EASING CITY TRAFFIC

cross®

cross-traffic.com

V2N

CLOUD
INFRASTRUCTURE

ON-BOARD UNIT
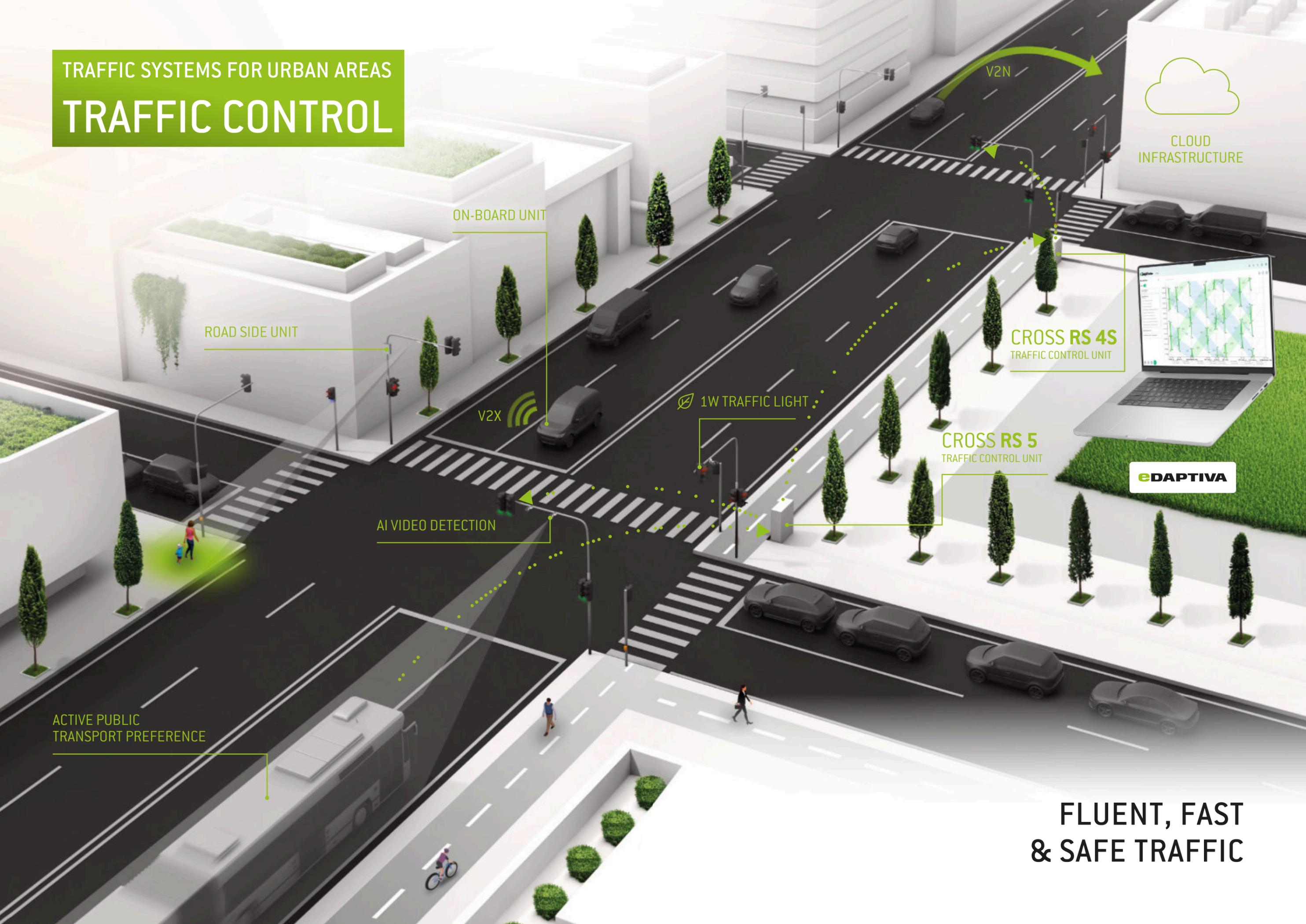
ROAD SIDE UNIT

CROSS **RS 4S**
TRAFFIC CONTROL UNIT

V2X

1W TRAFFIC LIGHT

CROSS **RS 5**
TRAFFIC CONTROL UNIT

eDAPTIVA

AI VIDEO DETECTION

ACTIVE PUBLIC
TRANSPORT PREFERENCE

FLUENT, FAST
& SAFE TRAFFIC

TRAFFIC LIGHT CONTROLLER
CROSS RS 5

TRAFFIC LIGHT CONTROLLER
CROSS RS 4S

ADAPTIVE TRAFFIC CONTROL SOLUTIONS FOR URBAN ENVIRONMENTS

TRAFFIC CONTROL

A city with good traffic flow is the dream of all its residents. None of us wants to spend time in traffic jams, stressing out over honking horns or breathing air full of exhaust fumes. We want cities with flexible and efficient traffic. We want our city to give us time for a happy life.

SMOOTH TRAFFIC WITHOUT STRESS

Do you want smooth traffic in your city? Where every traffic light doesn't mean red, where cars drive more than they stand still, and where buses and trams run smoothly through the city without delays? Demand transportation that can adapt to the situation on the roads, a system that can solve every traffic situation. Demand green.

SAVING MONEY AND TIME

Less time in traffic jams means more time for work, family, or leisure. Smooth-flowing roads mean lower fuel consumption, but also cheaper transport of goods, more economical public transport, and longer vehicle and road life. You will be able to invest the time saved on the roads more wisely.

LESS EMISSIONS, NOISE, AND DUST

It's a simple equation. Shorter driving times equal less gasoline and diesel fuel burned. Fewer starts mean fewer clouds of smoke and loud engines. Smooth driving eliminates emissions and noise and dust levels in the streets.

SATISFACTION IN A SAFE AND ATTRACTIVE CITY

Functional mobility in the city is the basis for a comfortable and pleasant place for a happy life. It's great to know that you can get to work, home, family, or entertainment easily, quickly, and safely. An attractive city means accessibility, comfort, and safety.

TRAFFIC ENGINEERING SERVICES

We combine traffic engineering expertise with modern technologies. From studies and capacity assessments to signal control, programming and simulations, we help cities design safe and efficient traffic solutions.

The **CROSS RS 5** model is the new flagship among traffic light controllers. Its design emphasises easy installation and servicing and reflects the latest standards in hardware and software design. The RS 5 controller offers the best solution for all sizes of installations.

- 7" LCD touchscreen
- Integrated web server
- Universal switch cards 24 VDC – 230 VAC
- Number of signal groups – max. 128
- Number of output circuits – max. 256
- Transport cores – CROSS, Lisa+, VS+ and the new eDita traffic core
- Support for communication protocols: OCIT-O V1.0, 2.0, 3.0; RSMP in the latest version; DIASER; NTCIP
- SIL 3 Certified
- Direct integration of advanced AI detectors
- Local adaptive control in the controller
- Number of predefined routes for emergency services – unlimited
- User interface 2 × RS 232, 1 × Ethernet, USB A, USB B 1 × RS485, GSM, GPS optional: opto-isolated RS 232, RS 485, DSL

The **CROSS RS 4S** is a compact traffic controller. It is designed for quick and easy installation and maintenance. It allows the connection of various types of peripherals and plug-in modules.

- 4.3" LCD touchscreen display
- Number of signal groups – max. 64
- Number of signal output circuits – max. 192
- Support for 24V DC, 42V AC, and 230V AC signal heads
- Traffic cores – CROSS, Lisa+, VS+
- Support for communication protocols: OCIT-O V1.0, 2.0, 3.0; RSMP in the latest version; DIASER; NTCIP
- Direct integration of advanced AI detectors
- Local adaptive control in the controller
- Preference for emergency vehicles
- RS 232, Ethernet, USB, GSM, GPS, 3G interfaces; optional opto-isolated RS 232, RS 485, and DSL

STANDARD ACCESSORIES

Detectors

- Pedestrian buttons, loop detectors, radars, magnetic detectors
- AI video detection systems with advanced outputs, e.g., O-D analysis
- Direct integration of all detectors from leading manufacturers with the traffic controller

Traffic preference devices*

- On-board units and additional vehicle devices
- Modems incorporated within controllers
- Full compatibility with V2X / C-ITS

* Typically for ambulances, fire engines, public transport, etc.

Certified signal heads

- Power supply options of 230 V, 40 V and 10 V AC, or 24 V DC at 1 W
- Low-consumption LED inserts

CONNECTING THE CONTROLLER TO INFRASTRUCTURE

V2X

CROSS traffic light controllers communicate and share information with the surrounding infrastructure for even smoother and safer traffic.
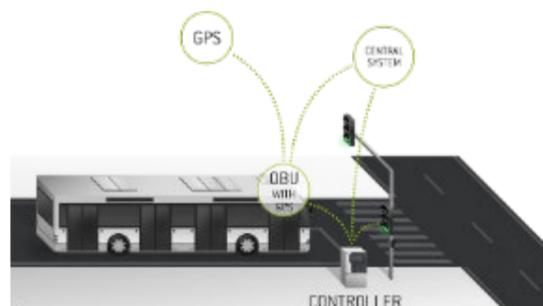

CROSS
RS 5

PUBLIC TRANSPORT PREFERENCE

CROSS systems enable public transport to be given priority at controlled traffic intersections. Data is transmitted between public transport vehicles and the traffic light controller, enabling the system to respond immediately to the presence of such a vehicle, e.g., by extending the green light for its smooth passage. Our controllers process signal plans in real time and respond immediately according to the current situation.

- Assigning priority to selected vehicles
- Setting preferences according to the hierarchy in the transport plan
- Minimisation of delays for all vehicles at intersections
- Optimising public transport coordination
- Eliminates static priority settings in situations where the vehicle is not yet at the intersection
- Provision of additional transport functions for public transport

PREFERENCE FOR EMERGENCY VEHICLES

CROSS controllers are capable of clearing routes for emergency vehicles based on received requests. These are typically ambulances or fire trucks.

CENTRALISED PT PREFERENCE

- Purely software solution: no additional hardware required in the controller
- Connection of any fleet system to the controller: emergency services and public transport vehicles, taxis, any other type of vehicle with GPS
- The priority level is freely configurable based on various parameters. For example: type of vehicle (emergency or public transport), vehicle ID, delay, number of passengers, rush hour, etc.

CROSS SOFTWARE

eDaptiva

This CROSS software package constitutes a comprehensive suite for configuring, remotely controlling and monitoring traffic controllers. It also supports traffic planning, the modelling of traffic situations, device supervision, traffic monitoring and adaptive control mechanisms.

The system is based on our eDita® (maintenance and programming software) and eDaptiva® products (a full-featured urban traffic management centre) that together comprise a mutually functioning platform. This solution is complemented by an add-on module eDaptiva® mobile.

Mobile application   Web browser

Traffic engineering   Data analysis

MAIN FEATURES

- Traffic engineering and programming of traffic light controllers
- Adaptive control and optimisation of traffic flow
- Online monitoring, remote management, and maintenance
- Centralised management in all modes
- Optional connection between controllers and surrounding V2X infrastructure
- Collection and evaluation of traffic data
- Connection via various protocols
- Cloud (SaaS) or on-premise solution

eDAPTIVA

eDaptiva® is a comprehensive traffic control centre. It is designed to meet the diverse requirements of small, medium, and large urban areas, enabling observation, supervision, and adaptive control. Basic system monitoring is possible via the eDaptiva® web client and is fully integrated with the Invipo smart city platform.

ADAPTIVE AND CENTRALISED TRAFFIC SIGNAL SYSTEM

CROSS has implemented a major project to modernise and maintain the adaptive and centralised traffic signal system in the city of Porto, one of the largest transport hubs in Portugal. The aim of the project was to fundamentally improve the level of urban traffic control, strengthen the adaptive functions of the signalling and create a modern, open platform enabling efficient traffic control across the growing metropolitan area of Porto.

The project included the comprehensive supply, installation, configuration and commissioning of up to 280 CROSS RS 4S adaptive controllers. These were integrated into the central traffic system eDaptiva, which manages adaptive functions, coordination and optimisation of traffic on an extensive network of intersections including V2X.

There will be total of 40 V2X RSU units for BRT / Metrobus preference implemented and 11 V2X RSU units for emergency vehicles.

A key technical element was the integration of all controllers using the open standardised OCIT-O v2.0 protocol, ensuring full interoperability between devices from different manufacturers. In specific locations, some controllers were also integrated via the DIASER

protocol, demonstrating the flexibility and openness of the CROSS platform. The project also included the delivery and implementation of a bus priority system on Avenida Fernão Magalhães, where 11 adaptive controllers with dedicated prioritisation logic were installed.

The first phase of the project was successfully completed in 2022, with the subsequent phase including the implementation of an additional 289 adaptive controllers into the existing central platform.

Customer evaluation confirms that the delivered technologies operate stably, reliably and provide excellent results in daily operations. Both the CROSS RS 4S controllers and the eDaptiva central system are working as expected and are making a significant contribution to the smooth flow of traffic in one of the most dynamically developing European cities.

This project is a prime example of how modern adaptive technologies and open standards can significantly improve urban mobility control, strengthen the efficiency of public transport and create a robust foundation for future Smart City initiatives. Porto today has one of the most modern traffic systems in Portugal – and CROSS is a proud partner in this success.
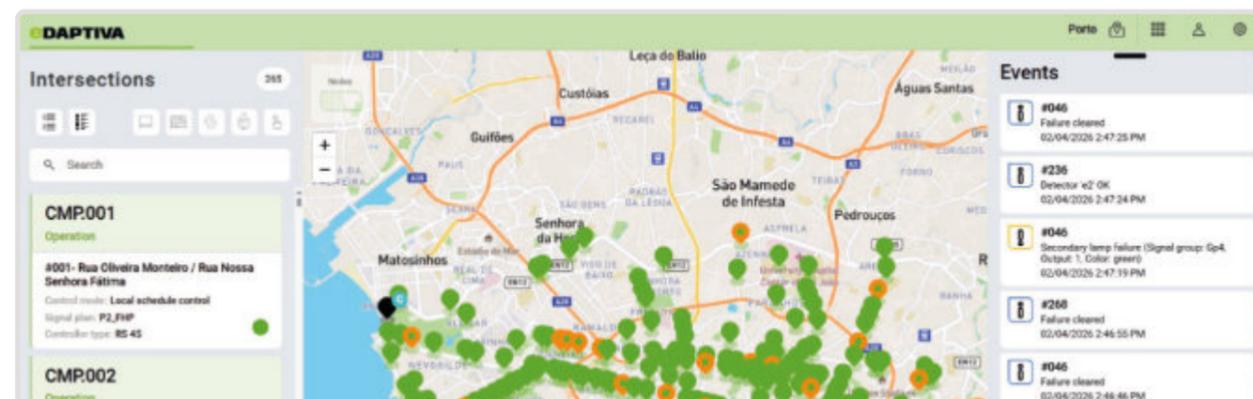
CENTRALISED SCADA SYSTEM

CROSS successfully implemented a modern centralised SCADA system for monitoring and controlling traffic lights in Denmark. The project was implemented for the Danish Road Directorate (DRD) and included the complete delivery of the software solution, its integration into the state IT infrastructure and subsequent operation in the SaaS model. The system is designed to reliably and long-term serve an extensive network of more than 350 traffic light controllers from various manufacturers (mainly Swarco and Stuhrenberg), making it one of the key elements of traffic management throughout the country.

The core of the delivered technology is the advanced SCADA solution eDaptiva, which provides a robust monitoring and control interface for traffic controllers. Users have both a map and list view of all intersections in real time, including immediate visualisation of fault conditions and operational events. The system also allows viewing historical data, signal plan behaviour and detailed information about detectors. The delivery includes support for full compatibility with the OCIT protocol, including the ability to record and distribute LISA+ signalling logic via the VD server.

A major advantage is the developed data analytics and advanced logging. eDaptiva provides comprehensive audit, system and interface logs that can be searched, filtered and exported to standard formats for further processing. Data from detectors, pedestrian buttons and other input-output devices comes to the system, which is then aggregated and visualised for detailed

technical analysis. Space-time diagrams are also available, which significantly facilitate the assessment of intersection coordination and support traffic engineering decisions.

The solution also includes tools for operational control – operators can run predefined commands, such as switching signal plans, restarting controllers or activating emergency states. The system supports the configuration of logical scenarios that are automatically triggered based on detection events, for example, during congestion or incidents.

The project consistently reflected the requirements for interoperability. SCADA supports full integration according to OCIT-O 3.0 and OCIT-C and communicates with a wide range of controller manufacturers. User identity is managed via the customer's Identity Provider, including Azure AD support. The interface is accessible from both computers and mobile devices and fully localised into English.

Connectivity with the state data platform is ensured via REST API. This allows sending priority requests and exporting dynamic and historical data to external analytical systems, opening up space for further optimisation of traffic.

The project was completed on time, met all technical and contractual requirements and significantly contributed to the digitisation of traffic management in Denmark.

350+
CONTROLLERS FROM VARIOUS MANUFACTURERS

✓ **Multi-vendor environment**

✓ **Nationwide control and monitoring system running in cloud (SaaS)**

✓ **Communication via OCIT-O and OCIT-C**

✓ **Interoperability with external Data Exchanger platform**

SOLUTION FOR TRAFFIC CONTROL

CROSS systems help control traffic on all continents. In cities, on intersections crosswalks, and roads, they adapt to local climatic and traffic conditions and make roads safer and easier to navigate. They also give priority to public transport vehicles and the integrated emergency system.

REFERENCES

More references

Aarhus, Denmark
Traffic control system

Izmir, Turkey
Fully equipped traffic control centre

Muscat, Oman
Decentralised traffic control

Prague, Czech Republic
Traffic control system with priority for public transport

Ulm, Germany
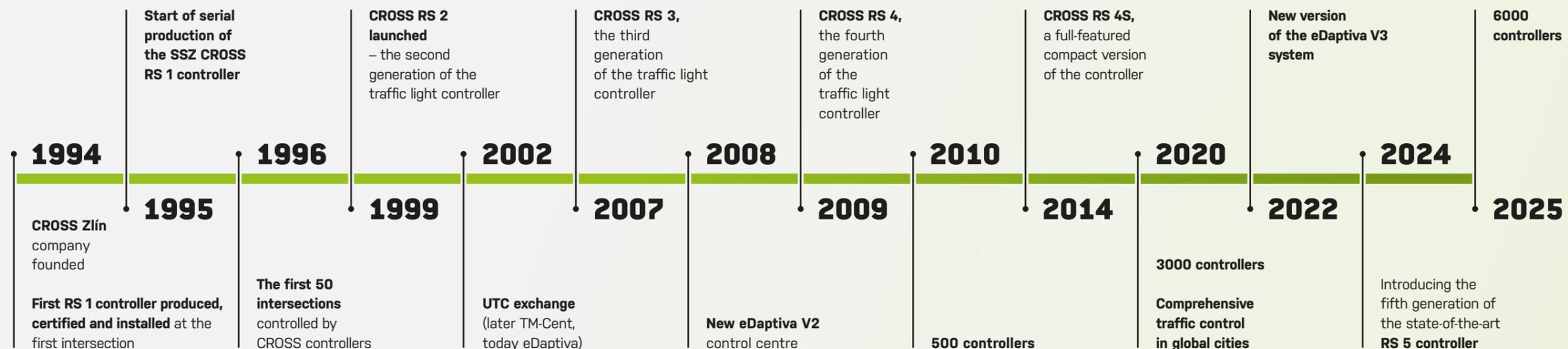Traffic control system with priority for public transport

Sofia, Bulgaria
Traffic control system with priority for public transport and emergency vehicles

DEPARTMENT MILESTONES

1994

CROSS Zlín company founded

First RS 1 controller produced, certified and installed at the first intersection

1995

Start of serial production of the SSZ CROSS RS 1 controller

1996

The first 50 intersections controlled by CROSS controllers

1999

CROSS RS 2 launched – the second generation of the traffic light controller

2002

UTC exchange (later TM-Cent, today eDaptiva)

2007

CROSS RS 3, the third generation of the traffic light controller

2008

New eDaptiva V2 control centre

2009

CROSS RS 4, the fourth generation of the traffic light controller

2010

2014

500 controllers

CROSS RS 4S, a full-featured compact version of the controller

2020

2022

3000 controllers

Comprehensive traffic control in global cities

New version of the eDaptiva V3 system

2024

Introducing the fifth generation of the state-of-the-art **RS 5 controller**

6000 controllers

2025

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