

Providing of Traffic Information Related to Dispatcher Systems

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ABSTRACT

Operating dispatcher systems processing weather forecast data, meteorological data, and road condition data support dispatcher control of road management. They provide valuable traffic information data as well.

Traffic information comes from the following information sources - Unified Road Meteorology Information System and Winter Maintenance Information System.

Unified Road Meteorology Information System provides selected information from meteorological stations and weather forecast service.

Winter Maintenance Information System provides information on road surface condition including recommendations based on road condition and traffic status.

Information from both systems:

- is spatially located with respect to unified road network and has its own geographical interpretation. Meteorological stations are represented as point objects, while weather forecasts relate to specific regions and are represented as polygons. Road condition data relate to regions (polygons) or road segments (lines).
- is encoded using the Alert-C protocol (specific for traffic information).

The data is transferred via XML interface to National Traffic Centre. Then, it is further distributed using websites, data output, information boards, and RDS-TMC. Target user community includes public service, private organizations, and broad public (e.g. drivers).

Keywords: dispatcher system, weather forecast data

1 INTRODUCTION

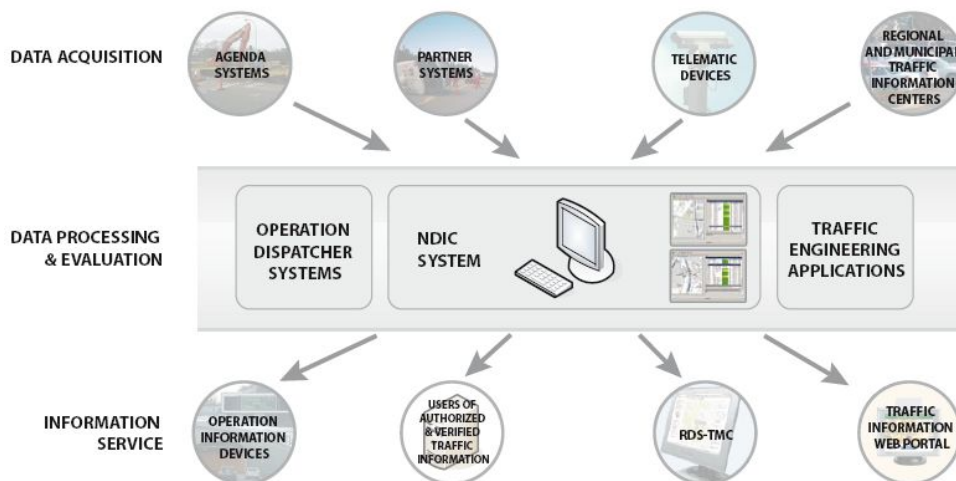
There is an increase of importance of quality traffic information and road data and road traffic data year by year. It is a basis for planning of investments to development and maintenance of roads and for realization of construction and road network maintenance itself. Along with growing usage of roads, there is an increased demand for up-to-date traffic information for commercial organizations and public. National Traffic Information Centre (NDIC), which is a part of Road and Motorway Directorate of the Czech Republic (RSD CR), creates and provides a complex system environment for providing of traffic information and traffic data from the road network in the whole Czech Republic by means of newly created Unified Traffic Information System (JSDI). Traffic information sources for JSDI include outputs of dispatcher systems - Unified Road Meteorology Information System (JMIS), Winter Maintenance Information System (ZZS) and Winter Maintenance Performance (VZU).

1.1 Unified Traffic Information System

Development of JSDI has been initiated by Government Decree No. 590/2005 covering JSDI establishment. The target of JSDI is to provide a complex environment that supports information integration from various information systems, to create environment supporting information processes of information transfer from subjects without own information systems, and to integrate data originated from various telematic devices.

Its main activities include:

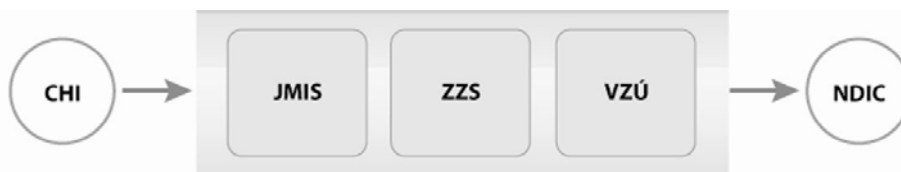
- collection, processing, evaluation, and providing of traffic information about operation of the whole Czech Republic road network, which includes a system of National Traffic Information and Control Centre, Operational Dispatcher Systems and systems of collaborating subjects (e.g. systems of Traffic Information Centre of Police CR),
- collection, processing, evaluation and providing of information from the field of property and passport of roads,
- support and development of telematic devices and integration of information from those devices,
- support and development of systems for support of actions of traffic engineers,
- linkage to crisis management and defense planning,
- training and public education in fields listed above.



Data Collection and Provision Scheme

2 OPERATIONAL DISPATCHER SYSTEM

Operational dispatcher systems belong to JSDI system groups. They include Unified Road Meteorology Information System, Winter Maintenance Information System and Winter Maintenance Performance. All mentioned systems provide important information to dispatchers of winter maintenance when they decide how to perform road maintenance in the winter season. Decision is supported by meteorological data that is delivered by Czech Hydrometeorological Institute, by measured data from road meteorological stations, by subjective announcements of dispatchers about current weather condition, and also by own personal experience from similar situations from previous winter seasons.



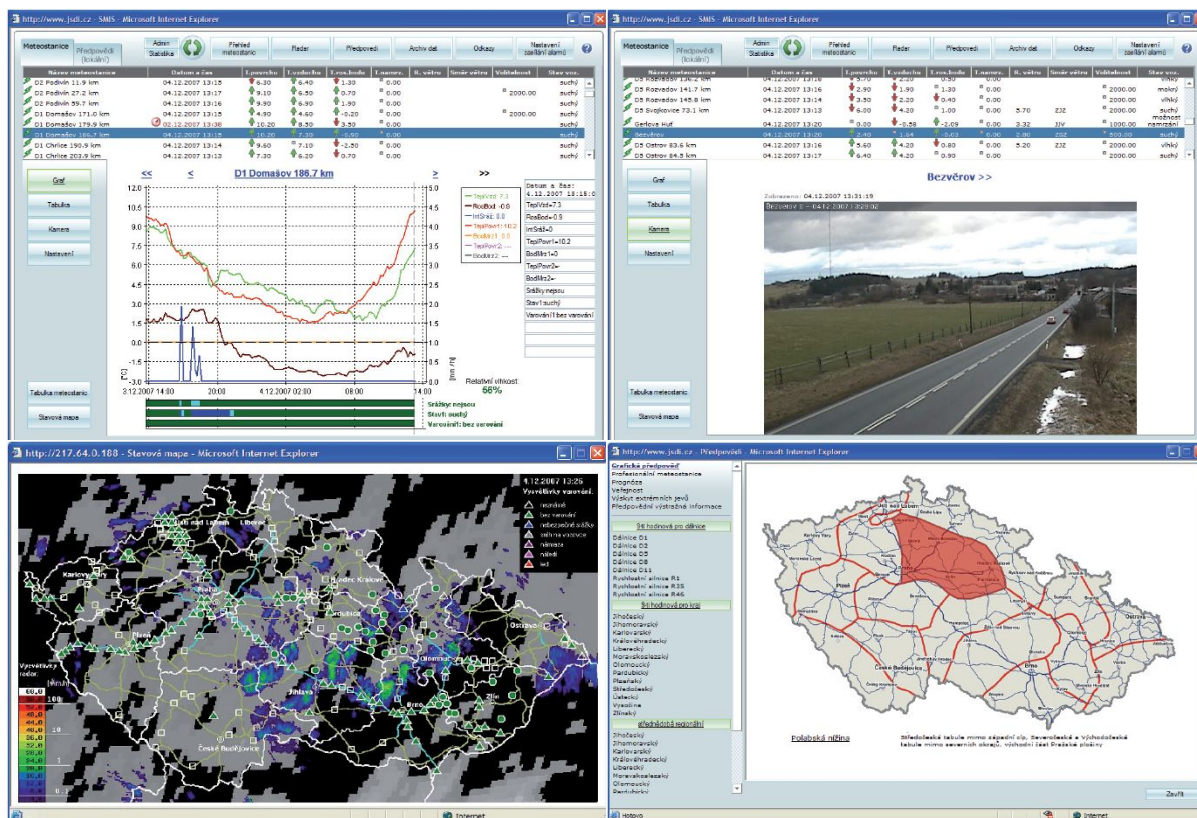
CHI – Operational Dispatcher Systems - NDIC

2.1 Unified Road Meteorological Information System

Unified Road Meteorological Information System (JMIS) provides its users with a complex meteorological data processing environment. There is data available from road meteorological stations, Czech Hydrometeorological Institute and other basic data in one application. The dispatcher is able to work with current information / weather forecast using simple tools and by this to correct efficiently maintenance of particular communications.

The system contains sections:

- display of information from approx. 275 road meteorological stations (up-to-date values of measured parameters processed in the form of graphs and tables) that deliver current data on-line or in regular intervals,
- display of forecast, warning and prognoses creates
 - o medium-term regional forecasts,
 - o 9-hour forecasts for regions,
 - o 9-hour forecasts for highways,
 - o warnings against extreme events,
 - o graphic forecasts,
 - o radar pictures of CR in 2 km and 1 km resolution, updated every 10 minutes,
 - o country map (combination of satellite and radar picture), updated every 10 minutes.
- indication of dangerous effects on roads (ice, rainfall)
- distribution of warning sms and e-mails to dispatchers of winter maintenance.



There are links to other additional information in the system – radars in adjacent countries (Germany, Austria, Hungary, Slovakia and Poland).

The system is able to communicate also over the border of Czech Republic and helps to increase border crossing safety.

JMIS is an integral part of JSDI. It is a central global system operated by RSD CR already during the **third winter season**. The system is available for all subjects performing road winter maintenance and organizations included in the integrated safety system at <http://www.jsdi.cz/udrzba>. Currently, 1600 users from about 580 organizations are registered in the system database.

2.1 Winter Maintenance Information System

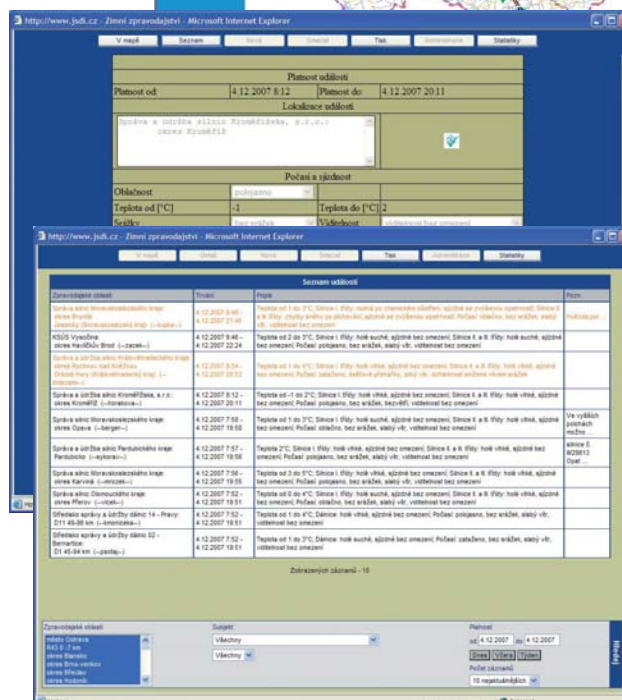
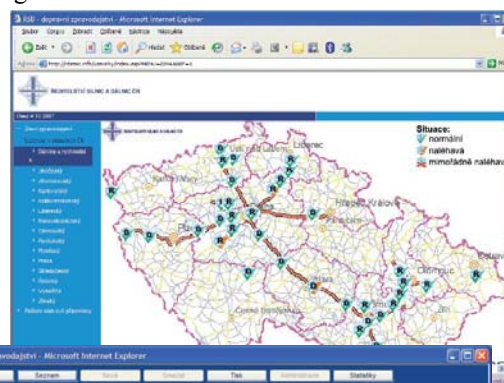
Winter Maintenance Information System (ZZS) enables the collection and registering of information about road condition, temperature, visibility in a single application. It also generates recommendations from the view of road condition and traffic influences. In one environment data can be inserted, modified/edited or displayed in the form of tables or in graphics by the user.

The system supports obligation to provide information about road condition according to Law no. 13/1997 Coll. and Decree no. 104/1997 Coll. Information about road condition is entered four times a day in the following time intervals:

- 3:00 – 5:00,
- 7:00 – 9:00,
- 14:00 – 16:00,
- 18:00 – 20:00.

Basic functionalities of the system are:

- sharing of registered information among system users who operate in neighboring areas,
- information providing on internet/intranet according to access rights and chosen information for public,
- it enables information entry related to set information regions that are created by districts and parts of districts or highway segments (it corresponds to field of activity of the subjects),
- it generates summary reporting about road condition in specific regions,
- it enables dynamic check of reports provision (depending on current conditions, it may ask the dispatcher to provide information e.g. in more frequent time interval).



Information is registered and provided within the scope of highways and speedways, roads of class I to III and local roads. Primary system users include centers of administration and maintenance of particular roads at all levels of RSD CR, possibly other subjects performing winter road maintenance.

As well JMIS, also ZZS is an integral part of JSDI; for this reason it is also accessible from address <http://www.jsdi.cz/udrzba>. ZZS is a central all-republic system operated by RSD CR already during the **fourth winter season**. The system is currently used by 1600 registered users. It was entered approx. 73000 reports about road condition in winter 2006/2007 and nearly 75000 reports in winter 2007/2008.

2.1 Winter Maintenance Performance

The system Winter Maintenance Performance (VZU) enables its users to check performance of winter maintenance in a defined region. It registers information about performed winter maintenance on roads and evaluates efficiency of its use. Thus, the system user can optimize high quality winter maintenance from several different viewpoints (economical savings, suitability of material used for specific segments ...).

A basic feature of the system is a collection support always for last 24 hours and for defined reporting region of those data:

- length of maintained roads (in km) listed as total values and lengths subjected to a technology,
- inspection tours (km)
- consumption of road spreading (including inert material, salt, deicer, CaCl₂),
- mechanization application (spreaders, tractors, snow ploughs, snow blowers, loaders...),
- workers engagement

Data providers are especially

- organization units of RSD CR (they perform winter maintenance on highways and speedways),

The screenshot shows a web browser window displaying a table with columns for 'Datum' (Date), 'Typ' (Type), 'Kategorie' (Category), and 'Místo' (Location). The table lists various maintenance activities such as 'Správka a údržba silnic' (Road maintenance) and 'Správka a údržba silnic - úhromně' (Road maintenance - total) for different dates in 2007. The interface includes a search bar and navigation buttons.

The screenshot shows a web browser window displaying a summary table for the road segment 'SSUD 03 - Velký Beranov D1 94-141,5 km: 1.11.2007 - 30.11.2007'. The table has columns for 'Datum' (Date), 'Průjezd silnic (km)' (Road travel km), 'Průjezd silnic s odstraňováním (km)' (Road travel with clearing km), 'Odstředění průjezdu (km)' (Clearing distance km), 'Kontrolní jízda (km)' (Control trip km), 'Kontrolní jízda (CA (km))' (Control trip (CA (km))), 'Spotřeba štěrku (t)' (Gravel consumption (t)), 'Spotřeba soli (t)' (Salt consumption (t)), and 'Spotřeba CaCl2 (t)' (CaCl₂ consumption (t)).

Datum	Průjezd silnic (km)	Průjezd silnic s odstraňováním (km)	Odstředění průjezdu (km)	Kontrolní jízda (km)	Kontrolní jízda (CA (km))	Spotřeba štěrku (t)	Spotřeba soli (t)	Spotřeba CaCl2 (t)	
1.11.2007	0	0	0	0	0	0	0	0	
2.11.2007	0	0	0	0	0	0	0	0	
3.11.2007	0	0	0	0	0	0	0	0	
4.11.2007	0	0	0	0	0	0	0	0	
5.11.2007	0	0	0	111	0	0	0	0	
6.11.2007	381	0	0	104	0	23	7190	0	
7.11.2007	283	0	0	37	0	19	870	0	
8.11.2007	0	0	0	0	0	0	0	0	
9.11.2007	128	0	0	0	0	22	6600	0	
10.11.2007	587	423	0	40	104	73	22000	0	
11.11.2007	59	1441	73	0	0	120	36000	0	
12.11.2007	219	1324	143	40	0	140	48000	0	
13.11.2007	381	147	0	0	0	34	41	12300	0
14.11.2007	1074	300	41	0	0	117	38100	0	
15.11.2007	530	224	35	82	0	63	18900	0	
16.11.2007	85	337	101	89	33	36	11400	0	
17.11.2007	318	0	0	0	0	18	5400	0	
18.11.2007	2002	0	0	10	0	71	21000	0	
19.11.2007	76	0	0	32	0	0	1800	0	
20.11.2007	340	0	0	51	0	21	8300	0	
21.11.2007	484	0	0	0	0	41	12300	0	
22.11.2007	81	0	0	62	0	0	1200	0	
23.11.2007	198	0	0	2	0	0	1800	0	
24.11.2007	35	0	0	73	20	1	300	0	
25.11.2007	150	150	30	0	0	25	7500	0	
26.11.2007	426	1291	84	50	0	200	6000	0	
27.11.2007	416	244	80	140	0	40	14400	0	
28.11.2007	104	0	0	0	0	0	1800	0	
29.11.2007	140	354	0	47	0	44	13200	0	
30.11.2007	85	277	122	84	0	30	8900	0	
Celkem	8563	6112	680	1396	340	1136	342150	0	

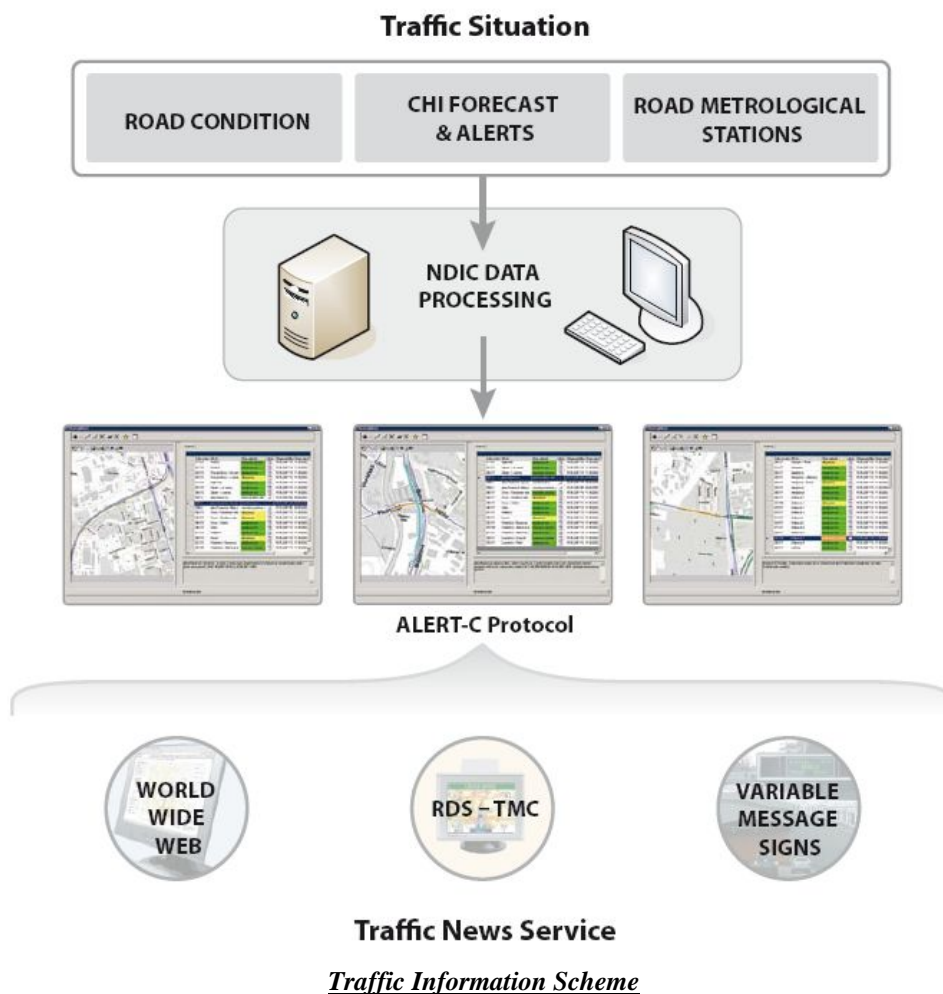
- supplier of winter maintenance (they perform maintenance of roads of class I),
- administration and maintenance of regional roads.

Information is registered in a scope of highways and speedways and roads of class I to III. Primary system users include centers of administration and maintenance of particular roads at all levels of RSD CR, possibly other subjects related to winter road maintenance.

As well JMIS and ZZS, also VZU is an integral part of JSDI; for this reason it is also accessible from address <http://www.jsdi.cz/udrzba>. VZU is a central system operated by RSD CR already during the third winter season. The system is currently used by 1370 registered users. There were about 15000 reports registered in winter 2006/2007 season and nearly 21000 reports in winter 2007/2008 season.

3 TRAFFIC INFORMATION

Information in pre-defined structures using XML format (current weather condition from road meteorological stations, road condition) is created from JMIS and ZZS systems of the group Operational Dispatcher Systems and it is transferred to JSDI system. Advantages of this information include unified localization to unified network and description of weather condition/road condition using the ALERT-C code. On the JSDI side, this information is transferred to traffic information and then distributed to users (drivers, road caretakers) via various channels. One of the important channels is the RDS-TMC, which makes it possible for the drivers to receive the traffic information online - i.e. directly in a car.



Implementation of the traffic information generated by the JSDI system is shown in the following table:

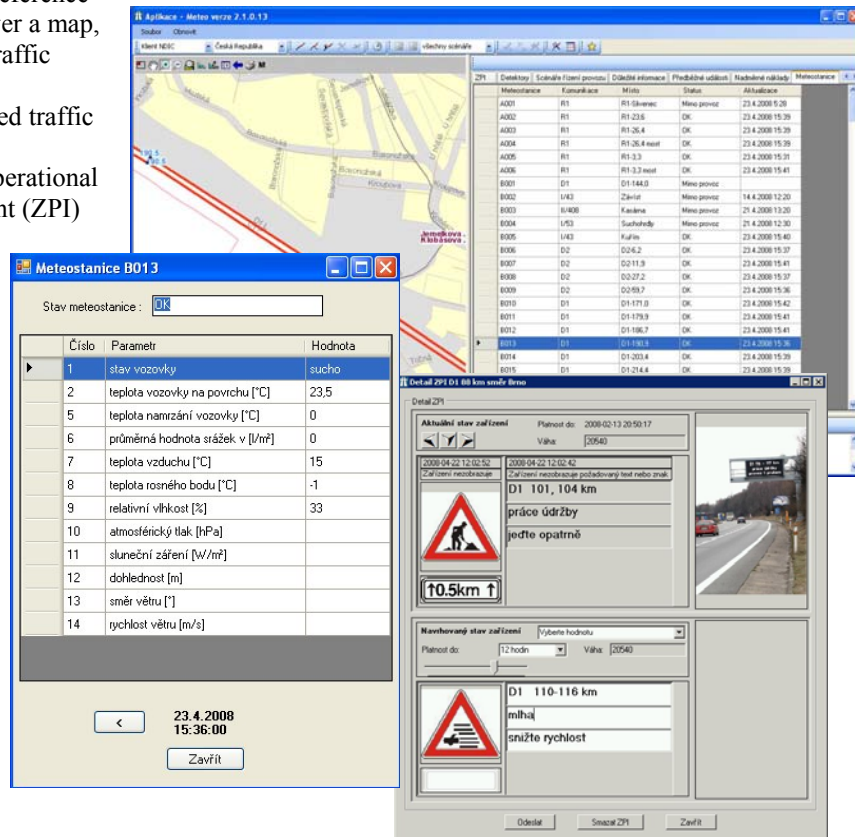
<i>From 1.12.2006</i>	<i>2007</i>	<i>To 31.3.2008</i>	In total
4 706	119 125	114 055	237 886

Table1. Number of traffic information generated from dispatcher systems

3.1 Interpretation of Events

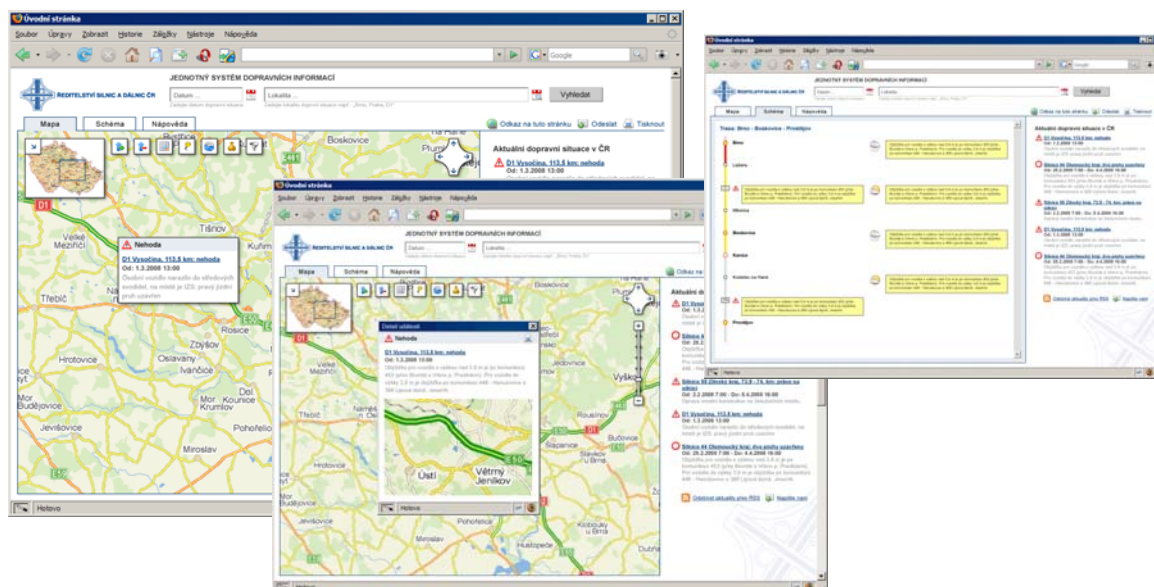
News initiated on the JSDI side is available to users via a client editorial system. The editorial system enables:

- visualization of geo-reference traffic information over a map,
- editing of delivered traffic information,
- examination of detailed traffic information,
- text adjustment for operational information equipment (ZPI) including a symbol.



4 PUBLIC OUTPUTS

Major JSDI output channels include the Traffic Newsletter (Newsletter). Its main task is to visually unify the content of traffic information that has direct influence to traffic situation or that relates to road traffic. This applies to the entire Czech Republic area including border regions of adjacent countries.



The Newsletter core is a presentation of important traffic information for drivers. The majority of information is geo-referenced and shown over a map. The map consists of map compositions depending on a scale used and also contains complete network of the Czech Republic roads with other added reference materials.

Provided traffic information can be divided into categories based on their characteristics:

- information about current traffic situation (accidents, closures, road condition , camera snaps, ZPI texts, ...),
- preliminary information about prepared actions (planned closures, sport and cultural actions ...).

Information about current traffic situation is the most important for the users. The user is able to search information according to administration units, roads or route between two points. The search result is information displayed in the desired locality. Further more, it is possible to filter data using the symbols. The Newsletter offers advanced search for points of interest (e.g. hospitals) nearest to the route between two points or to the actual road.

Preliminary information about prepared actions is preventive information, whose aim is to warn the traffic information users about a planned long-term or short-term action.

References

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