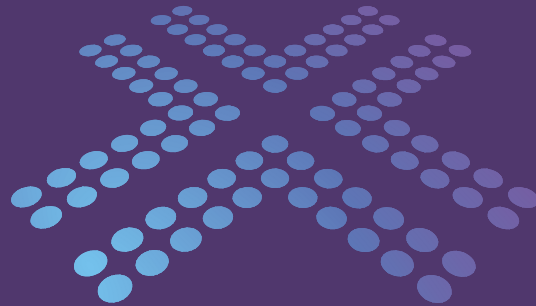


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Road Traffic Technology

Advanced Road Weather and Maintenance Information System in the Czech Republic

David KONECNY, Libor SUSIL, Jan SLEZAK

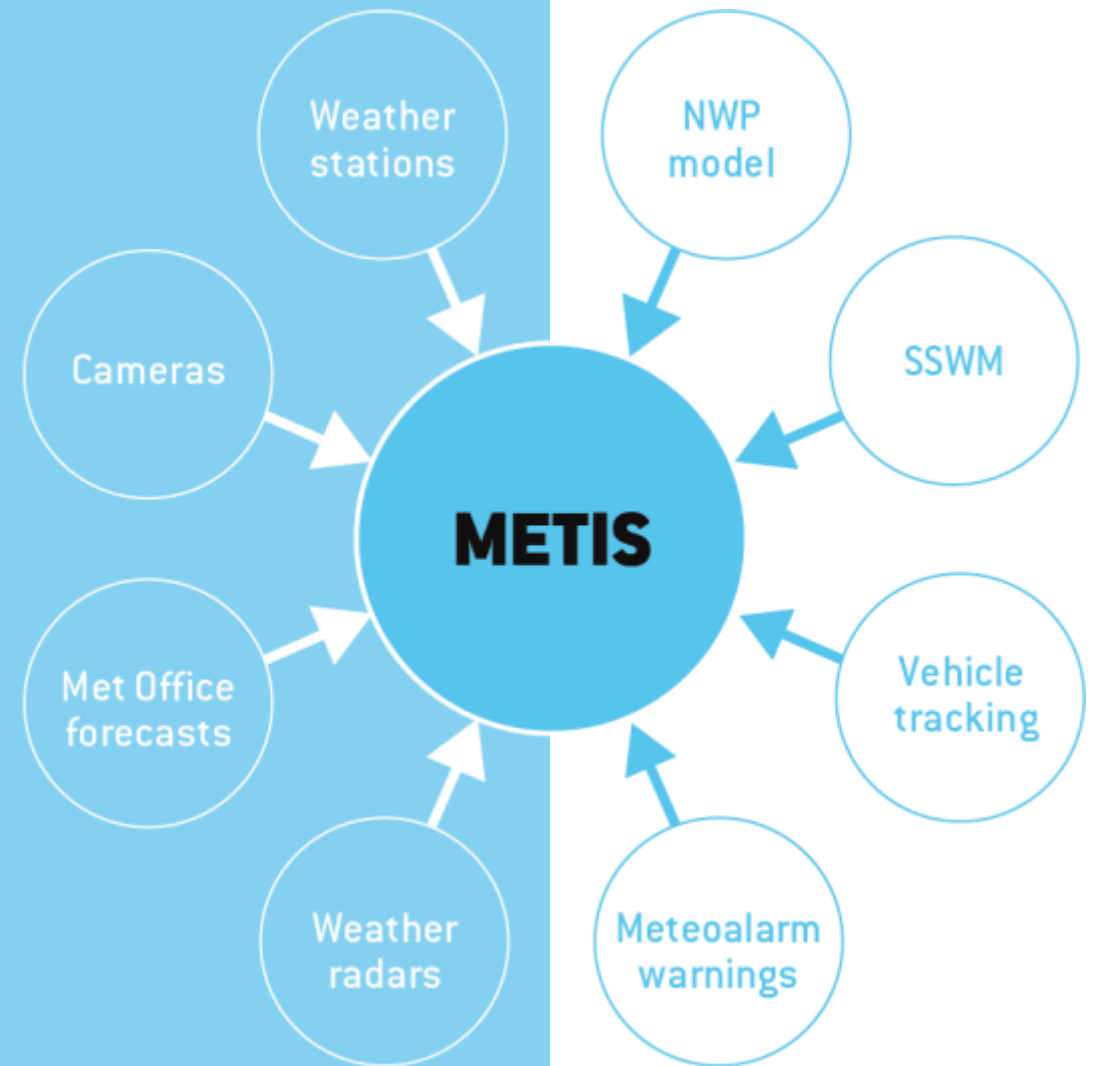
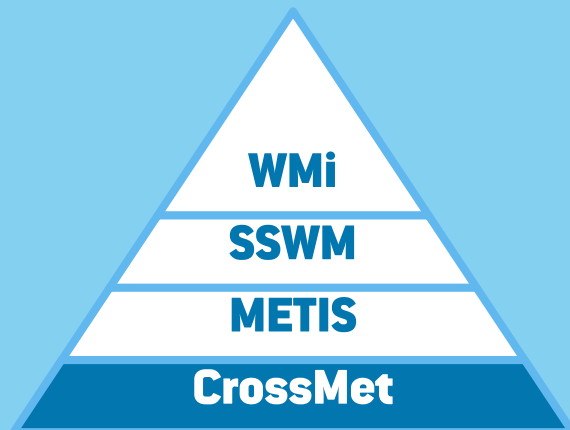
CROSS Zlín, Czech Republic

Introducing METIS

- Modular full-featured RWIS (incl. MDSS) & MIS
 - Decision-making
 - Maintenance management
- Developed by CROSS Zlín and used in the Czech Republic since 2003
- Czech national RWIS
 - 600 road weather stations, 500 cameras
- Flexible and open platform

The main advantage

Concentrates all weather-related data and information into a single application so that the maintenance dispatcher has everything at fingertips

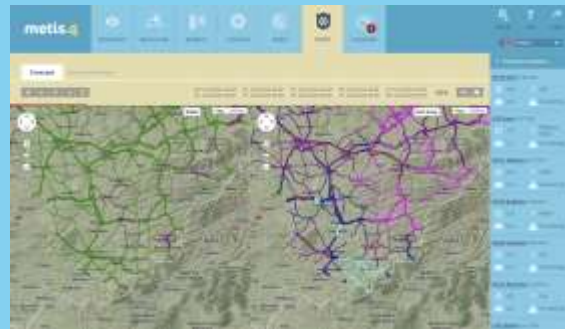


Key modules

Systems for monitoring and predicting road weather and multi-level options for intelligent winter road maintenance management



CrossMet V4
datalogger



METIS road weather
information system



SSWM maintenance
decision support system



WMI maintenance
evaluation and cost
analysis

Road weather information system

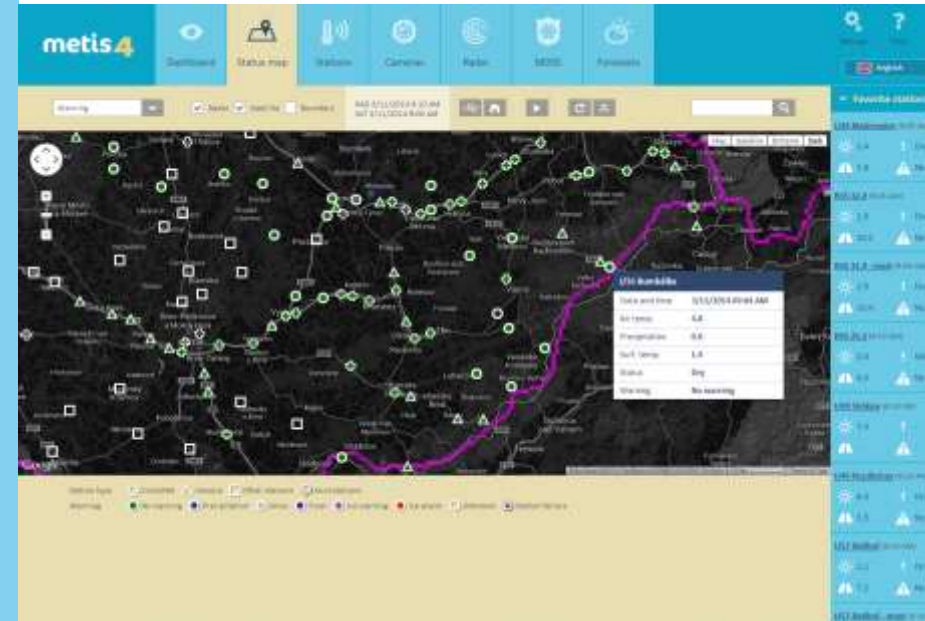
METIS CORE

- Cloud solution with web-based access
- Interactive presentation using maps, images, animations, tables, and graphs
- SMS / e-mail warnings
- User settings
- Mobile app for Android and iOS




STATUS MAP

- Map based presentation of weather station network
- Visualization in layers – warning, road condition, road temperature, cameras etc.
- Radar and satellite images



STATIONS

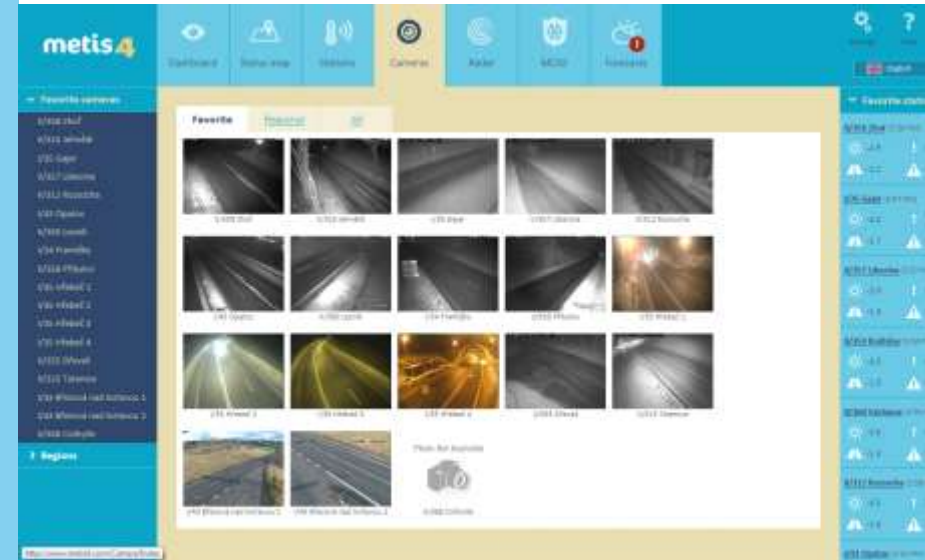
- List of stations and their measured data
- Custom definition of favourite stations
- Tables, graphs
- History and forecast graphs
- Camera images
- Metadata



The screenshot shows the 'metis4' dashboard interface. The main content area displays a table titled 'Favourite' with columns for 'Station', 'Time', 'T1', 'T2', 'T3', 'T4', 'T5', 'T6', 'T7', 'T8', 'T9', 'T10', 'T11', 'T12', 'T13', 'T14', 'T15', 'T16', 'T17', 'T18', 'T19', 'T20', 'T21', 'T22', 'T23', 'T24', 'T25', 'T26', 'T27', 'T28', 'T29', 'T30', 'T31', 'T32', 'T33', 'T34', 'T35', 'T36', 'T37', 'T38', 'T39', 'T40', 'T41', 'T42', 'T43', 'T44', 'T45', 'T46', 'T47', 'T48', 'T49', 'T50'. The table contains multiple rows of data for various stations, including 'A1001', 'A1002', 'A1003', 'A1004', 'A1005', 'A1006', 'A1007', 'A1008', 'A1009', 'A1010', 'A1011', 'A1012', 'A1013', 'A1014', 'A1015', 'A1016', 'A1017', 'A1018', 'A1019', 'A1020', 'A1021', 'A1022', 'A1023', 'A1024', 'A1025', 'A1026', 'A1027', 'A1028', 'A1029', 'A1030', 'A1031', 'A1032', 'A1033', 'A1034', 'A1035', 'A1036', 'A1037', 'A1038', 'A1039', 'A1040', 'A1041', 'A1042', 'A1043', 'A1044', 'A1045', 'A1046', 'A1047', 'A1048', 'A1049', 'A1050', 'A1051', 'A1052', 'A1053', 'A1054', 'A1055', 'A1056', 'A1057', 'A1058', 'A1059', 'A1060', 'A1061', 'A1062', 'A1063', 'A1064', 'A1065', 'A1066', 'A1067', 'A1068', 'A1069', 'A1070', 'A1071', 'A1072', 'A1073', 'A1074', 'A1075', 'A1076', 'A1077', 'A1078', 'A1079', 'A1080', 'A1081', 'A1082', 'A1083', 'A1084', 'A1085', 'A1086', 'A1087', 'A1088', 'A1089', 'A1090', 'A1091', 'A1092', 'A1093', 'A1094', 'A1095', 'A1096', 'A1097', 'A1098', 'A1099', 'A1100'. The table is part of a larger dashboard with a sidebar on the left and a top navigation bar.

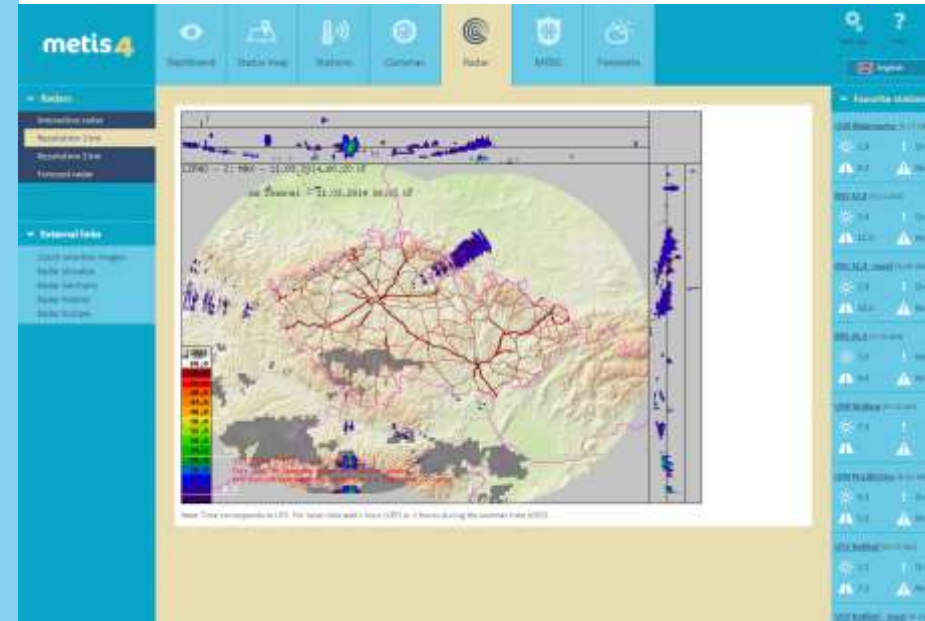
CAMERAS

- Real view of the road and current condition
- Custom definition of favourite cameras
- Hourly image previews
- Access to image history



RADAR

- Radar (precipitation) images
- Satellite (cloud cover) images
- Interactive animations
- Unique forecast radar
- Weather prediction model



FORECASTS

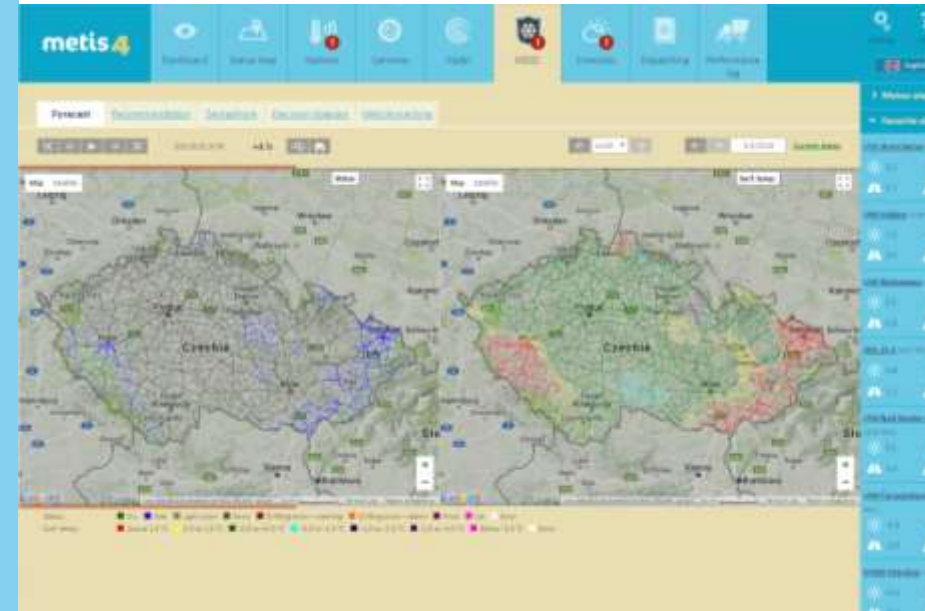
- General and regional
- Short-term and middle-term
- Special forecasts for winter maintenance



Maintenance decision support system

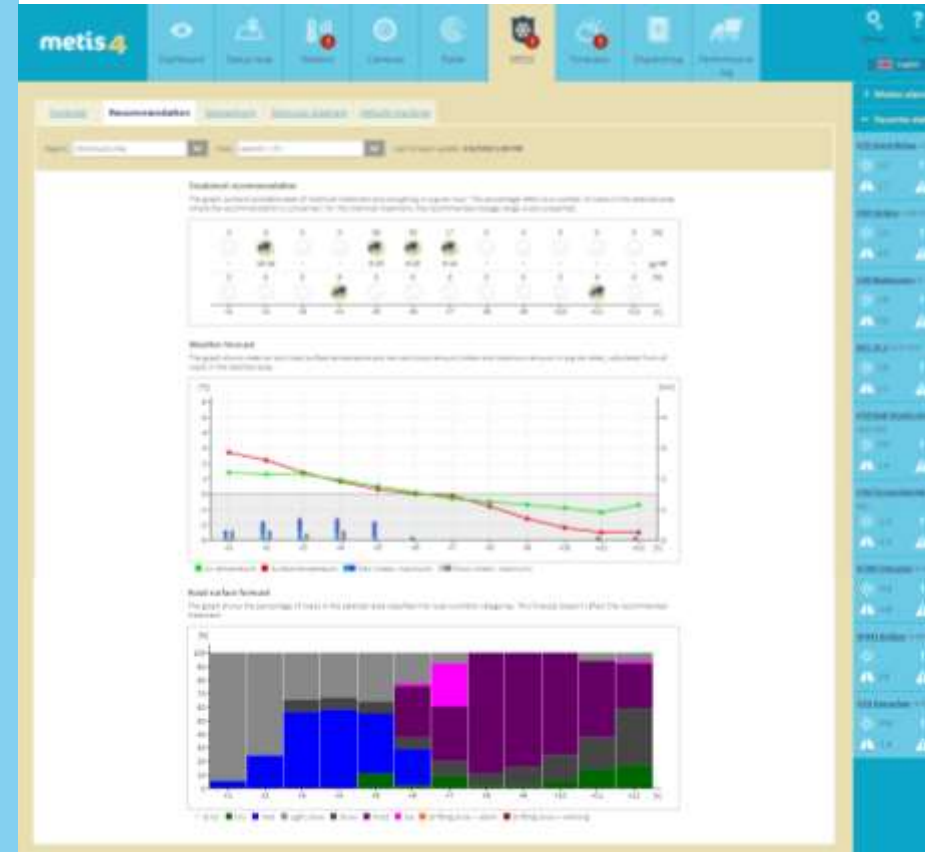
ROAD SURFACE FORECAST

- Based on SSWM model by CROSS and Klimator
- Using ALADIN prediction model in CZE
- Using thermal mapping
- Spatial modelling for 1km segments
- RST and road condition for next 12 hours
- Enabling selective maintenance



TREATMENT RECOMMENDATION

- Based on SSWM line forecast
- Agregated for maintenance areas
- Chemical treatment (incl. salt dosage) and ploughing for next 12 hours
- Meteogram
- Road condition diagram



MIDDLE-TERM FORECAST

- Middle-term forecast of possible winter maintenance activity
- Degree of readiness
- Planning number of dispatchers and staff

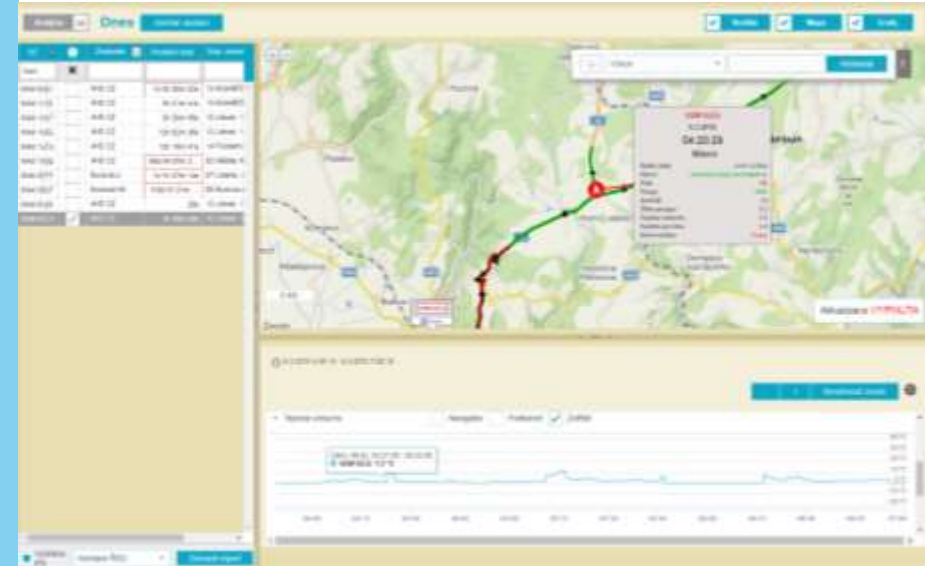


Maintenance information system

Including vehicle tracking

VEHICLE TRACKING

- GPS tracking of location and activity
- Spreading trucks, inspection cars
- Central database
- Map application – tool for decision-making and for supervision
- Base for maintenance reporting



REPORTING AND INVOICING

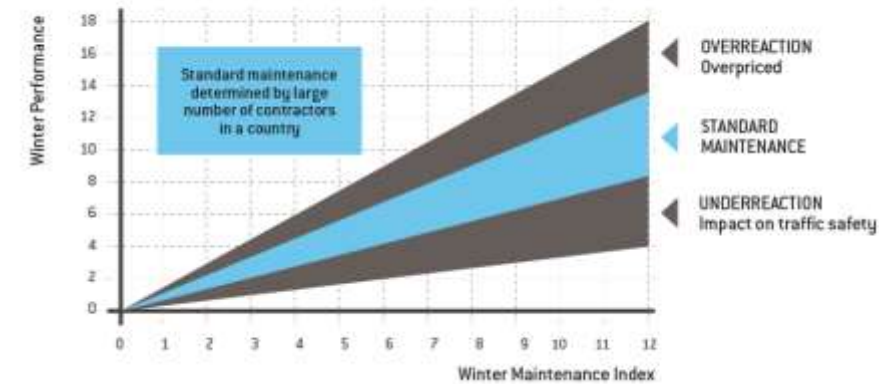
- Manual and automatic based on GPS data
- Automatic validation
- Corrections and closing of records
- Automatic invoicing module



The screenshot displays the metis4 software interface. The top navigation bar includes the 'metis4' logo and various icons for navigation and settings. The main content area features a data table with multiple columns, likely representing different metrics or data points. The table is partially obscured by a modal window or dropdown menu, but the visible columns include numerical values and categorical labels. The interface is designed for data management and reporting.

MAINTENANCE EVALUATION

- Evaluation of maintenance adequacy using Winter Maintenance Index by CROSS and CHMI
- Analysing recorded weather conditions (evaluating winter severity)
- Defining expected (standard) level of maintenance
- Detecting deviations from standard
- Correction tool for invoicing



Conclusion

- Complex, yet easy to use with very positive feedback
- Developed in CZE, but open to the world
- Ready to show live on our stand

**SUPPORT
THE RIGHT
DECISIONS**

**INCREASE
SAFETY ON
ROADS**

**OPTIMIZE
MAINTENANCE
COSTS**



THE WEATHER
CANNOT STOP YOU

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