Real Time Traffic Information (RTTI)

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RTTI: Some Keywords

- Why do we (= Road Authorities) need RTTI?
- RTTI in its Context
- RTTI and Traffic Management
- RTTI Technologies
- RTTI and the eSafety Initiative
- RTTI as Public or Commercial Service?
- State-of-the Art and necessary Improvements
Development Motorway Network / Veh. Mileage 1975-2004

Network Length in km

Veh. Mileage in Mrd. Veh-km

- Veh. Mileage
- Network

Dr. Fritz Bolte
Transport Research Arena Conference Ljubljana (TRA 2008)
Development of Traffic Loads

Average Daily Traffic (ADT) (Veh/day)

- Bundesautobahnen
- außerörtliche Bundesstraßen

Jahr


48.100

9.130
Average Daily Traffic (ADT) and Peaks

ADT Mo-So

Veh/day

200,000
150,000
100,000
50,000

AD Heumar (N)
AD HH-Mönchhof (S)
AD Mönchhof (O)

ADT on Motorways

DTV..
“Europe 27”

- 27 Countries
- ca. 480 Million Inhabitants
- Increasing international Traffic
- Cohesion of Europe requires to overcome barriers
ADT of Foreign Vehicles on German Motorways (2003)

<table>
<thead>
<tr>
<th>Country</th>
<th>ADT (Veh/day)</th>
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<tbody>
<tr>
<td>NL</td>
<td>1000</td>
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<tr>
<td>PL</td>
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<td>400</td>
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ADT = 50,000 Veh/day

ADT_{foreign} = 4043 Veh/day = 8.1%
Traffic Management on German Motorways

Variable Direction Signs
Stretch Control
Intersection Control
Temporary Use of Emergency Lanes
Ramp Metering

Variable Direction Signs with additional Information
## Traffic Management on German Motorways

### Traffic Control Centers (VRZ)
- 9 VRZ operational
- 6 VRZ planned

### Stretch Control
- 950 km operational
- 250 km planned

### Network Control
- 2000 km operational
- 500 km planned

### Ramp Metering
- 80 sites operational
- 40 sites planned

### Temporary Use of Hard Shoulders
- 250 km operational
- 150 km planned

### Permanent Use of Hard Shoulders
- (in preparation of enlargement to 6 lane)
  - 250 km operational
  - 100 km planned

### 100 % Traffic Broadcasts (RTTI)
(Status 2007)
Where are the Gaps?

- White spots on motorways
  - Detection and Dynamic Signalisation missing
- Limited amount of Information on Variable Message Signs (VMS)
- Secondary Networks uncovered
  - Urban and interurban Highways
- Increased Use of Navigation Systems

Can Traffic managers afford to neglect these gaps?
Can Traffic Information (RTTI) help?
RTTI: Incentives for RDS-TMC

Traffic broadcasts since 1965, but problems...

RDS-TMC as solution

- Huge amount of messages
- Updating route calculation in on-board navigation systems
- Language independence (international traffic)
- IT supported message generation
- IT supported message management
"Traffic Message Channel" (RDS-TMC)

Traffic Control Center

Broadcasting Station

Traffic Detection

Receiver, Navigation System, PDA, ...

FM Transmitter

RDS-TMC Autoradio
RDS-TMC: Main Advantages

- Digitally encoded Events and Locations
- Economic and efficient Transmission
- Automatic Processing and Evaluation
- Selective Display as desired
- Language Independence
- Information useful for Navigation Systems

WDR Website 2008-04-19, 16:30h (Saturday)
Public RDS-TMC Services in Germany

- Full Coverage
- Event list available,
- Location Code List available, owned and updated by Public Authorities
- 36,000 Locations on all Primary Roads and main roads of secondary interurban and urban Road Network
- Free Services operational on about 50 radio channels
Navigation System Market

Germany:
- Sales 2006: 2.2 Mio Units
- Sales 2007: 3.6 Mio Units
- Sales 2008: < 4.6 Mio Units expected
- >99 % Nomadic Devices
- ca. 12 Mio Receivers on the Market
Most European countries have well-established TMC services
- Mainly public free services, but also commercial services
- Services under development in new European ‘Accession’ countries – CONNECT project
- Commercial service live in USA
- Service trials and development in China (DYNASTY project), Australia and beyond
How can RDS-TMC help Traffic Managers?

Synergy …

• ... of Roadside Regulations ...

• ... and In-Vehicle Information
RTTI and European Aspects

European eSafety Initiative

Goal:
European challenge to halve fatalities till 2010
Minister
Wolfgang Tiefensee

EU Vice President
Jacques Barrot

EBU President
Fritz Pleitgen
... took up results of eSafety Working Groups to support further progress, a.o.:

- ... recognised Traffic Information as contribution to Safety
- ... required free access to safety relevant information
- ... required implementation of RDS-TMC as language-independent means to distribute traffic information
- ... recommended further improvement of traffic monitoring and inclusion of strategic Road network
### Conclusion 1

| ✔️ RTTI highly relevant for Traffic Safety |
|✔️ further improvements |
|✔️ quality standards |
|✔️ provisions of sources |

“The eSafety Conference agreed that traffic information is highly relevant to road safety.

Both the users and the players involved in the information chain are calling for further improvements in terms of quality and coverage in order to meet the objectives of improving road safety and to assist the driver in performing his driving task.

Realistic and feasible quality standards should be developed jointly, with the involvement of all stakeholders. Provisions of sources, whatever public, private or public / private should be made available in all member states.”
The Conference notes that traffic information services should cover not only the primary networks (e.g. motorways) but also sizeable sections of the secondary networks. To this end, “strategic networks” are to be defined. Here, it is quite conceivable that different quality levels could be applied to the individual network sections.”
The increasing number of traffic messages makes it necessary to transmit traffic information digitally so that it can be automatically processed in an appropriate manner, both during the generation and management of the messages and by the users’ receivers.

For this purpose, the “Radio Data System - Traffic Message Channel (RDS-TMC)” has been developed, which is already in operation in numerous European countries, albeit with varying degrees of intensity.”
If the secondary networks are to be included, it might be necessary to change over from analogue radio channels to digital broadcast channels (e.g. DAB, DRM). To ensure universal coverage in conurbations, provision will have to be made for appropriate transmission capacity.

Joint implementation strategies should be developed on a Europe-wide basis to facilitate access to this information, which is not based on a specific language. The aim is to create reasonably consistent information services within the European Union.
“In Europe, there are both freely accessible “public” traffic information services and commercial information services, which users can access by paying a fee. The Conference notes that, from a transport policy perspective, access to safety-related traffic information should be possible world-wide without users having to pay additional costs.

Some countries have already categorised safety-related information by way of example. The minimum scope of safety-related traffic information should also be defined on a Europe-wide basis. This will not rule out the possibility of individual countries going beyond this scope when providing freely accessible information.”
✓ **Commercial information services have their place**

✓ **They cater to the individual needs**

“Commercial information services have their place alongside freely available traffic information services.

The services they offer may go significantly beyond those offered by public information services and cater to the individual needs of customers.”
The Conference believes that Member States should, in accordance with the principle of subsidiarity, also make the necessary rules and arrangements for the free provision of safety-related traffic information within the framework of Public-Private Partnerships (PPPs).
The newly developed systems using Car2Car communication and Car2Infrastructure communication are believed to offer great scope for improving road safety. Accidents are to be prevented by interlinking information from vehicles in the vicinity, and possibly also with roadside infrastructure, and by providing timely information on risks.
“For this information, which is highly relevant to safety, it is necessary to provide reliable and globally acceptable frequency bands that are not subject to interference from other services.

The Conference believes that Member States and the European Union should call for and support the efforts for the allocation of reliable Car2 Car and Car2Infrastructure frequencies.”
“To ensure that traffic information provides greater coverage, it is necessary to open up new information channels.

The inclusion of vehicle-generated data (floating car data, floating phone data, etc.), data provided by congestion reporters, emergency call systems, etc. makes it necessary to form public private partnerships, within which it must ensured that this improved data basis can be used by both public and commercial service providers for collective traffic management and individual services respectively.”
Commercial Service Providers

- Commercial Sensors
- Floating Car Data
- Floating Phone Data
- Congestion Reporters
- Private Patrol Cars
- Helicopters
- Aircrafts
- Commercial Info Centres

Example: DDG Sensors

(Photo: DDG)
Interests of Public vs. Commercial RTTI Services

Public Authorities
– Sustainable Mobility
– Traffic Safety
– Enabling cross-border travellers to get access to safety-relevant messages
– Environmental Protection
– Traffic & Transport Efficiency
– Enabling International Competitiveness of ITS Industry

Private Actors
– Low Risk of Investment
– Return of Investment
– Economic Success
– Good Market Position

In case of Competing Interests:
Priority for Transport Policy objectives ...

... or for Commercial Interests?
Information needed
...

- Warning
- Recommendation of Alternative Route
- Removal of Road Block

... for all users
Minimum of Traffic Information Free of Charge

Example: Hazard Levels 1 - 7:

Level 1: High-risk situations – Wrong-way drivers‘
Level 2: Specially risky situations
   People, Animals shed loads
Level 3: Traffic disturbances, Road Blockages
Level 4: Traffic disturbances, Traffic stops
Level 5: Traffic disturbances, slowly moving traffic
Level 6: Restoring fluidity of traffic by reducing waiting times
Level 7: Keeping traffic fluid to avoid economic damage

(agreed by the German National platform of Traffic Information Services)
Mobile Detection

FCD (Floating Car Data)
- Satellite
- GPS Receiver

FPD (Floating Phone Data)
- Cellular network antenna
- Mobile phone
Value Chain of Information Services

Generic model of Information generation

Co-operation needed
Some Principles:

• **Public agencies**, their partners and the public
  – all **benefit**
  – from provision of **quality** real-time traveller and traffic information.

• **The private sector**
  – provides traffic and traveller information through **unique business models**
  – need to have **long-term viability**.

• The **public sector** has a **clear interest** in disseminating traveller and traffic information to support their traffic management and control functions.

• The **balance** that satisfies the needs of travellers and of public and commercial service providers
  – is an **important policy question** which needs to be answered
Public and Commercial Services: Similar functions

- Basics: Map Data, Location Code List
- Content provision: Data Collection, Traffic Monitoring
- Quality Management
- Market Development
- Application of suitable Traffic Management Strategies, avoiding inconsistencies of information and recommendations
- Supporting Mobility
Basis for future Business Models needed

Development Framework
Rules of Co-operation

Authorities
Responsibilities
Strategies

Private Sector
Frame of Operation
Legal Basis
Code of Practice
Conclusion: Competition or Synergy?

Co-existence and Co-operation

Joint efforts to improve Data bases; Data Pooling
Collective Information and individually tailored Information
Vision needed: Common Task

Mobility Management

- Automobile Industry
- Police
- Broadcasters
- Road Authorities
- Commercial Info-Services
- Telematics Industry
- End User

End User
Thank You for Your Attention.

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