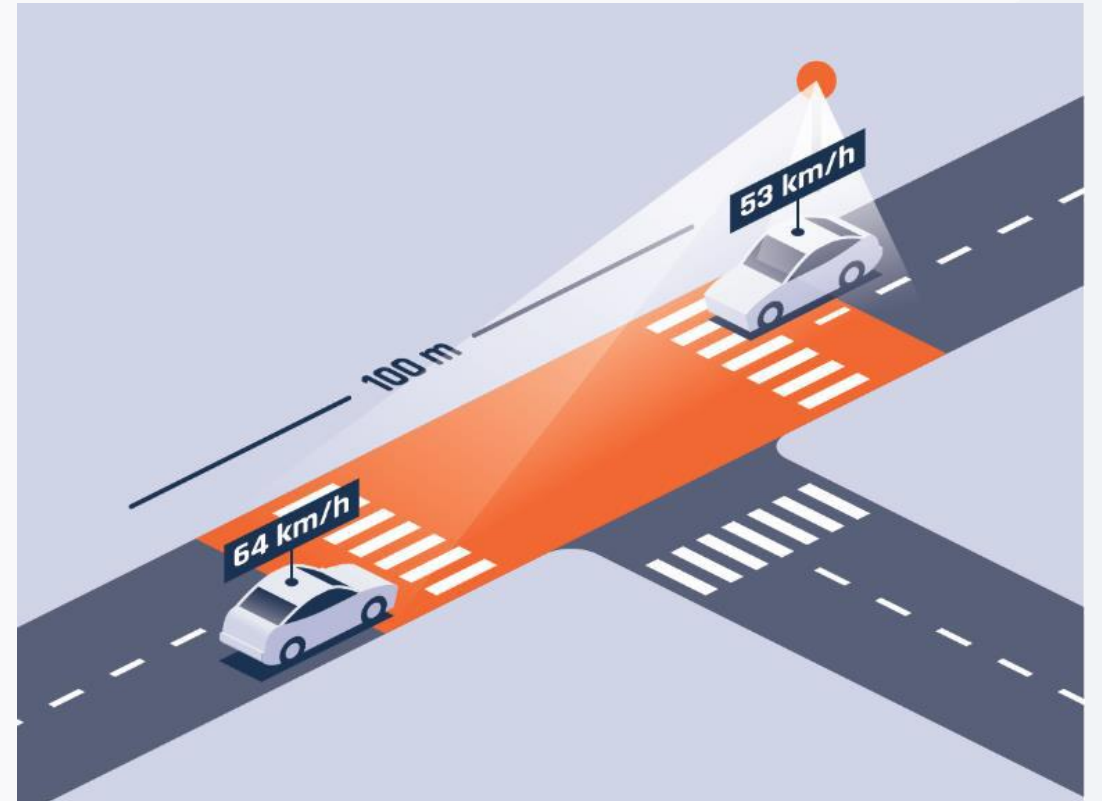
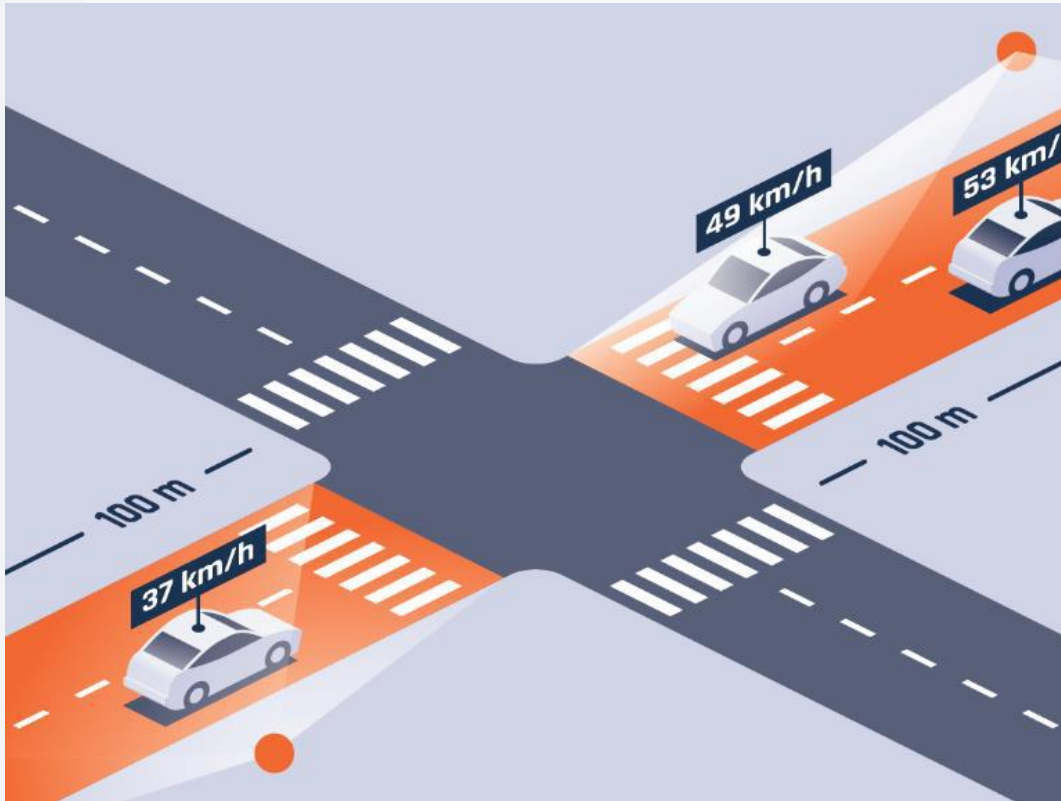
Radar Speed Enforcement Use Cases

Road safety at pedestrian crossings.



Radar Speed Enforcement Use Cases

Road safety at road intersections.



Radar Speed Enforcement Installation Examples

Installation at pedestrian crossings and intersections in towns and cities.



Radar Speed Enforcement Installation Examples

Installation at pedestrian crossings and intersections in towns and cities.

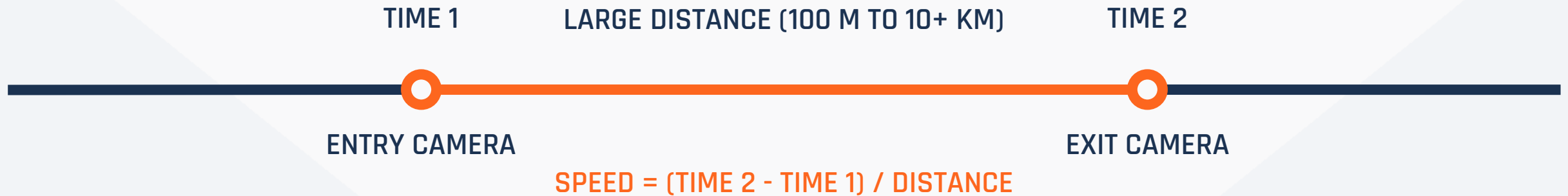


Type Approval

- Speed enforcement using a 3D/4D radar.
- Version 1
 - Measurement of current speed.
 - First type approved in 2019 in the Czech Republic.
 - Currently valid until March 14, 2029.
- Version 2
 - Measurement of both the current and section speed in a short section (up to 100 m).
 - First type approved in 2023 in the Czech Republic.
 - Currently valid until October 8, 2033.
- Type approval under way in Slovakia.



Section Speed Enforcement



- Additional Requirements: HW (entry and exit) and SW licenses
- Used Technology: ANPR cameras at entry and exit points
- Principle: Measurement of the time difference over a known distance between the entry and exit points. Existing systems with ANPR cameras can be used as the points. Multiple sections can be linked and chained.

Section Speed Enforcement Principle

ANPR Camera at Section Entry Point



ANPR Camera at Section Exit Point



Type Approval

- Section speed enforcement.
- First type approved in 2003 in the Czech Republic, in 2013 in Poland, 2015 in Italy, .
- Currently valid in CZ until December 4, 2033.
- Type approval under way in Slovakia.

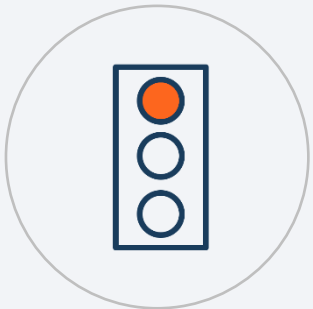


Combining Section Speed and Other ITS



Radar Speed Enforcement

- Using radar cameras as an entry or exit point of the section.
- The radar camera also works as a place of current speed measurement.
- For example, to measure the speed of vehicles approaching the point from which the section speed of vehicles will be measured.



Red Light Enforcement

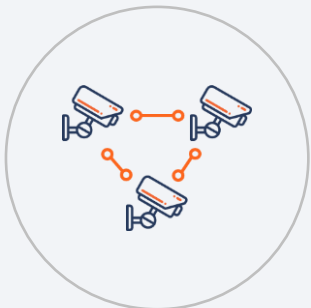
- Combination of detection and documentation of red-light violations together with speed measurement in the intersection or pedestrian crossings.
- This station can also be used as an entry or exit point of the section.

Combining Section Speed and Other ITS



WIM Stations

- Using WIM stations as an entry or exit point of the section.
- The WIM station also works as a place of current speed measurement.
- The section speed can also be measured between two WIM stations without any additional HW.

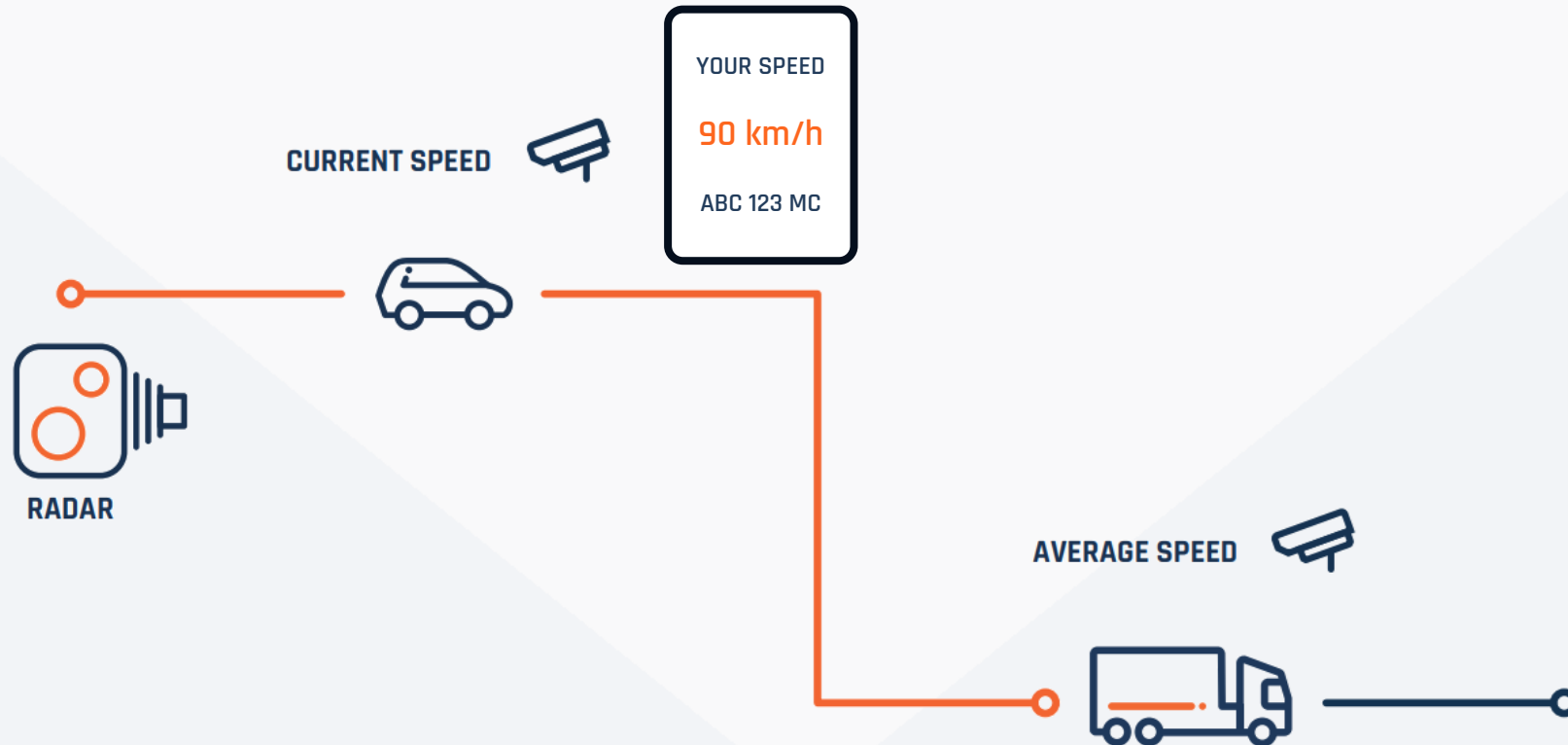


Chaining Multiple Sections

- Multiple points can be chained to create multiple sections with high variability.
- Example: points A, B, and C can form sections A-B, B-C, A-C and so on.
- For example, a whole city ring road can be monitored (not just one location, as is the case with radar).

Combining Current and Section Speed

Using the current speed measurement system as an entry to the section.



Combining Current and Section Speed

ANPR Camera with Radar at Section Entry Point

ANPR Camera at Section Exit Point



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Speed Enforcement Installation Options

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ANPR Camera Installation Options



GANTRIES



POLES



**PORTABLE
HALF-GANTRIES**



**PORTABLE
TRAFFIC SIGNALS**

Installation on Gantries

Highways, ring roads, toll gates.



Installation on Poles

Urban or rural roads and highways, cities, towns, villages, public lighting.



Installation on Portable Half-Gantries

During road closures, temporary measurement by alternating direction.



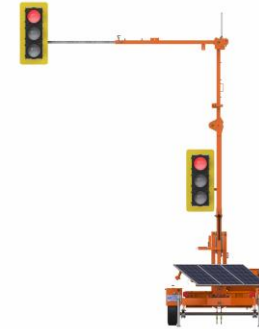
Installation on Portable Traffic Signals



**VEHICLE-MOUNTED
TRAFFIC SIGNS**



**SPEED SIGN
TRAILERS**



**TRAILER-MOUNTED
TRAFFIC SIGNALS**

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Speed Enforcement Violation Processing

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Speed Enforcement Violation Processing 1/5

The violation is detected, evaluated and documented.



Speed Enforcement Violation Processing 2/5

An offence document is generated and sent to the authorities.



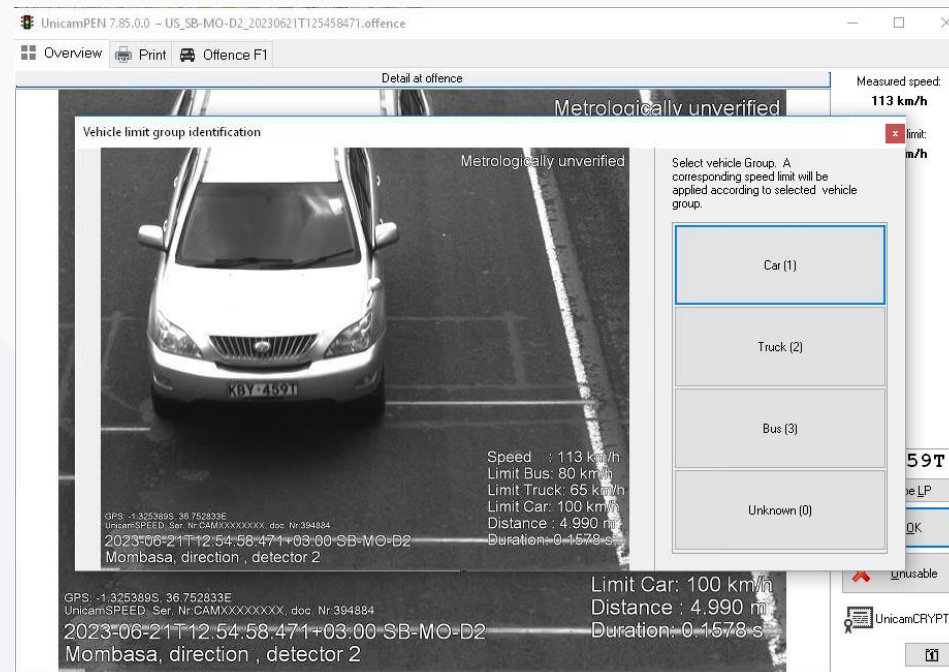
Speed Enforcement Violation Processing 3/5

The operator validates the offence - checks the license plate.



Speed Enforcement Violation Processing 4/5

The operator validates the offence - checks the vehicle class.



Speed Enforcement Violation Processing 5/5

The operator prints the offence.



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Speed Enforcement Possible Extensions

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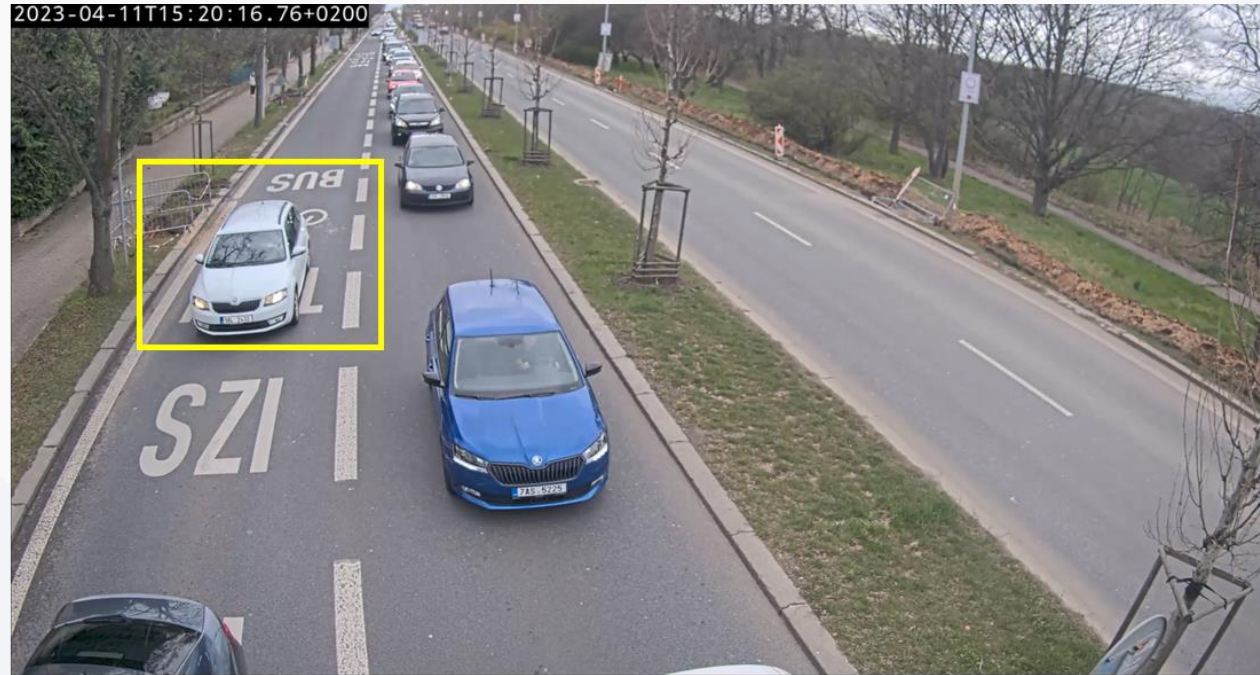
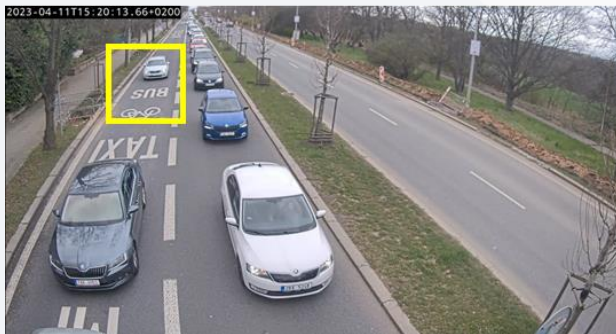
Examples of Extensions of the Camera Systems

The camera system can easily be extended using additional SW modules.

- ✔ Traffic Counting / Make and Model Recognition
- ✔ Monitoring of Dedicated Bus/Taxi Traffic Lanes
- ✔ Detection of Driving without Headlights at Night, Driving in Wrong Direction
- ✔ Vehicle Tracing - Journey Time Estimations, Traffic Studies, Searches for Stolen Vehicles
- ✔ Driver's Face - External Light Unit may be necessary
- ✔ Dangerous Goods - ADR Label Reading
- ✔ and many more...

Monitoring of Dedicated Bus Traffic Lanes

Video recording of the overall situation on the road (example from Prague, Evropská Street, Czech Republic, 2023/04/11)



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Thank you!

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