



TRAFFIC CONTROL

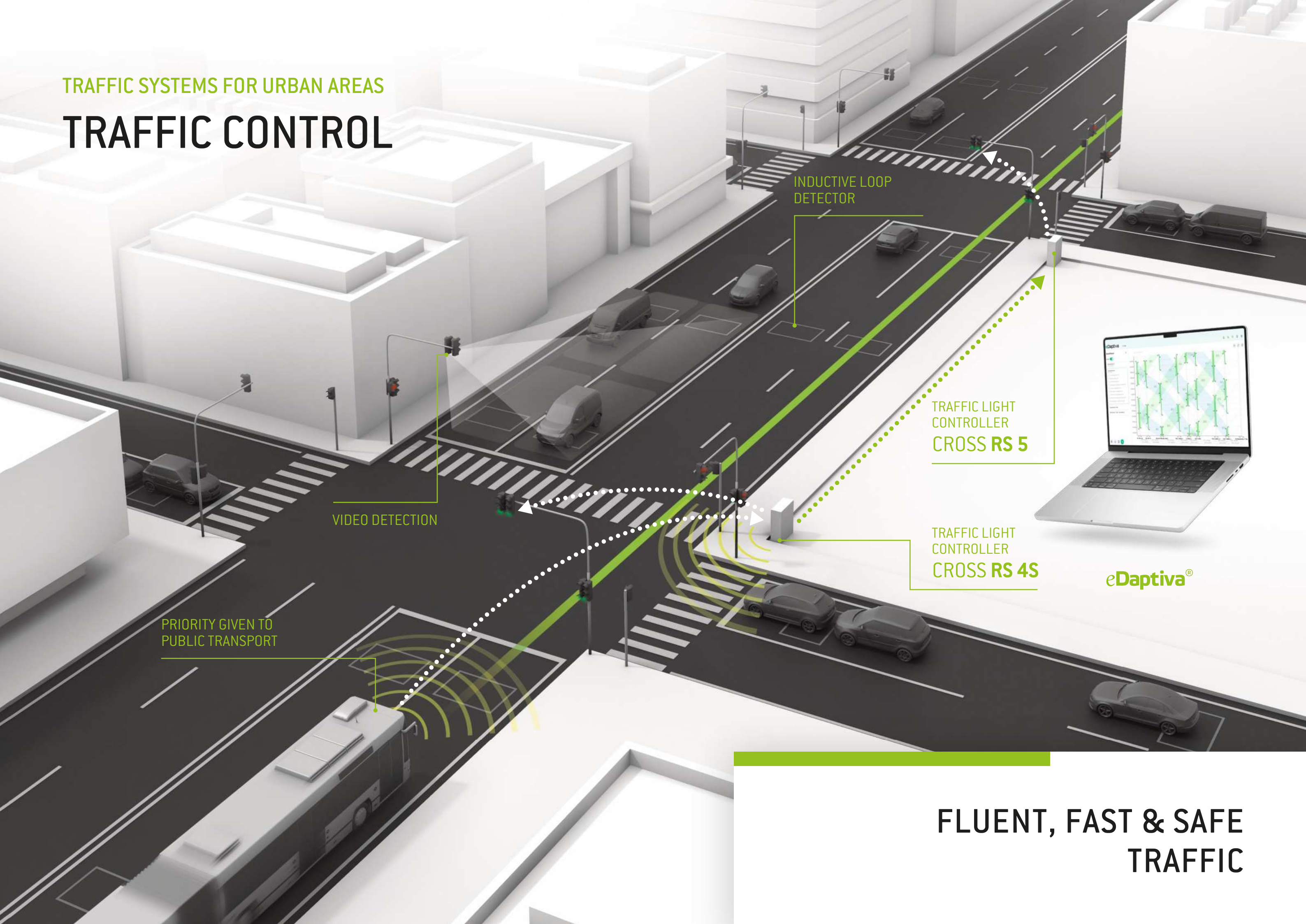


EASING CITY  
TRAFFIC



TRAFFIC SYSTEMS FOR URBAN AREAS

# TRAFFIC CONTROL



PRIORITY GIVEN TO PUBLIC TRANSPORT

VIDEO DETECTION

INDUCTIVE LOOP DETECTOR

TRAFFIC LIGHT CONTROLLER CROSS RS 5

TRAFFIC LIGHT CONTROLLER CROSS RS 4S

eDaptiva®


FLUENT, FAST & SAFE TRAFFIC




ADAPTIVE TRAFFIC CONTROL SOLUTIONS  
FOR URBAN ENVIRONMENTS

# TRAFFIC CONTROL


Unhindered travel throughout the city is the desire of every inhabitant. A pleasant, liberating urban environment is one free of gridlock, without unnecessary pollution from stationary vehicles, where traffic flows smoothly and noise is minimized.

 **Fluent, stress-free transport**


Get the green light to freely flowing city traffic. No longer do cars and buses need to stop for red at every intersection, instead their movement is governed by a system capable of handling any situation.

 **Reduced emissions, less noise and dust**

Urban streets can be cleaner and quieter – it is simply a matter of keeping vehicles moving. As a result, engines rev less, cutting down on emissions from exhausts and reducing the dust in the air.

 **Save money and time**

Eliminating gridlock has numerous benefits. Residents spend their time more fruitfully, cars run efficiently, delivering goods is cheaper, public transport functions as it should and road repairs are reduced.

 **Live well in safe, pleasant cities**

Accessibility, comfort and safety represent the hallmarks of an attractive city. Everyone is sure to appreciate an environment where commuting and going out are simple, quick and safe activities.

TRAFFIC LIGHT  
CONTROLLER  
CROSS RS 4S



The CROSS RS 4S is a smaller and more compact version of the RS 4 traffic controller. It processes fewer inputs and is specially designed for quick and easy installation. It has the capacity to connect with various peripherals and plug-in modules.

- Maximum of 64 different signal groups
- Maximum of 192 signal head outputs
- Monitoring of each signal head output
- Maximum of 128 loop detectors
- Maximum of 200 external inputs
- Maximum of 72 push button units for pedestrians
- Maximum of 68 signal plan frameworks
- Application of up to 16 stages within every signal plan
- Priority given to emergency services across 13 preset routes
- Facilitates manual control of 6 all-red stages
- Interface via RS 232, Ethernet, USB, GSM, GPS, 3G; options for opto-isolated RS 232, RS 485 and DSL
- 4.3" LCD touch screen

TRAFFIC LIGHT  
CONTROLLER  
CROSS RS 5



The CROSS RS 5 model is the new flagship among light signaling controllers. The construction emphasizes simple installation and service and reflects the most modern standards in the field of HW and SW design. The RS5 controller offers the best solution for all installation sizes.

- Number of signal groups - max. 128
- Number of output circuits - max. 256
- Output circuit monitoring - each output circuit
- Number of induction loops of internal detectors - max. 128
- Number of usable external inputs - max. 376
- Number of usable external outputs - max. 128
- Number of signal plans – unlimited
- Number of traffic phases in each signaling plan – unlimited
- Number of predefined routes for emergency vehicles – unlimited
- User interface 2xRS 232, 1x Ethernet, USB A, USB B 1xRS485, GSM, GPS optional: opto-isolated RS 232, RS 485, DSL
- 7" LCD touch screen

**CROSS Traffic Light Controllers of the 5th generation**

- Scheduling and control of fixed signal plans
- Scheduling and control of dynamic signal plans
- Traffic adaptive control
- Priority given to public transport
- Adheres with requirements of EN 50556, EN 12675
- Safety integrity level SIL3

## STANDARD ACCESSORIES

### Detectors

- Pedestrian push button units
- Loop detectors
- Video detection systems
- Wireless magnetic detectors
- Radars

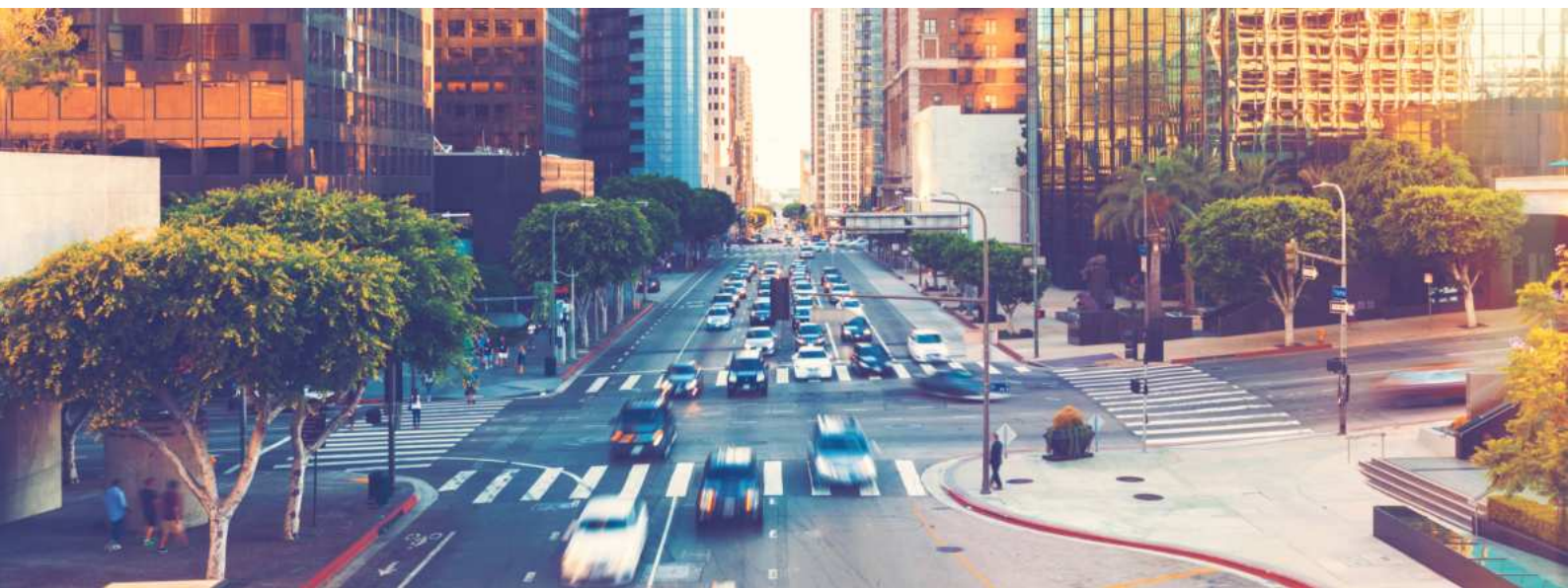
### Certified Signal Heads

- Power supply options of 230 V, 40 V and 10 V AC, or 24 V DC at 1 W
- Lamps: Incandescent bulbs or LEDs

### Equipment for traffic priority\*

- On-board units and additional vehicle devices
- Modems incorporated within controllers

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



## LINKING TRAFFIC LIGHTS TO INFRASTRUCTURE

# V2X

CROSS traffic light controllers communicate and exchange information with infrastructure, facilitating maximum efficiency and security.



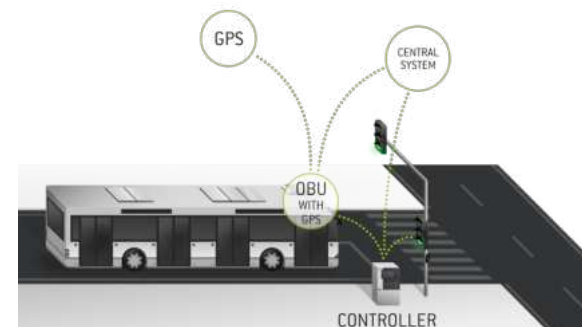
## PRIORITY GIVEN TO PUBLIC TRANSPORT

CROSS systems enable the preferential treatment of public transport at intersections under traffic light control. Data is transferred between such vehicles and the traffic light controller, meaning they run more fluently but without restricting the flow of other automobiles. Our controllers handle signal plans in real time and assign preference as required, minimizing risk of delay at busy times.

- Assignment of priority for selected vehicles
- Settings for preferences in accordance with plans for local traffic hierarchies
- Minimizes delay for all vehicles at intersections
- Optimizes the coordination of public transport
- Preference only given to vehicles physically present on roads
- Creation of isolated branches given over to the passage of public transport
- Provision of additional traffic functions for public transport

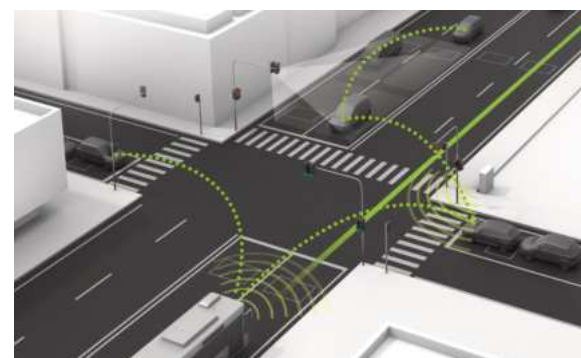
## INVIPO - CENTRAL PREFERENCES

- Pure software solution: no need for additional hardware in the controller
- Connection of any fleet system to the controller: emergency and public transport vehicles, taxis and 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.



## ABSOLUTE PRIORITY FOR EMERGENCY VEHICLES

CROSS traffic light controllers are able to forcibly designate green lights in a given direction on command for ambulances and fire engines.



## 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 CROSS PTC (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.



eDaptiva®



Mobile application



Web browser



Traffic engineering



Data analysis



## KEY FEATURES

- Traffic engineering and programming of traffic light controllers
- On-line monitoring, remote administration and maintenance
- Centralized management in all modes
- Optional interconnection between traffic light controllers and surrounding infrastructure V2X
- Traffic data collection and evaluation
- Connectivity via different protocols

eDaptiva® is an extensive urban traffic management centre. Designed to meet the various demands of small, medium and large urban areas, it permits observation, supervision and adaptive control. Basic system monitoring is made possible via the eDaptiva® thin client and it is fully integrated with Smart City platform Invipto.



UNIQUE PROJECT  
IN THE CZECH REPUBLIC

# INTELLIGENT TRANSPORT SYSTEM IN HRADEC KRÁLOVÉ



If you are looking for the most up-to-date set of technologies for traffic control used in one project, then focus on the project implemented by us in Hradec Králové. This is the best example of connecting a traffic control system with traffic counters based on advanced video detection, violation systems and data sharing through the V2X interface.

We delivered the latest development generation of the CROSS RS 4S controller to Hradec Králové. The controller communicates directly with the CROSS eDaptiva center using the European standardized open protocol OCIT. A C2X Road Side Unit (RSU) communicating on the ITS G5 standard is connected to each light signaling controller. C-ITS systems use data generated during the driving of currently produced vehicles, which these vehicles exchange not only with each other, but also with the surrounding infrastructure. The exchange of vehicle data is the basic idea of cooperative intelligent transport systems (C-ITS), where it is the fastest way to

express information to the driver quickly, reliably and intelligibly. The C2X system (possibly also referred to as V2X) is used as part of public transport priority and for the preference of emergency vehicles, as well as for informing drivers about possible traffic problems such as a pedestrian at an intersection, a traffic queue, a car in the opposite direction and others.

The complexity of the system is underscored by the installation of overview cameras with an advanced detection engine for counting and classifying traffic, directional analysis, detection of possible problems in traffic, and analysis of the speed of the traffic stream. As for infringement systems, the project includes 4 section speed measurement systems, 6 radars for instantaneous speed measurement and 2 red light crossing detection. Furthermore, the system also included the application of the LoRaWAN network, especially for the analysis of electricity consumption within transport infrastructure systems.

All the mentioned systems are combined into the smart city integration platform Invipo, which not only offers a web interface for the entire intelligent transport system, but also enables the integration of other city technologies into one unit. This platform stands on three basic pillars. These are data and integration, interoperability and smart scenarios, and presentation and open data. As part of this unique project, the integration of such a large number of systems into one platform makes it possible to search for a new context among the obtained data and maximize the efficiency of traffic control in the city of Hradec Králové.



CENTRAL MONITORING AND  
CONTROL SYSTEM IN DENMARK

# CASE STUDY



We can adapt traffic control systems to the needs of each city. We have always strived to be at the forefront of the development and implementation of innovative technologies. We improve conditions for road transport using the latest technologies. The Danish city of Esbjerg is also an example of this.

In the city of Esbjerg, we realized the very first ITS order of this kind in Denmark, including traffic light controllers, software for setting and management, as well as a control center for traffic monitoring and adaptive control of eDaptive traffic and a smart city platform for the administration and management of other smart devices of the transport infrastructure. In this project, the traffic control center combines the connection of light signaling controllers of 4 manufacturers and 5 types of controllers using the OCIT protocol with the connection of other devices using other protocols in a single interface. A really smart approach!

The project includes the delivery of the eDaptiva monitoring and control software platform. It connects 5 types of controllers from different manufacturers using the OCIT protocol and enables their effective management, such as regional control logic, activation of intervention routes or special plans for exceptional traffic situations.

CROSS systems in Esbjerg enable a central preference for urban public transport. Data is transmitted between public transport vehicles and the eDaptiva central control platform. It then



transmits commands directly to the traffic light controller via the OCIT 3.0 protocol and enables the system to react immediately to the presence of such a vehicle, e.g. to extend the green light for its smooth passage.

Another pillar of the Danish installation is the commissioning of the parking navigation system, which, thanks to the use of variable guidance signs, will help to easily find your way around parking lots and in parking garages. The project also integrates devices such as traffic counters, bicycle traffic counters, speed measurement, and also controls access to pedestrian or residential zones using retractable posts (so-called bollards). These functions are available from the smart city environment of the Invipo platform, which makes it possible to find a new context across the installed technologies in the city.

CROSS

# TRAFFIC MANAGEMENT SOLUTIONS



# REFERENCES

Other references



CROSS has implemented traffic management solutions in countries across the globe. Tailored to suit the particular needs of a city, such a system includes tools to control individual intersections or automatically regulate traffic

flow to match the given conditions. Routes are freed up to allow emergency vehicles to pass unhindered, and prioritizing public transport becomes an option.



### Aarhus, Denmark

Traffic management system



### Izmir, Turkey

Fully equipped traffic control centre



### Muscat, Oman

Decentralized traffic control



### Prague, Czech Republic

Traffic management system with priority for public transport



### Ulm, Germany

Traffic management system with priority for public transport



### Sofia, Bulgaria

Traffic management system with priority for public transport and emergency vehicles



### Wallonia, Belgium

Traffic management system



### Niterói, Brazil

Traffic management system





**CROSS Zlín**

**Tel.: +420 577 110 211**

**E-mail: [info@cross.cz](mailto:info@cross.cz)**



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European Regional Development Fund  
Operational Programme Enterprise  
and Innovations for Competitiveness

**[www.cross-traffic.com](http://www.cross-traffic.com)**

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