



ROAD WEATHER



EVEN  
BAD WEATHER  
WILL NOT STOP YOU

**cross**<sup>®</sup>



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

SYSTEM TO SUPPORT EFFECTIVE WINTER MAINTENANCE

# ROAD WEATHER

**METIS5**

ROAD SURFACE  
TEMPERATURE AND  
STATE SENSORS

MOBILE / VEHICLE SENSORS

REMOTE ROAD SURFACE STATE AND  
TEMPERATURE SENSOR

WIND SPEED AND  
DIRECTION SENSOR

OVERVIEW CAMERA(S)

AIR TEMPERATURE,  
HUMIDITY AND  
PRESSURE SENSOR

VISIBILITY AND  
PRECIPITATION  
SENSOR

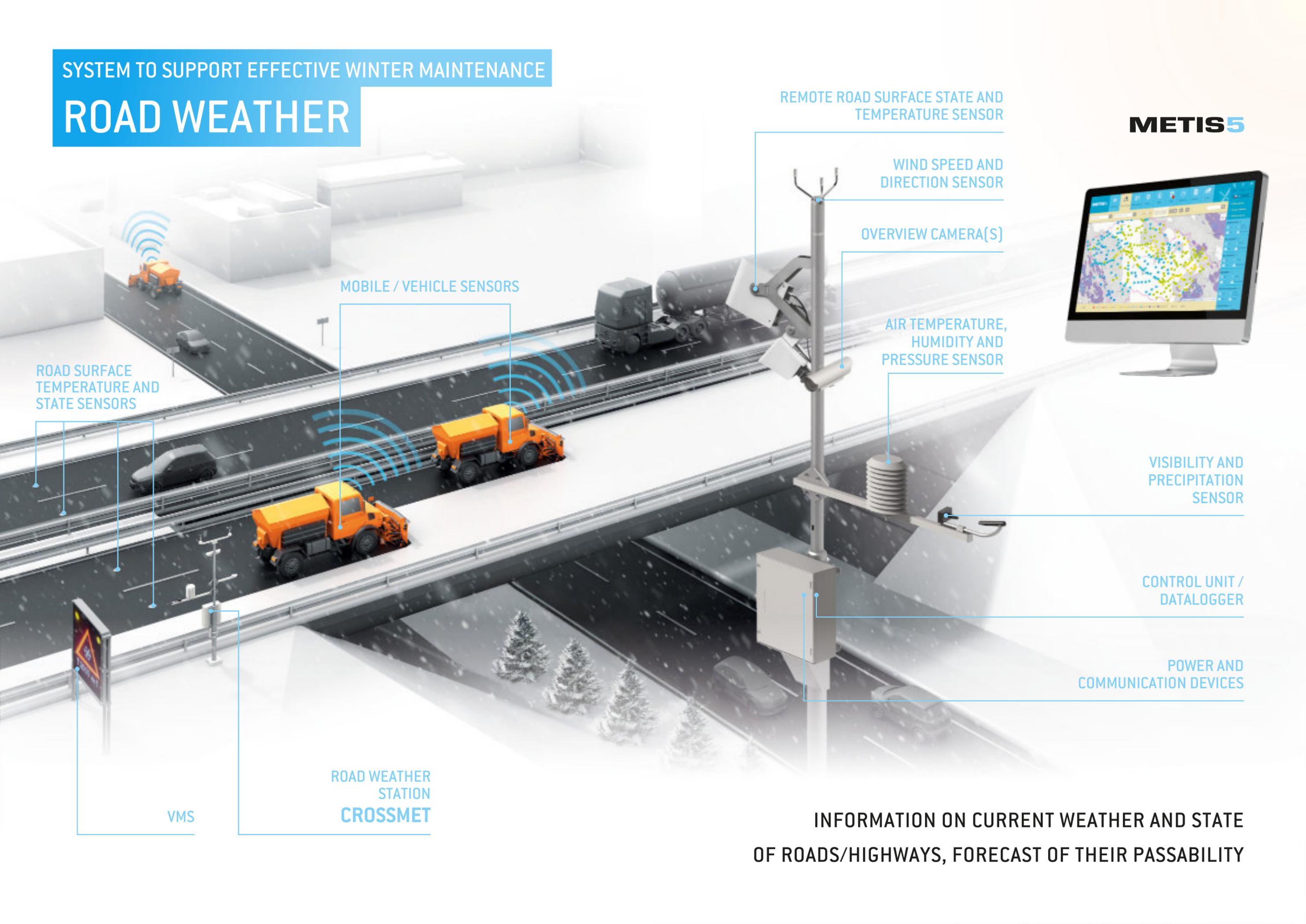
CONTROL UNIT /  
DATALOGGER

POWER AND  
COMMUNICATION DEVICES

VMS

ROAD WEATHER  
STATION  
**CROSSMET**

INFORMATION ON CURRENT WEATHER AND STATE  
OF ROADS/HIGHWAYS, FORECAST OF THEIR PASSABILITY



WINTER MAINTENANCE UNDER CONTROL

# ROAD WEATHER

The challenge we face every year is to maintain the road network passability even in difficult winter conditions. The road weather system monitors the condition of the road surface, informs road managers about problem areas and recommends necessary measures. Investments in this system increase safety while saving time and money.



**SAFER ROADS  
IN ANY SEASON**

When it comes to icy conditions, heavy snowfall or drifts, quick and effective action is essential. In addition to a detailed overview of the current weather situation on the roads, our weather system also provides accurate forecasts and recommendations, so you can stay one step ahead of the weather.



**COST SAVINGS  
FOR WINTER MAINTENANCE**

Monitoring winter maintenance performance and evaluating its adequacy significantly contributes to reducing excessive material consumption and inefficient or unnecessary interventions. Thanks to accurate information, maintenance performance can be planned more accurately and efficiently, and the subsequent financial analysis keeps the relevant costs under control.



**SUPPORTING  
THE RIGHT DECISIONS**

It is crucial for dispatchers to have an overview of the current traffic conditions of the roads they manage, as well as what the weather will bring in the coming hours. Thanks to data from weather stations, a professional numerical model and winter maintenance vehicles, they have all the information they need to make quick and easy decisions.



**NO MORE UNPLEASANT  
SURPRISES BEHIND THE WHEEL**

In addition to supporting winter maintenance, we also do not forget about direct road users. We provide drivers with important information through variable message signs at critical locations, or specialised web portals.

ROAD WEATHER STATION

# CROSSMET



## CROSSMET V4

The CrossMet road weather station control unit is an open platform that allows the connection of meteorological sensors and VMS. It works as a universal data logger that processes and transmits data. Its rich set of features ranks it among the top products in its category.

## KEY FEATURES

- Communication via GPRS/LTE/5G, TCP/IP, special emergency lines (SOS) or fiber optics cable
- Communication interfaces enabling, among other things, the control of variable message signs
- Versions supporting power supply from public lighting, solar panels, wind turbines or other alternative energy sources are also available
- Local and remote configuration and monitoring using API or web interface

The CrossMet road weather station is the primary source of information for the road meteorology system. The flexibility provided by the concept of the control unit and the possibility of connecting multiple sensors and other devices is a prerequisite for meeting a wide range of customer requirements.



## COMING SOON

- New generation (2026)
- SW compatible with CrossMet V4
- Modular design
- WiFi service interface
- GSM module
- More interfaces for connecting sensors and VMS
- Configurable inputs and outputs

- Road temperature and state
- Air temperature, humidity, dew point
- Precipitation
- Visibility and present weather conditions
- Wind speed and direction
- Surveillance camera with night vision



Full control using API

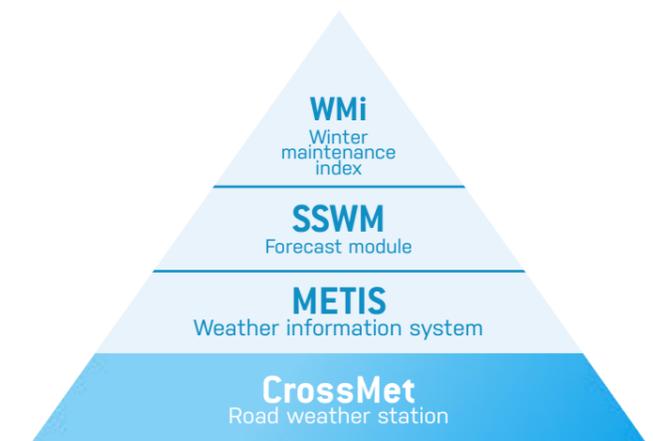


Low power consumption



Compatible with many third-party sensors

For road weather applications CROSS offers a robust system based on a network of weather stations connected to the METIS information system. METIS then provides current data on weather conditions on the roads, as well as short-term forecasts, warnings and recommendations. As an additional service, an assessment of the adequacy of winter maintenance is available.

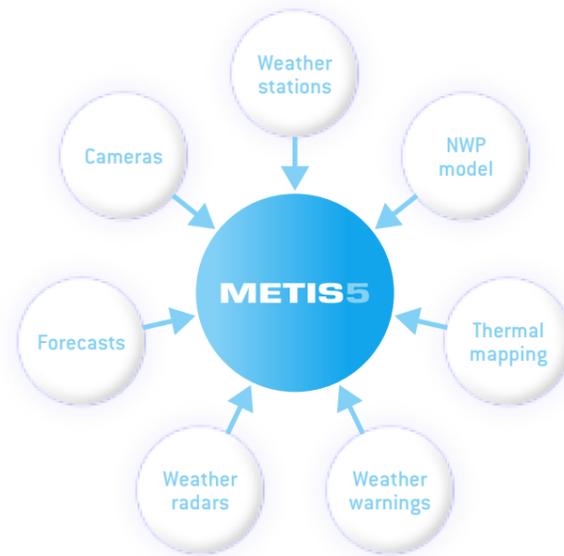


# METIS

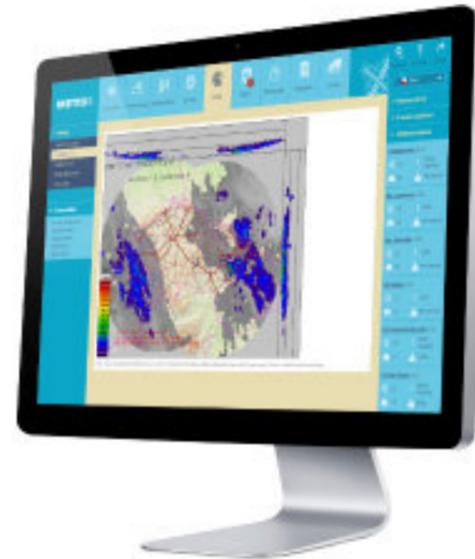
**METIS is a unique online information system designed for the collection, processing and presentation of meteorological data and other information with a focus on the current and future situation on the roads. It provides a comprehensive overview of the weather in real time.**



Currently, the 5th generation of the METIS system is available with many improvements and useful functions. The key feature remains the status map displaying a large amount of meteorological data that helps spatial perception of weather-related trends. Users can also use a clearly arranged dashboard, interactive graphs of measured data and various forecast products. It also displays images from overview cameras at weather stations and, newly, also allows operators to monitor and control variable message signs. If users are interested, METIS can be supplemented with other specialised modules that provide additional information and increase its service value.



 Dashboard	 Status map	 Weather stations
 Cameras	 Radar	 VMS



## ROAD WEATHER FORECASTING MODULE

# SSWM

**SSWM is a system for predicting the state and temperature of road surfaces. It utilises a sophisticated forecasting engine and a unique GIS spatial approach to forecast for each road section, enabling selective maintenance. In addition, it provides a recommended maintenance scenario for each maintenance area, including the amount of salt needed.**



 Aids informed decision-making	 Increases road safety	 Minimises expenditure	 12 hours forecast
--	--	--	--

## KEY FEATURES

- Integration of all relevant data sources
- Updated every hour
- Prediction of road state – dry, wet, snow, snow drifts, frost, ice
- Resolution for every 1 km of the road network
- Field-proven, precise predictions
- Recommended treatments to be applied by road maintenance operators
- Convenient implementation on new road networks
- Use of maintenance data and thermal mapping
- Direct integration with METIS



## ANALYSIS OF WINTER MAINTENANCE AND COSTS

# WMi

WMi helps streamline winter maintenance costs. It evaluates expected maintenance performance based on set criteria and compares it with reality.



## EVALUATION

- Visualisation, validation and reporting of data
- Evaluates the adequacy of winter maintenance and efficacy of expended costs
- Automatic invoicing module



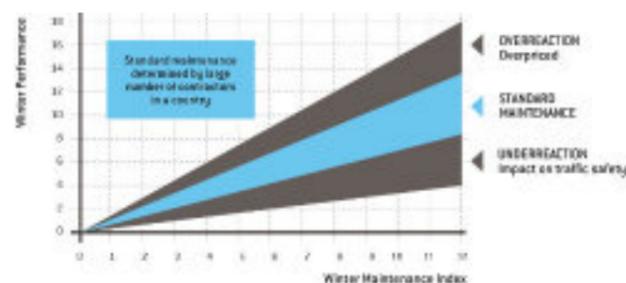
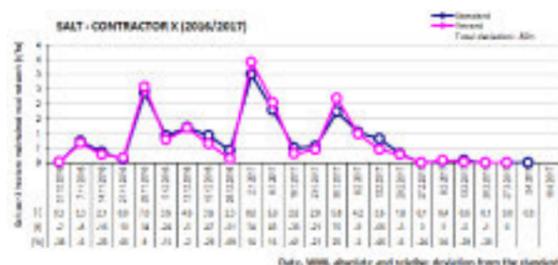
Performance reporting



Performance and adequacy check



Financial controlling



## A REVOLUTIONARY BREAKTHROUGH

# 2DRoad



Through an exclusive agreement with the MetSense company, CROSS has been granted the right to install and operate an innovative, technologically advanced road weather camera called 2DRoad, which, compared to competing products, allows for more comprehensive monitoring of current state of the road surface.

2DRoad is a unique sensor that provides detailed information about the condition of the road surface. Unlike other non-invasive sensors that focus on only one point or a small area of the road, 2DRoad is capable of simultaneously monitoring 4,096 points in an area up to 6 × 6 m. For each of these points, it can determine whether the spot is dry, wet or covered in snow or ice. The road surface temperature is measured at a point approximately in the middle of the sensed area.



Road weather camera



Road scanning in 2D



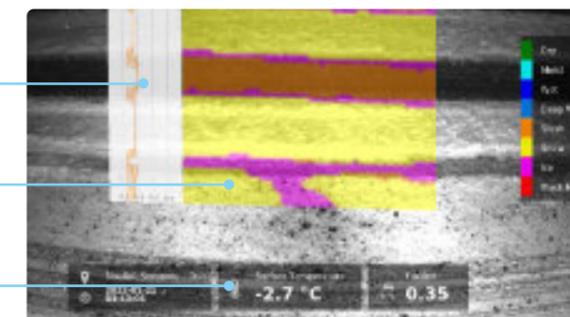
8 road surface conditions



Friction

Road surface state

Road surface temperature



## COMPLEXITY OF WINTER MAINTENANCE

- Use of road weather and professional climate stations
- Monitors snowfall, snow drifts, temperature, humidity (frost and ice)
- Standardised to cells of 100 × 100 m
- Takes geographical conditions into consideration (altitude, land use, etc.)

## WINTER CONDITIONS VS. PERFORMANCE OF TASKS

- Statistical analysis for comparison over the long term
- Independent of location, climate and extent of a road network by different contractors
- Stipulates the standards to be met for specific winter conditions
- Reveals deviation from standardised maintenance requirements

## MOBILE ROAD SURFACE SENSOR

MetSense | [metsense.com](https://metsense.com)

# MetRoad Mobile

MetRoad Mobile is a mobile laser sensor for monitoring road surface state. It can distinguish 7 conditions (dry, damp, wet, deep water, slush, snow, ice) and can calculate the height of the water layer on the road and the grip between the wheels of the vehicles and the road. An essential accessory of the sensor is a data logger with LTE connectivity and an adjustable mounting bracket.



ROAD WEATHER SYSTEM  
IN THE CZECH REPUBLIC

# CASE STUDY



The Czech Republic has been systematically building a network of road weather stations since the mid-1990s.

Currently, there are almost 800 weather stations installed along the road network in the Czech Republic and this number is constantly growing. All weather stations are integrated into the METIS system, which facilitates the monitoring of more than 55,000 km of roads throughout the country.

The METIS software and the SSWM forecasting module are used for this purpose by both the national road administrator (Directorate of Roads and Motorways) and a number of other entities – regions, cities or private companies (e.g. technical services).



SELECTED

# REFERENCES



More references



**Czech Republic**

National road weather system



**Central Bohemian Region (13 locations)**

2DRoad weather cameras deployed throughout the region



**Regional RWS systems (Slovakia)**

Growing number of RWS covering regional road network



**Bulgaria**

Establishing an RWS network



**Moldova**

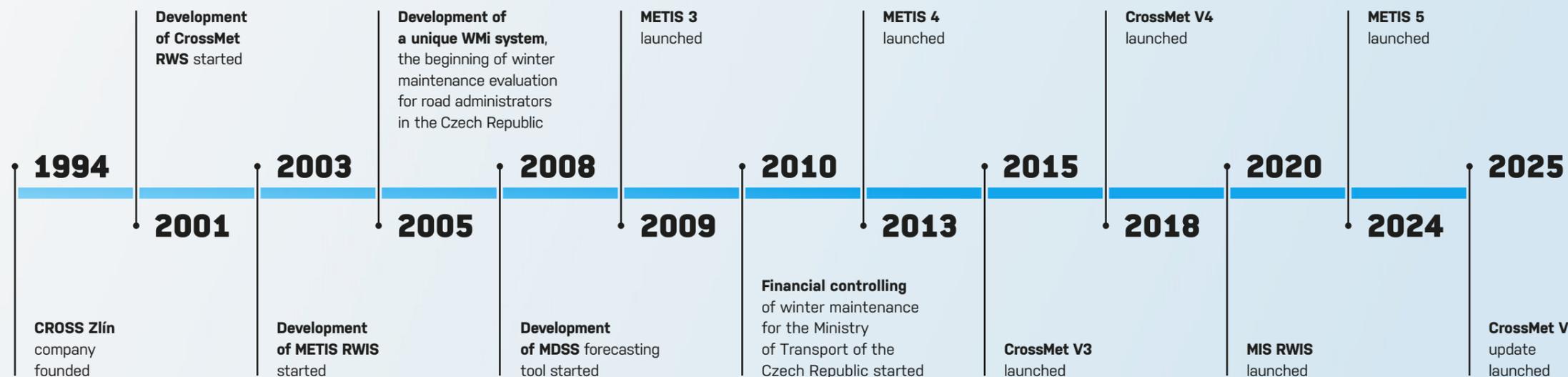
Network of weather stations at key points on the motorway and road network

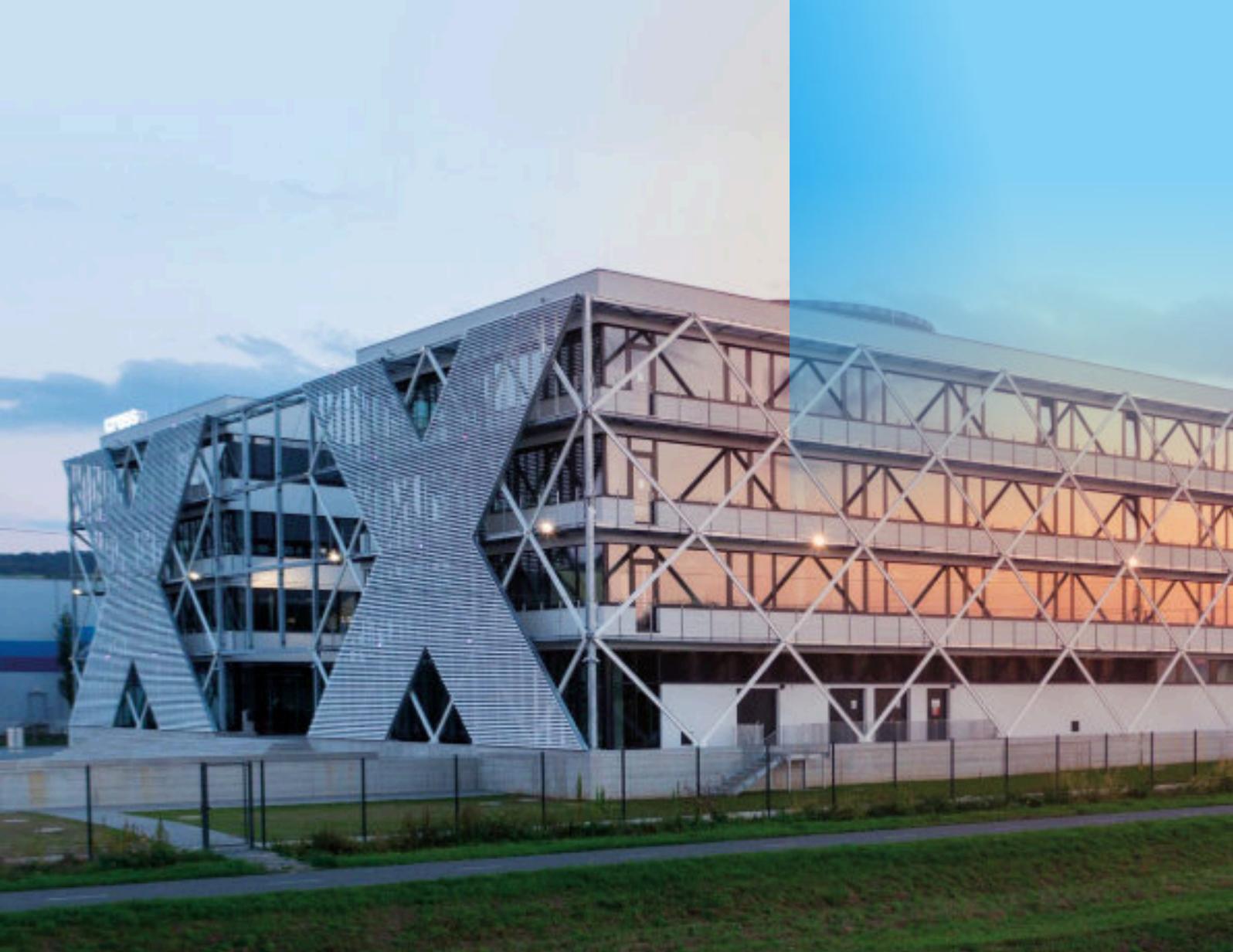


**Car test facility (Sweden)**

RWS providing vital meteo information via VMS & SW app

## DEPARTMENT MILESTONES





CROSS Zlín, a.s.  
Průmyslová 1395  
763 02 Zlín-Malenovice  
Czech Republic

Tel.: +420 577 110 211  
Email: [info@cross.cz](mailto:info@cross.cz)  
Web: [www.cross-traffic.com](http://www.cross-traffic.com)



LinkedIn profile



Co-funded by  
the European Union