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# How VITRONIC solutions make road traffic management **more** **sustainable**

TOLL ENFORCEMENT

Building a better  
pathway for  
future mobility



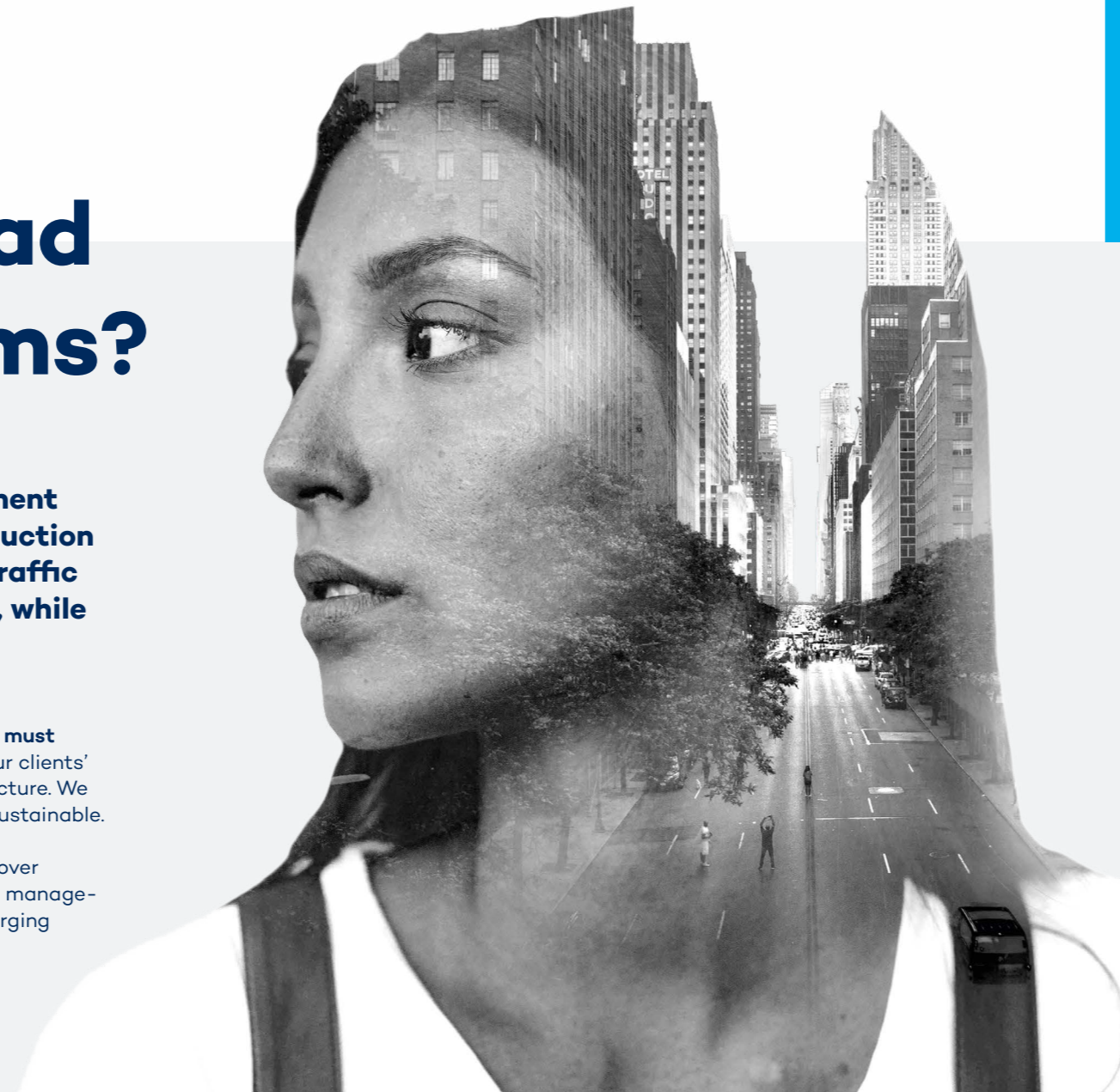
Currently, CO<sub>2</sub> emissions in the transport sector make up about 30% of emissions in developed countries and about 23% of total man-made CO<sub>2</sub> emissions worldwide. There is widespread agreement that CO<sub>2</sub> emissions need to be reduced radically. Developing practical concepts and models that help transform road traffic systems is key to a sustainable future.

# ” How can we transform road traffic systems?

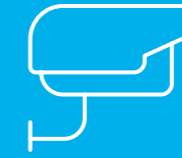
**At VITRONIC, we help each client implement their own individual carbon emission reduction concepts. We strive to implement road traffic systems that allow for efficient mobility, while taking people and nature into account.**

We know that **hardware, software, processes and workflows must work together** – precisely and seamlessly – regardless of our clients’ enforcement and collection requirements or system architecture. We deliver technology that is efficient, durable and ultimately sustainable.

VITRONIC offers **customised solutions and concepts** that cover everything from financing, through to customer relationship management, toll enforcement and collection. They enable road charging based on time and distance, with the additional option of dynamically adapting them to the current traffic situation, as well as the mapping of many other key parameters.



## A WIDE RANGE OF TOLLING TECHNOLOGIES



Free-Flow Open Road Tolling

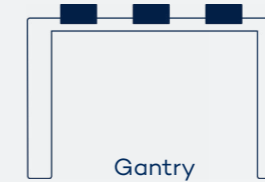


DSRC/RFID Tolling



GNSS Tolling

With free-flow open road tolling, traffic stays smooth and customers benefit from the minimal effort it requires. Vehicles are captured using camera systems – no matter if stationary, mobile or portable controlled for randomised enforcement.



Gantry



Roadside



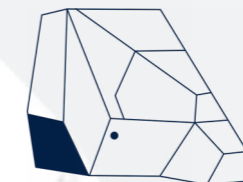
Pole

STATIONARY

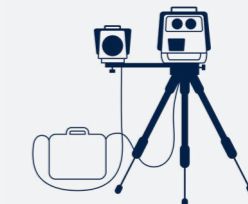


Vehicle & Enforcement bar

MOBILE



Trailer



Tripod

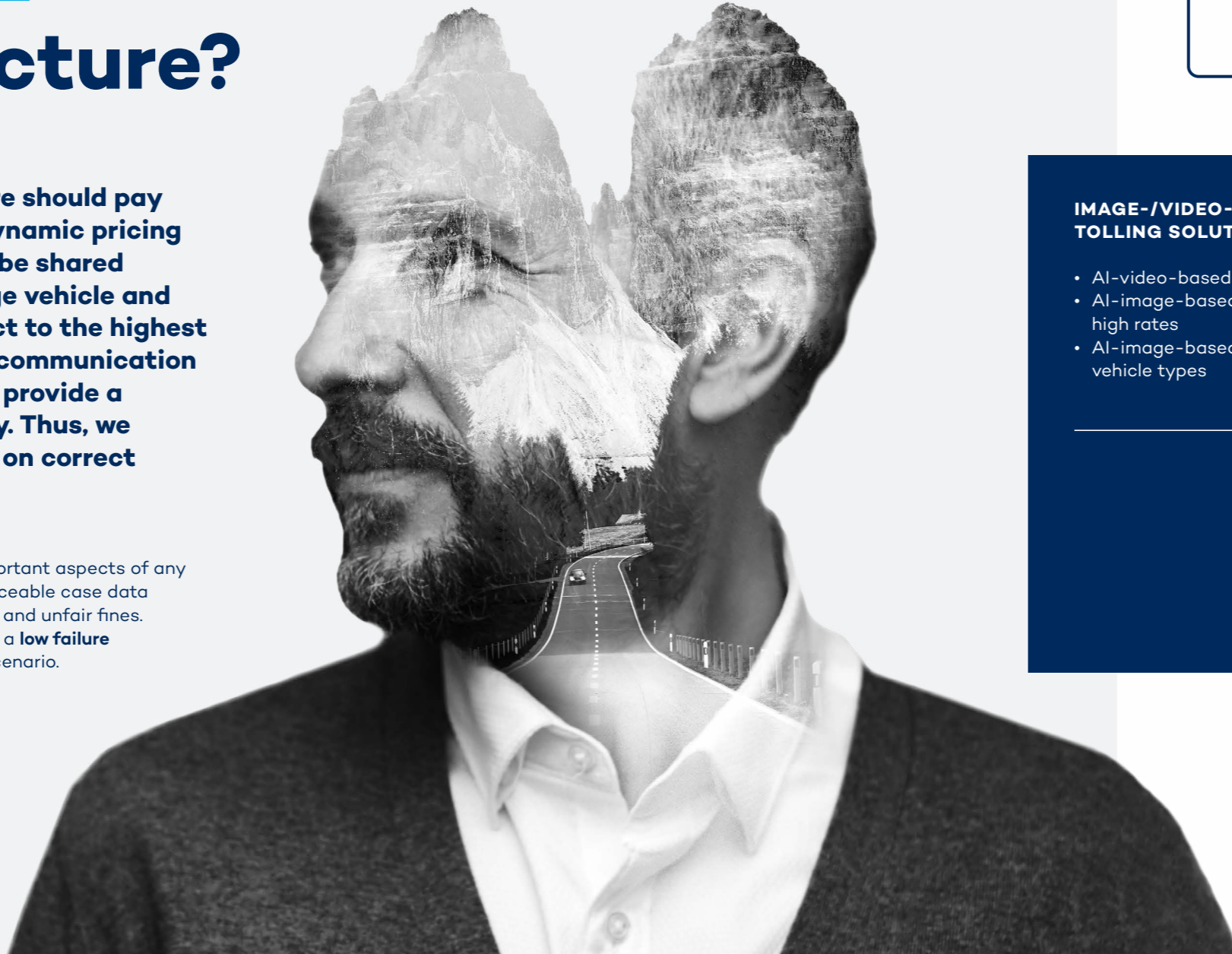
PORTABLE

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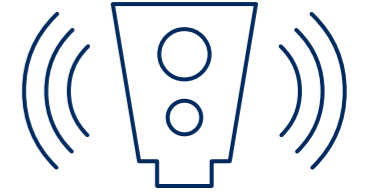
# Who **pays** for our infrastructure?

Those who use infrastructure should pay to maintain it. Tolling and dynamic pricing models allow these costs to be shared fairly. The processing of large vehicle and customer data sets is subject to the highest data protection and secure communication standards. At VITRONIC, we provide a high degree of data integrity. Thus, we ensure that pricing is based on correct and comprehensive data.

Data quality and data protection are important aspects of any toll system. Court-proof evidence and traceable case data management helps avoid miscalculations and unfair fines. Our solutions are highly **reliable** and show a **low failure rate** – no matter the use or application scenario.



We develop highly sensitive and high-performance cameras and sensors that provide our customers with the information they need to enforce and collect tolls.



## IMAGE-/VIDEO-BASED TOLLING SOLUTIONS

- AI-video-based detection
- AI-image-based identification with high rates
- AI-image-based classification for every vehicle type

## HARDWARE-TRIGGERED TOLLING SOLUTIONS

- High-performance laser vehicle detection
- Industry-leading identification rates
- Non-invasive 3D classification

## IMAGE-/VIDEO-BASED & HARDWARE-TRIGGERED TOLLING SOLUTIONS

- V2I communication with DSRC or RFID
- Extensive passage documentation
- Remote system monitoring and configuration
- Flexible deployment for all tolling

Our solutions feature highly secure processing standards that are 100% compliant with data protection regulations. VITRONIC technology enables a wide range of monitoring and application scenarios – from the establishment of environmental zones, to toll collection and enforcement, traffic volume measurement, average speed enforcement, identification of red light violations and the establishment of pedestrian safety applications.

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# How do we manage traffic smartly and efficiently?

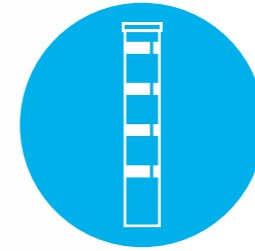
**We want to be your trusted partner - for a whole tolling life. We offer long-term relationships, durability and worldwide support.**

High-quality technology means low-maintenance technology, low operating costs and maximum efficiency. VITRONIC supports your tolling projects, from system installation right through to pre-adjudication processing. A high degree of automation in the detection and identification of vehicles ensures **smooth operation** without any intervention. This benefits your entire enforcement and charging business, which becomes **streamlined** and needs **fewer resources**. We offer a **full service** with global service points and certified partners.

This ensures that costs are proportionate, even in a constantly evolving environment with new traffic requirements.



## FULL SERVICE FOR TOLLING BUSINESS



### ROADSIDE UNIT

- Detection of various road users
- Classification of different classes of vehicles
- Identification of vehicles with ANPR
- Validation of DSRC communication ( $\mu$  wave, RFID)
- Passage report



### SOFTWARE/ CLOUD

- Real-time data transfer of secure files
- Real-time monitoring of various systems in parallel
- Automated import, export and semi-automated verification of cases
- Modern software architecture



### TOLL OPERATOR

- Full service with global service points and certified partners
- Easy service thanks to standardised, lightweight components
- Serviceable during running traffic
- Remote monitoring and sensor configuration
- Plug & play functions: configurable system for flexible adjustments



**For more information,  
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