Traffic Management

Using ADEC TDC3 Traffic Detectors

Agenda

- About Us
- Traffic Management using TDC3
- Features of the TDC3 Traffic Detectors
- TDC3 Classification Capabilities
- Planning the Installation, Mounting
- Wiring
- References

About Us

- ADEC founded in 2009
- ADEC designs and manufacturers
  - Single-lane traffic detectors
  - IoT-Gateways
  - Traffic-Data cloud
- ADEC is
  - Privately held, owner-managed

Reasons For Measuring Traffic (1/2)

Highest ROI of any Capacity-Increasing Road Project

- Traffic management substantially increases roadway capacity
  - Prevents, or at least delays, stop-go-traffic when traffic volume increases
- Traffic detectors are input and thus key component for any traffic management solution

Reasons For Measuring Traffic (2/2)

Valuable information about road usage for resource allocation

- Statistical information about road usage
  - For effectively allocating road construction and repair funds
  - For up-to-date traffic modeling

Traffic Management System

Components of a traffic management system

- Network of evenly distributed measurement points along highways and on/off ramps (“sensor network”)
- Variable message signs (“VMS”) at key locations
- Traffic management center (“TMC”) with algorithms to determine speed-limits and routing information for each key location

How does Traffic Management work?

Adding traffic management to highways yields the highest ROI

- Controls flow of traffic by
  - measuring traffic volume and speed via sensor network in real-time
  - calculating optimized speed limits to prevent, or at least delay, capacity-killing stop & go traffic when traffic increases
  - updating speed limits or suggested routes to motorists via variable message signs or V2I

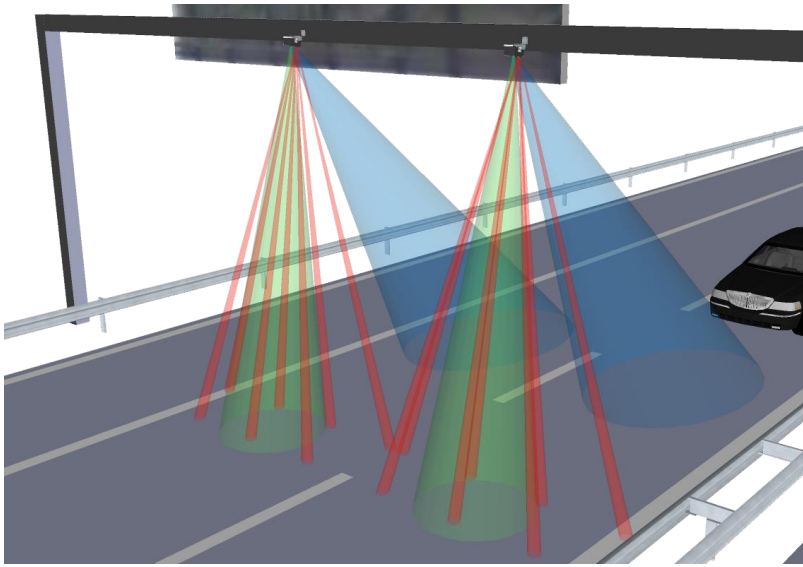
Traffic Detectors

For traffic management, inter-urban sensor network

- TDC3 means *three* sensors in *one* device
  - Mounted above the center of the lane
  - For each vehicle: Speed, occupancy & time-gap
  - Vehicle class, such as
    - Car, truck, van, bus etc.
  - Serial interface for data transmission

Three Sensing Technologies

In combination - For superior data quality

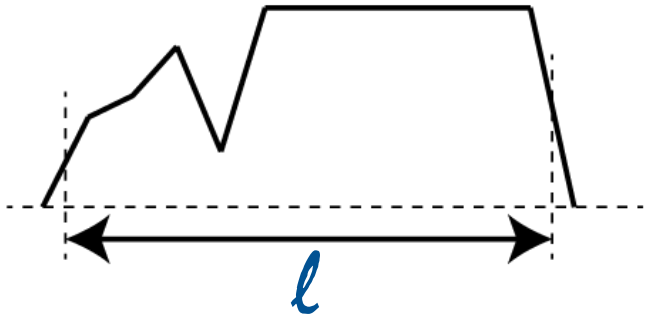


- Doppler radar
  - Vehicle speed
- Ultrasound
  - Vehicle height profile
- PIR motion sensor curtain
  - Vehicle width & lane position
- Combined: accurate individual vehicle data

Vehicle Classification

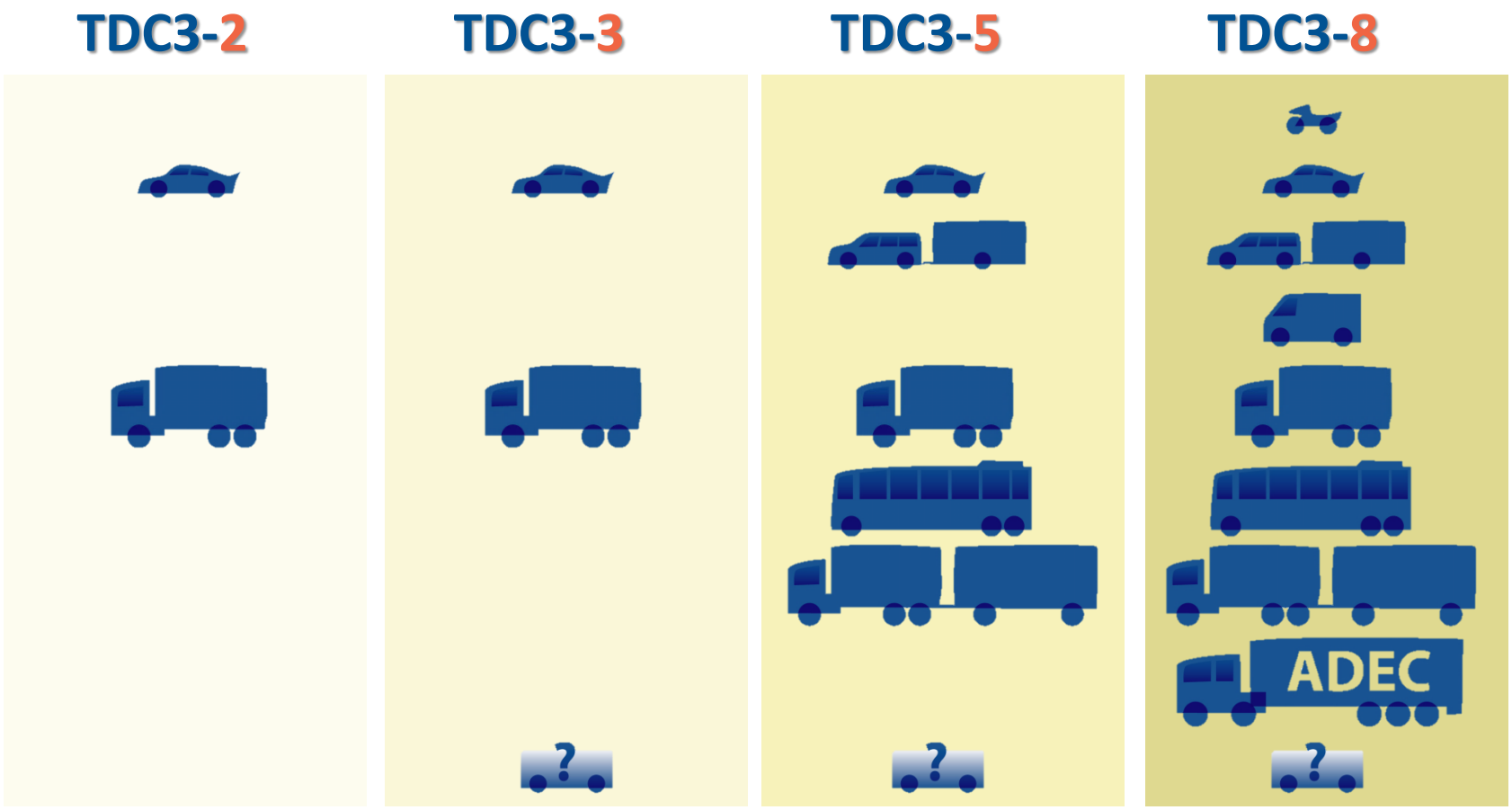
Assigns each vehicle to standardized vehicle class

- Common classification into 2, 2+1, 5+1 or 8+1 vehicle classes (+1 for “unassignable”)
  - Based on standardized German TLS classes
  - Custom classification available for classes that have *distinguishable* height profile

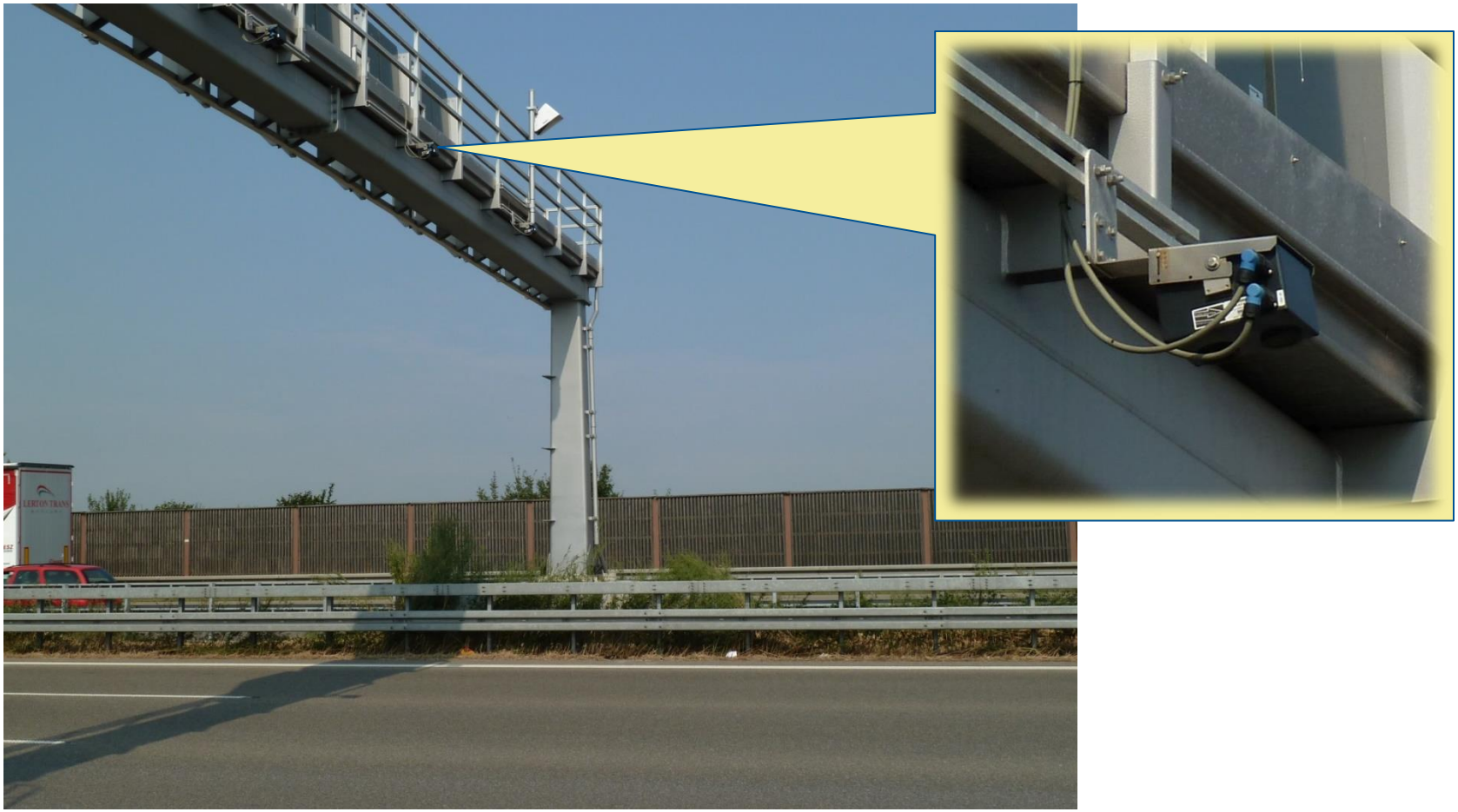


Model Designation for Classification

Every vehicle is most accurately assigned to the available classes



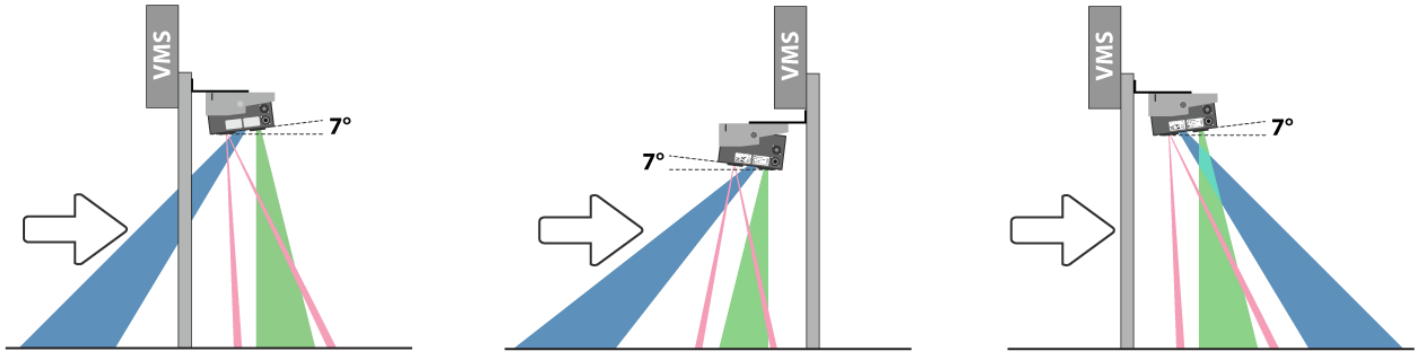
Mounting



Mounting Options

Options to accommodate mounting constraints

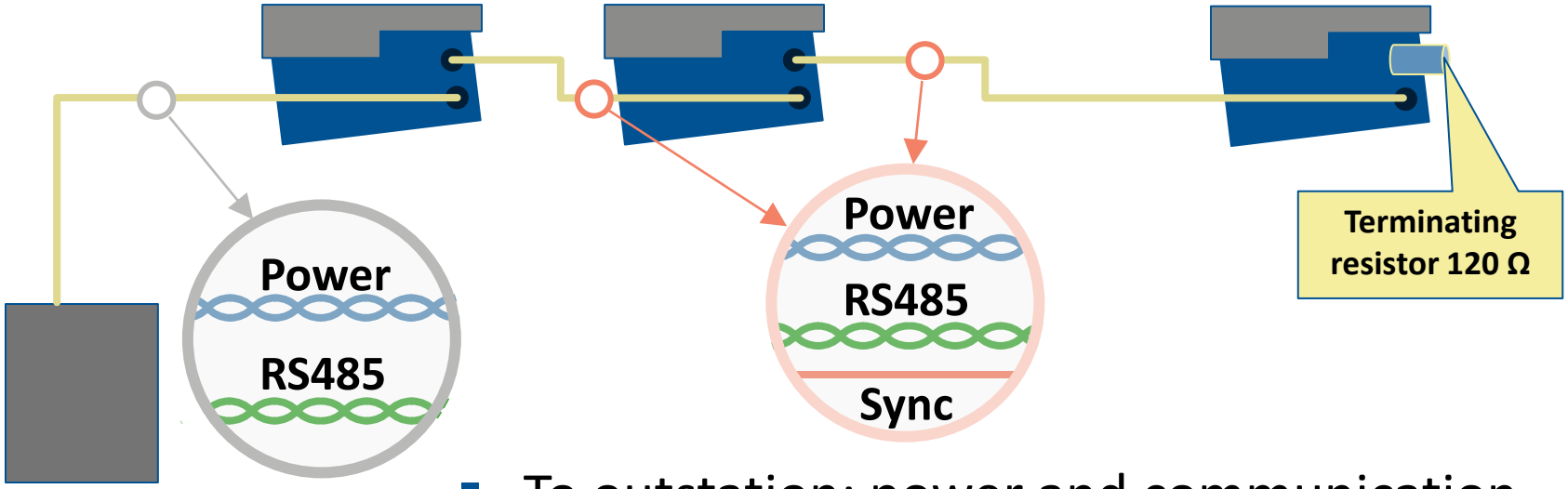
- All systems (radar, ultrasound and PIR) must have unobstructed view onto lane
  - Different detector hardware models to accommodate mounting constraints



TDC3-x-F-B **TDC3-x-F-F** **TDC3-x-B-B**

Wiring

Devices fit with male and female device connectors for bus-topology

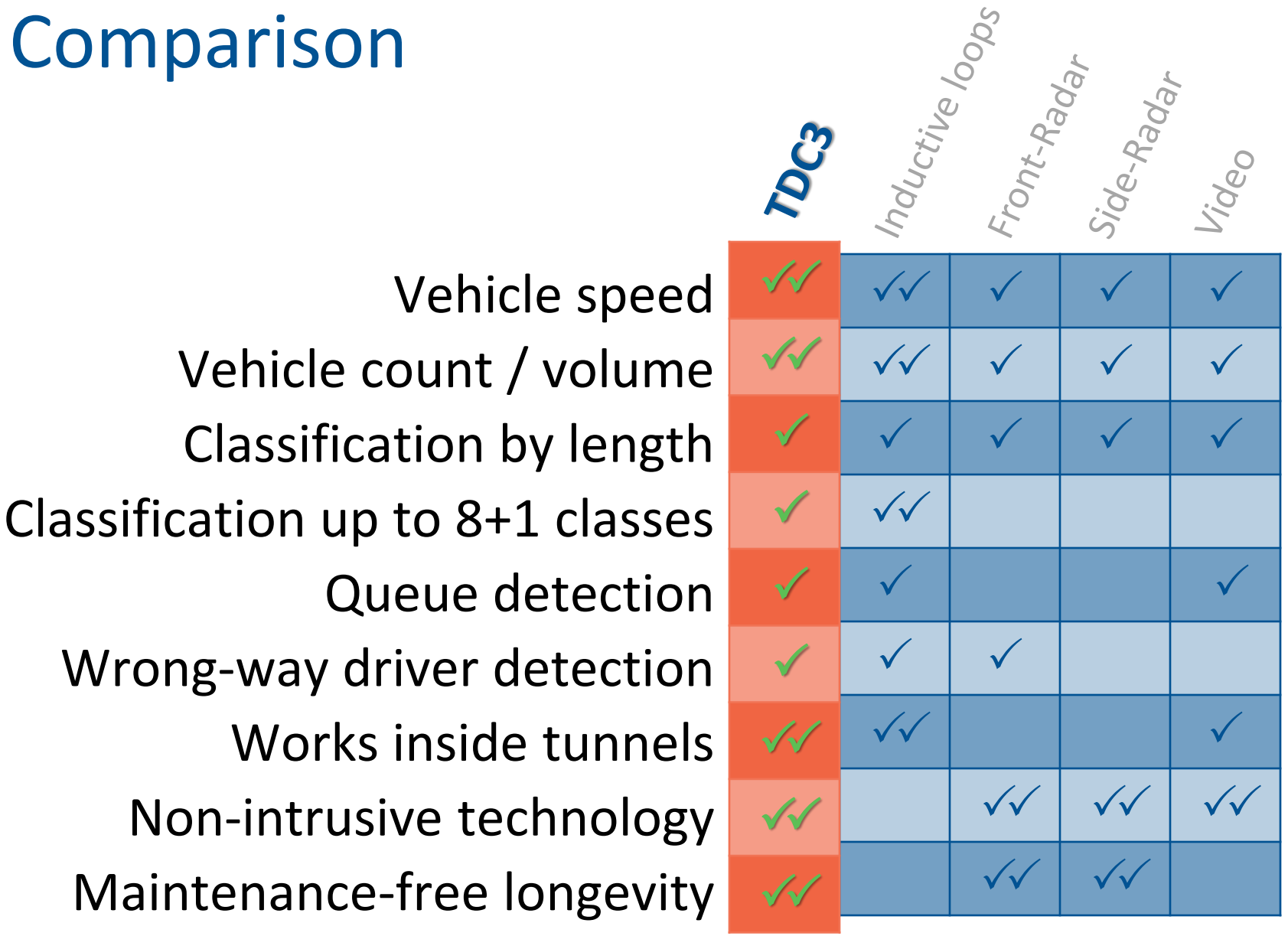


Outstation

- **Traffic Data Collector**
- **BS2, ADEC-Camina**
- **RS485 – TCP/IP Interface**
- **…**

- To outstation: power and communication
- Between detectors: extra SYNC(hronization)
- Last detector on bus: apply 120Ω terminating resistor (TDC-C-TR)

Comparison


TDC3
Inductive loops
Front-Radar
Side-Radar
Video
Vehicle speed
Vehicle count / volume
Classification by length
Classification up to 8+1 classes
Queue detection
Wrong-way driver detection
Works inside tunnels
Non-intrusive technology
Maintenance-free longevity

Installations

Short excerpt from installations worldwide

Country / Region	Project
Austria	A1/A10, A14, A2/A9, VBA Linz, A01/A21 and since 2017 nationwide
Azerbaijan	TDC3, 77 pcs
Brazil	TDC3, 139 pcs
Estonia	TDC3, >200 pcs, with custom classification
Germany	A5 (Zeppelinheim), BAB 1, A81, A3, A7, A8, A9 Nürnberg-München, Aubing, A14 Halle, A40/43, Emstunnel, A73, Stellingen, Schnelsen (Hamburg)
Netherlands	TDC3 in high-accuracy classification stations (CSC)
Italy	Catania, Monza-Meda, Lombardy, A32
Mexico	TDC3, 24 pcs
Poland	Urban, inter-urban, custom classification
Switzerland	VBA SO/AG, Bern-Thun, Zug, Zurich Ring Nord, Effretikon, Basel
Taiwan	Sohuo Highway
Slovenia	A1, Ring Ljublijana

Thank you!

If you have any questions, please contact us at:

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