Cross Corridor Cooperation Workshop
"Future Challenges for Traffic Management Centres"
12-13 November 2019, Bergisch Gladbach, Germany

Report on CCC workshop on "Future Challenges for Traffic Management Centres"

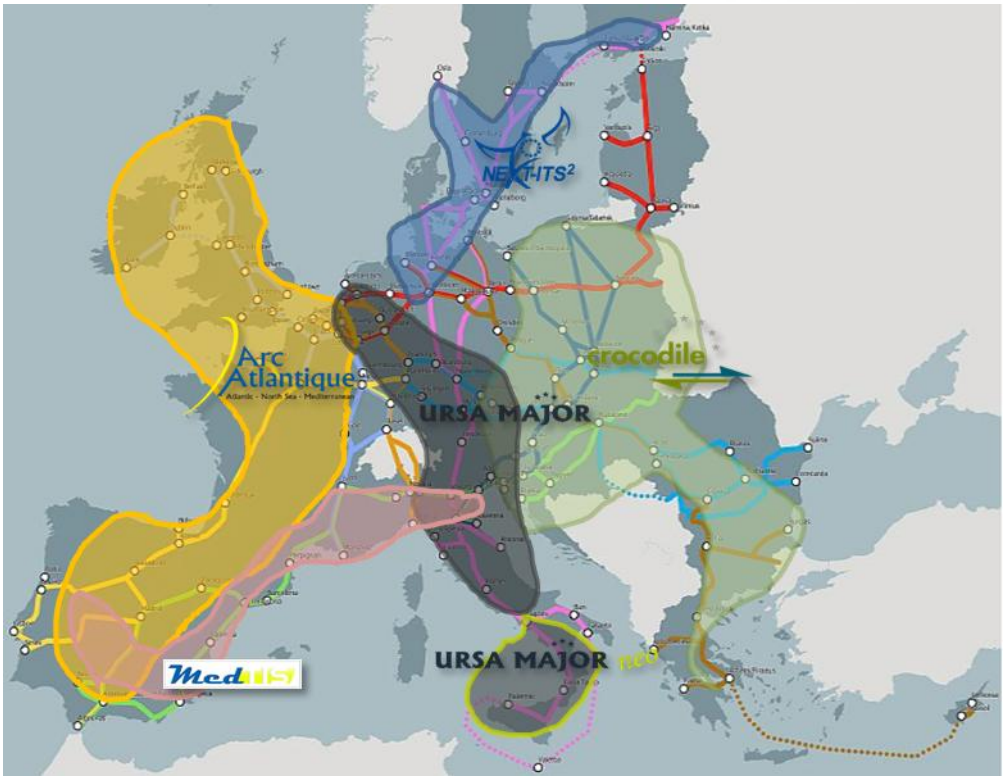
Title: "Cross Corridor Cooperation Workshop on "Future Challenges for Traffic Management Centres"

Venue: Federal Highway Research Institute (BASt), Brüderstraße 53, Bergisch Gladbach, Germany.

Date and Time: November 12th 12:00 – 17:30, November 13th 09:00 – 12:45.

Participants: 44 participants from 14 EU countries and Switzerland. For the full participant list, please see annex 2.

Hosts: The workshop was hosted by the **EU EIP** (A2 working group East-West Corridor) and the **NEXT-ITS3** working group on traffic management and carried out in cooperation with the ITS corridor projects Arc Atlantique 3, Crocodile 2, MedTIS and URSA MAJOR neo.



NEXT-ITS3

Partners: Ministries/Road Administrations from Sweden (Coordinator), Finland, Denmark, Norway and Northern/Eastern Germany. Financially supported by the Central Europe Facility of European Commission.

The project (2018-2020) covers the Northern part of the Scandinavian-Mediterranean corridor, including the core road network and the key comprehensive network links. The aim is to enhance corridor and network performance by deployment of ITS services that ensure interoperability and continuity of services, support harmonization, and increase the cost-efficiency in the operation of traffic management.

EU EIP

The EU ITS Platform (EU EIP) is the place where National Ministries, Road Authorities, Road Operators and partners from the private and public sectors of almost all EU Member States and neighbouring countries, cooperate in order to foster, accelerate and optimize current and future ITS deployments in Europe in a harmonized way. In order to foster cooperation and the necessary consensus between EU Member States, the EU ITS Platform will facilitate the establishment of a commonly understood state of the art and promoting the actual take-up of EU specifications, guidelines, best practices and/or methodologies. Within EU EIP the Working Group East-West Corridor addresses the corridor running from Ireland – UK – Benelux – Germany – Poland - Baltic States – Finland, including the following subtasks:

- Creation of a cooperating ITS community along the East West Corridor and inventory of planned ITS investments for seamless services
- Feasibility study of selected planned ITS investments for European seamless services
- Recommendations for roll-out of seamless ITS services on the East West Corridor.

Background and objectives

Traffic volume continues to increase, new technologies such as autonomous vehicles, Car2X and further innovations in transport continue to develop and the interfaces between the urban and interurban areas become more important. Traffic Management Centres have to deal with these challenges by implementing innovative systems and software and a closer cooperation with neighbouring traffic centres, other modes, as well as between the urban and interurban area. The objective of this workshop was to present and discuss the challenges of traffic management centres and existing and planned innovative systems and software as well as possible cooperation between traffic centres.

Topics

For the workshop a call for paper was published. Possible topics which should have been addressed:

- Innovative systems and software in Traffic Management Centres (new ideas, implementations, best practices)
- New technologies (e.g. CAR2X, autonomous driving etc.) and corresponding or necessary new systems in Traffic Management Centres
- Traffic Management in urban areas, including approaches for urban-interurban cooperation
- Specific issues which might be or should be addressed by Traffic Management Centres, e.g. environmental issues, management of major events, incident management, winter management etc.
- Cross-border cooperation, common management/information
- Traffic Management Centre automation
- Any other topic that fits the aim of the workshop presented above.

12.11.2019 day one (12:00-17:00)

(1) Welcome and Introduction

The workshop started with a welcome and some basic information by the host and the organisers:

- Opening and welcome by Orestis Giamarelos on behalf of the host (Federal Highway Research Institute, BASt)
- Opening and welcome by Roberto Arditi on behalf of EU EIP and East West Corridor
- Opening and welcome by Dieter Sage on behalf of NEXT-ITS3 working group for Traffic Management

Session 1: Automation in Traffic Management Centres

1) Using vehicle generated data for optimization and automation of traffic management (NRW), Dr. Jens Ansorge, Landesbetrieb NRW, Germany

Jens started with the motivation for the use of vehicle data, the need for data by ITS applications. He explained two cases where data is needed:

- Network management/rerouting
- Dynamic lane control

Then he explained the status quo of traffic detection on NRW's motorways, i.e. the existing network coverage and the limitations of the stationary detection.

The purchase of commercial aggregated Floating Car Data for TM contributes to improved data basis, the preparing steps in the TCC were explained.

Floating Car Data for bottleneck analysis and statistics are used for the identification and analysation traffic conditions on motorways.

Floating Car Data for bottleneck analysis and statistics were described on the following slides:

The number and locations of Variable Message Signs for Rerouting (dWiSta) in North Rhine-Westphalia were shown.

Then the strategies causing automatic programmes in case of congestion were described as well as additional strategies for specific cases:

- In case of unexpected road closures
- In case of long distance corridor / cross border management
- In case of a major event or planned road works

Finally, he showed the further steps in network management in NRW, i.e. the completion of strategies, analysis of possible combinations of predefined programmes, the integration of global strategies and the equipment of road site stations with modules for V2X communication.

Vehicle Messages via V2X communication for Traffic Management

Research project "Cooperative Mobility on the Digital Testfield Düsseldorf – KoMoD" (06/2017 – 08/2019) focussed on making information on VMS directly accessible by vehicles. It will be carried on with the follow-up project KoMoDnext (01/2020 – 12/2021). The following slides addressed

- Extension by V2X communication (Roadside Units)
- Enable infrastructure for V2X communication and implement vehicle data into traffic control

Conclusions/Discussion: Vehicle generated data

- Additional source to existing traffic detection for traffic management – may make further expansion of own detection dispensable
- Applicable aggregation level depends on penetration rate, quality requirements (network coverage, latency, reliability, etc.) and available resources for further processing (including requirements on privacy, etc.)

- "Make or buy": Availability of service providers with affordable licence policy, satisfying quality and acceptable transparency of their processes and results necessary to rely on pre-processed data for traffic management

Presentation: 1 - Jens Ansorge FCTMC_Vehicle-Generated-Data-NRW

2) The use of Smart Cameras and Artificial Intelligence in Dutch Traffic Management Centres, Johan van Eyk, Rijkswaterstaat

Why smart cameras? For safety, accessibility, livability

- Opening/closing rush hour lanes takes 30% of time operators
- Smart cameras mainly to be used for IM and rush hour lanes
- 3000 cameras in NL

What should be the specifications of such a system?

- How to make existing cameras smarter
- Add artificial intelligence to look at the images, giving advice to TCC
- Tender in October 2019, won by ARS
- End of 2019 the system should be operational
    - Motion detection and object detection
    - Pilot on 5 km, near Delft, with 33 cameras, TCC Rhoon
    - AI will need time to 'learn'
    - End of 2020 business case should be ready

What does the system deliver?

- Earlier awareness of incidents
- 2700 hours per year less operation (staff of TCC)
- 1,6 million less vehicle loss hours
- Less unnecessary opening/closing of rush-hour lanes
- Currently you can only look at the pictures of 5% of the cameras. With artificial intelligence this will drastically increase.

Further possibilities for the use of smart cameras in the future exist:

- Fog detection
- Opening bridges
- Hazardous substances transport
- Replacing defective induction loops

Limitations:

- Limitations for the use of smart cameras exist in the case of bad weather

Conclusion/Discussion:

- Great potential for Smart Cameras
- 2700 hours of staff costs could be saved, but this does not mean less staff, but with the same staff you can do much more

Presentation: 2 - Johan van Eyk Smart Cameras and artificial intelligence

3) Experiences and benefits of automation in Traffic Management Centres, Petri Antola, Finnish Transport Infrastructure Agency

This presentation on experiences and benefits of automation in Traffic Management Centres showed the work of the EU EIP group A4.2, Task 4 which deals with automation of road operator ITS. This presentation is a collaboration of Mihai Niculescu (ITS Romania) and Petri Antola, who gave the presentation.

After an overview on the work of Group A4.2, Task 4 Petri explained automation of TMC and autonomic systems.

Proposed high-level autonomic functions for TMCs:

- Self-management
- Self-optimizing
- Self-healing
- Self-configuration

plus self-learning and self-diagnostic as supporting autonomic functions for TMC

Petri presented a list of functions, which will benefit the most of automation and autonomic properties.

Automation scales for the system and the centre were shown:

- Automation from the system point of view (Automation scale from A0 – A4)
- Automation from the centre operator point of view (Automation scale from 0 – 5)

Petri showed examples of existing automation where the scales stated above are assorted to specific functions:

- Traffic Control Centre Hessen
- Spanish Traffic Management Centres
- Traffic Management Centres in Finland
- Traffic Scotland Systems
- Netherlands traffic management centres

For the assessment of benefits of automation deployment KPIs and operational KPIs were presented. Furthermore, the safety related benefits and the service quality related benefits for the society were shown.

Conclusion/Discussion:

- There are already experiences with automation in TMCs showing benefits such as operator workload reduction, increased efficiency in operations, increase of road network capacity and safety, and reduction of traffic delays.
- All systems presented have automated operations for one or more of the selected functions.
- Variation between automation level in systems within Europe
- High level automated system still requires operator
- There is potential for further advances of TMC automation in close cooperation with vehicle manufacturers.

Presentation: 3 - Petri Antola Experiences and benefits of automation in Traffic Management Centres

4) Cross-border Italian Highway - Technical aspects of monitoring, managing and maintenance, Saverio Mercurio, Tecnositaf

The Italian cross-border A32 Motorway links Turin to France through the Frejus tunnel. The Frejus Tunnel is 13 Km long and is managed jointly by the Italy and France.

Technical Aspects of Monitoring

Saverio explained the RMT Road management Tool, the technical aspects, the road management functions, the managed plants and sub-systems as well as the road system modules. Furthermore, the three participating centres were presented:

- Italian SITAF Motorway Traffic Control Centre in Susa (IT)
- Italian SITAF T4 Tunnel Traffic Control Centre in Bardonecchia (IT)
- French T4 Frejus Tunnel Traffic Control Centre in Modane (FR)

Managing: Traffic Information, Video Surveillance, Security, Tolling and Enforcement

Saverio presented the traffic management, the installed variable message signs, the heavy goods vehicles management, the CCTV Systems, the toll management and the fire detectors.

Fire detection: 500 vehicles stopped in 2019: monitoring trailer, transmission, silencer, tires, brakes, load compartment, refrigeration units. In addition, the detection of the vehicle dimensions is possible.

He furthermore showed examples of the use of CCTV systems for smoke detection, stopped vehicles and wrong way driver.

Maintenance

The maintenance consists of several services on the motorway. This includes weather management and winter operations, which is important in this mountain region.

Future deployments

For the future deployments in particular Smart Road and Wireless communication was presented:

Smart Road/ IoT:

- Infrastructure monitoring
- Traffic monitoring
- Weigh in Motion

Wireless communication

- Wireless Communication System DSRC
- Wireless Communication System WiFi in Motion – Traffic Models
- Wireless Communication System WiFi in Motion – Mobile App

Challenges:

- Technological development goes too fast compared to the time needed for tendering and installation of ITS. We need to take a different approach to technology.
- Cameras become increasingly important.
- More and more data are coming. This creates a challenge: how to deal with this vast amount of data, how to store it, what can we do with it. This will require a different organization.

- Decide on how to spend your money, where to put the money.
- Operators are responsible, but also become dependent on ITS systems, need 24/7 service, need monitoring systems for the systems. This is very costly.
- Timing of new technological developments is difficult, e.g. automated driving, C-ITS, etc.

Presentation: 4 - Cross-border Italian Highway, Saverio Mercurio

Session 2: Urban Traffic Management & Cross-border co-operation

5) Traffic Management Center in Vilnius, Lithuania, Aleksej Apanovič, Municipal Enterprise "Transport Agency", Vilnius, Lithuania

Aleksej started with an overview on the Traffic management system which includes traffic lights (about 280 sites), Variable message signs (13 VMS), the traffic monitoring system, the information system and the development of existing and the creation of new traffic corridors.

The traffic information system includes real time information to Waze and radio stations and traffic flow information.

The traffic monitoring system uses cameras and shows the traffic situation in real-time. The enforcement for red lights is carried out with 18 speed cameras.

Aleksey explained the traffic analysis in the centre, which is carried out mainly by the use of cameras, inductive loops and infrared detectors. He furthermore explained how the different counting systems (detectors) show different results.

Traffic accident data are shared with the emergency centre. ArcGIS app is used to analyse the traffic accident data in Vilnius.

Future plans and conclusions

Enhance and renew the equipment, e.g.

- Modernisation and development of video cameras
- Adaptation of traffic lights for the visually impaired
- Development of speed cameras
- Further automation of the sub-systems.
- Implementation of green corridors and a public transport priority system.

Make (historical) data of traffic lights etc available in open data, which can be used by app builders for new applications and thus new services to end-users

Presentation: 5 - Aleksej Apanovic, TMC Vilnius

6) ITM Finland's Helsinki Metropolitan Area Traffic Management Centre, Mika Jaatinen, Helsinki TMC

Mika first explained the situation in Finland with some figures on road network and the structure of the authorities and governmental companies responsible for traffic management. ITM Finland is the road

traffic management centre (approx. 70 people). In Finland 4 traffic centres exist (Helsinki, Tampere, Turku and Oulu) from which three first ones are operating 24h.

Objective of the Road Traffic Management Centres:

- To promote traffic safety and make traffic smoother
- Monitor prevailing traffic and road weather conditions
- Boost the management of incidents and minimising impacts on traffic
- Enhance the flow of information between authorities in case of traffic incidents

Then he explained the structure of ITM Finland and the operating model and showed some snapshots of road traffic information.

ITM 2020 – 2021 Vision and Actions

- Automation of TM processes ➔ Scalability!
- Capabilities for new data sources and analytics
- Co-operation with cities
- (Open) data and analysis platform Digitraffic™

He concluded that much data is available, but not used enough.

Presentation: 6 - Mika Jaatinen TMC ITM Finland

7) Cross-border cooperation: common management and information exchange on the MedTIS corridor, Bernard Fer, ASFA

Bernard first gave an overview on the MedTIS Corridor aiming at the coordinated deployment of ITS.

- Four Member States (France, Italy, Portugal, Spain), 22 road operators involved
- 5 years project 2014-2018, 43 M€ investment in MedTIS 2, 8,5 M€ EU funding
- A 6.800 km Corridor from Trieste to Porto with 7 cross-border interfaces, high volume of daily traffic, freight traffic and international road users.

Bernard presented an example for cross-border collaboration between France and Spain, where the operators of both sides of the border exchange information to see in real time the events occurring on the adjoining network:

- On-going events on the neighbouring network
- Real-time displays on the Variable Message Signs
- Visualization of the networks through diagrams
- Visualization of the CCTV set up on the A9 and AP-7 in the border area
- To see in real time the events occurring on the adjoining network

Bernard showed the MedTIS Flagship project: cross-border travel time, a new management dimension of cross-border information between Spain, France and Italy.

Travel time interoperability has been developed for France/Spain border and Italy/France border and is now operational.

Two 3-year-long projects with 400 k€ investments for a better level of service on critical network sites and with high socio-economic benefits, thanks to congestion reduction.

MedTIS KPIs for the cross-border travel time project:

- -50 accidents, -100 injured, -2 fatalities
- 1.130.000 hours saved

- 1.500 tons CO2 saved, 500.000 litre fuel saved
- 9,5 M€ per year savings in total, ROI < 5 years

Future Cross-border-projects

- Enlarged dissemination of cross-border travel times information (using on-board traffic information systems)
- More border interfaces to equip (new generation cross-border telecommunications networks to deploy, and to prepare a connected infrastructure welcoming connected and automated vehicles)
- More cross-fertilization between border operators

Conclusion/Discussion: The cross-border travel time project was very successful.

Presentation: 7 - Bernard Fer Cross-border cooperation MedTIS corridor

8) CHARM: automation of Traffic Management Centre, André Ingelse, Rijkswaterstaat

The CHARM project is a common project of Rijkswaterstaat and Highways England. The motivation for this collaboration are the similarities between the Netherlands and England in terms of problems, objectives, complexity and wishes. A change of systems also requires change in work processes.

Objectives

- Improved support traffic management
- Saving costs
- Scalability
- Flexibility

RWS wanted to buy off-the-shelf products (not tailormade) in order to become less dependent on one IT provider.

Scope of CHARM: Uniformity for all road traffic centres

National road administrators:

- All RWS Road Traffic Centers, incl. 1 national (VCNL)
- Helmond, 1st to join Government Data Center
- Road inspectors access via mobile application
- Connect roadside systems via interfaces

Regional road authorities like cities and Province:

- Link via standard interface

Out of scope:

- Replace roadside systems
- Work Planning (SPIN)

Future perspective:

- Systems, bridges and tunnels

The main users of CHARM are traffic operators traffic engineers and traffic officers.

Automation: From the levels of automation CHARM operates between levels 3 and 4:

- Autonomic hardware modules – A1
- Autonomic software modules – A2
- Autonomic subsystem – A3

- Autonomic system – A4

In level 3, the system makes decisions, but in case it has no decision-making capability, the decision is left to the user made aware of the dilemma by the system.

In level 4, the system is capable of making decisions in all situations, but the operator may take over if there is a special need.

Conclusion/Discussion

The system is one year live and no downtimes have occurred. However, the further roll out planned shows significant delay.

Problems encountered are the following:

- Experiences with communication in the project (US vs NL)
- Integration of traffic management system in brownfield situation
- Specifications not all up to date
- Freeze in current system …

Highest risks, based on the CHARM experience: planning, resources dedicated to project, functionality might be a mismatch with needs.

Presentation: 8 - André Ingelse, CHARM automation of Traffic Management Centre

13.11.2019 day two (09:00-12:45)

On 13th of November approximately 35 persons participated at the workshop.

Session 3a: Future technologies

9) Traffic Control Centre Hessen - Implementation of future technologies, Stephanie Cheung, Hessen Mobil Straßen- und Verkehrsmanagement

Stephanie started with an overview on the Hessen road network and existing ITS infrastructure. Hessen Mobil is the service provider of mobility for Hessen and thus responsible for planning, construction and maintenance.

Traffic Control Centre Hessen

- Traffic Control Centre Hessen in 24/7-operation
- Road traffic authority for motorways
- Intelligent control and information systems

Network Control with dWiSta. dWiSta are Variable message signs with congestion warning and travel time information:

- Network control via VMS on 35 intersections
- Travel time >10 minutes → route recommendation

Line Control System and Temporary Hard Shoulder Running: Intelligent control for safe and congestion free driving. Some 100 km Hard Shoulder Running in Hessen with a high security level due to situation-dependent usage and video observation. Furthermore, lane control system to avoid congestion, including rush hour lane.

Road Works Management in Hessen: Processes and data for safe and efficient traffic flow on roadworks. Examples: Roadworks slot management, DORA box for dynamic location of short-term road works, catalogue of traffic signs.

Future Technologies for Connected Automated Traffic

Innovation strategy for Future Mobility

- Potential for improving traffic safety and avoiding congestion, thanks to the connection between intelligent street and intelligent vehicles and automation.
- Developing and testing of cooperative automated traffic systems in Hessen in collaboration with industry and sciences for some time.

Cooperative Services

- Cooperative ITS Corridor
- C-Roads/ C-Roads Urban Nodes

Automated Driving

- aFAS (finished) project (fully automated, unmanned): warning trailer following vehicle in front
- IMAGinE (until 05/2022): intelligent automation of manoeuvres – cooperative risk prevention in real-time

Evolution Steps of Road Transport System: collective ➔ coordinated➔ cooperative➔ automated

Extension of Traffic Control Centre Hessen: Realignment to new challenges (automated driving, roll-out of C-ITS)

Traffic Control Centre Germany: From 2021 on, the Federal Republic will take over responsibility for the motorways with an own organisation. In this respect the TCC Hessen will become the superordinate TCC Germany.

Presentation: 9 - Stephanie Cheung, TCC Hessen Future Technologies.pdf

10) Traffic Management Centres of Egnatia Odos Motorway: Current capabilities and future prospects in the era of ITS, Dr. Athanasios Saramourtsis – Egnatia Odos S.A.

Athanasios started his presentation with an overview on "*Egnatia Odos Motorway*" including the ITS infrastructure. The motorway network is 900 km long (including vertical axes).

Athanasios furthermore showed two examples for the upgrade of a TMC.

TMC contains:

- TMS
- SCADA control and automation system
- CCTV management system
- ICT management system
- Radio comm

Classic technologies at TMC:

- Upgrade TMS functionalities (harmonize events management, add wide area traffic scenarios)
- Upgrade CCTV capabilities (new video walls, new HD cameras, ...)
- Upgrade ergonomics of control room

Athanasios furthermore showed two examples for the upgrade of a TMC.

New Technologies at TMCs:

- Non-intrusive data collection tools: Video Content Analytics (2 in 1)
- Innovative communication tools: Mass notifications & automatic critical communications
- I2V - New traffic info dissemination tools: "Soft" VMS concept

Optimise TMC Communications:

- Launch instant notifications
- Multiple communication channels (SMS, voice, e-mail, fax)
- Virtual geofence (push smart notifications)
- Optimise resource management

What's Next:

- C-ROADS Greece starting 1-1-2020
- ITS-G5 & Hybrid technologies will be implemented & tested
- R-ITS-S (stationary + mobile units) in 2 pilot sites: Attiki Odos Tollway (peri-urban), Egnatia Odos Motorway (rural)

Presentation: 10 - Athanasios Saramourtsis, TMC of Egnatia Odos Motorway

Discussion Session 3a:

Declare several zones on motorway, pushing specific messages to road users. Users need mobile device. Egnatia will probably cooperate with a national IT company.

Which data from vehicles would you like to have for TMC? We have the opportunity (through C-ITS) to get a lot of data, mainly CAN data, but we don't know exactly yet what data we want and how we can use it.

How will C-ITS change TMC? From infra-based to vehicle-based system.In the future we will be able to send and receive much better information directly to and from the vehicle/driver. Communication is currently mainly one-directional, will then become bi-directional.

TMC will be data driven. What data will be needed from vehicles? New vehicles can send a message about slippery road, then the TMC can send a warning message to road users in that section. Validation/verification through numbers, and possibly smart cameras. But maybe we need more personnel in the TMC.

There will be layers of filters of intelligence and at a certain moment TMC operator will get into the picture. So probably no need for more staff in TMC.

Session 3b: Incident Warning & Management

11) Advanced incident management, a multi-party process, Jan Willem Tierolf, Rijkswaterstaat

Incident Management: The whole range of measures to clear the road to resume normal flow as soon as possible after an incident has taken place.

How to organise IM? → integrated approach

Incident management is very important in the Netherlands, started already in the nineties. 25% of congestion caused by incidents.

Effects: 15 minutes faster for pass cars and 60-90 minutes faster handling → leading to 35% reduction of congestion (150 million euro societal benefits)

IM: the power of coordination, cooperation with approx. 10 different actors (road operator, police, towing companies, ambulance services, fire departments etc.)

2 different schemes: for cars and trucks

Order of priority:

- Safety of the IM emergency workers
- Traffic Safety
- Assistance to the victims
- Evidence collection
- Restoring traffic flow
- Salvaging cargo/vehicle

Developments in IM:

- Digitalization of evidence collection through cameras
- Traffic offers get a license to give penalties
- Deep learning on floating car data → predict accident prone areas

Challenges:

- How to deal with electric vehicles?
- More and more trucks with automated gear box, how to deal with this?

Presentation: 11 - Jan Willem Tierolf, Advanced incident management, a multi-party process

12) Incident Management; Real-Time detection and impact assessment, Ruud van den Dries, MAPtm

Ruud gave an overview on the Dutch road network and explained the problems (i.e. 25-300 km traffic jam altogether in the Netherlands every day) of congestion and the main reasons (heavy traffic, road works, weather, incidents/accidents, events etc.) for the traffic jams. He furthermore explained the economic consequences of congestion.

To relieve the situation, changes in some cases are impossible or difficult (road works, weather, events), but to improve the situation due to incidents and accidents is possible with improved incident management.

Incident detection:

Rijkswaterstaat uses a lot of different systems:

- Detection loops
- Automatic incident detection
- Traffic officers/road marshals
- Cameras
- FCD
- etc.

and systems like WAZE, TomTom, HERE, governmental feeds.

Ruud shows how information from road users via WAZE can be used in the traffic management Centre to display:

- Brake down vehicles
- Accidents
- Dangerous situations

The system gives priority to handle the incident (through algorithm).

New developments:

- **Videos**: To include video information from the location. The TMC can assist the road marshal so that he can more easily choose the right measures and emergency services. As a consequence, the incident can be handled faster and result in less lost traffic hours.
- **sIM** – incident management within a city network. A pilot is carried out with city of Amsterdam. The focus is laid on crowed-sourced data, but also based on data from different internal services.

The road marshal has an app installed on his mobile phone to provide data to the TMC.

Presentation: 12 - Ruud van den Dries, Incident Management; Real-Time detection and impact assessment

Discussion Session 3b

How to deal with electric vehicles and with trucks with automated gear boxes?

The participants had no experience in this field. It was proposed to ask Norway, since Norway has the highest level of electric vehicle. Possibly also a role for OEM and EC?

OEMs should provide this information, linked to Vehicle Identification Number (VIN). This should be discussed with the EC.

Good example of Waze, getting data from 'external sources'. Waze is partly Google, but Google will also add functions. Will this mean that Waze will be discontinued in the future?

We don't know to what extent Google is aware of EU regulation about providing data to the NAPs. How to deal with organisations like Google? The EC should take their role.

Session 4: Co-operation in traffic management (public-private)

13) The role of traffic information service providers in an autonomous driving world, Stephanie Leonard, TomTom

Stephanie opened her presentation with the history of TomTom from 1991 until today. She explained the situation today including highly accurate maps, navigation software, real-time traffic and services. TomTom deals with 5 billion traffic measurements a day. EV service includes 45.000 EV charging stations globally.

Then she explained the situation in the future:

Drivers of change:

- Human driving → mixed driving → autonomous driving
- Navigation → real time traffic info → parking → C-ITS services
- Instruct drivers outside and inside vehicles → control vehicle systems

- From SD map → HD map

Developments for the future:

- Future possible Automated Driving Service:
  - Road Clearance service: when you have to take back control of the vehicle when road conditions become tricky (heavy traffic, complex road works, bad weather, …)
- Who is going to be responsible for routing of AVs? The service provider? The road authority? The driver?
- Mapping: leading is HD map. Top level map needed for automated driving, not human readable. Maps are not dependent on bad weather, lining, darkness, etc. HD maps give cars most reliable eyes.

Car to cloud to car: complete map ecosystem for self-driving cars. No 5G needed.

Fast map delivery with AutoStream.

How can public input work to Road Clearance service?

Presentation: 13 - Stephanie Leonard, The role of traffic information service providers in an autonomous driving world

14) TM 2.0: Traffic Management and the agreement to cooperate, Dr. Johanna Tzanidaki, ERTICO ITS Europe

Johanna first gave an overview on ERTICO and Traffic Management 2.0. TM2.0 organisation has 43 members; half of them are from the public sector.

Principles of TM 2.0:

1. Collaboration and trust
2. Alignment of information to drivers and consistency
3. Understanding among stakeholders

Then she explained the added value for stakeholders, e.g. City administrators/traffic managers (avoid congestion and emissions etc.), drivers (avoid congestion, improve safety etc.) and traffic information service providers (provide best route options, provide information and solutions etc.)

Understanding among stakeholders is important → win – win -win

Socrates is 'proof of concept' of TM2.0.

Presentation: 14 - Johanna Tzanidaki TM 2.0 Traffic Management and the agreement to cooperate

15) How to integrate commercial information services into Traffic Management? Status report on SOCRATES 2.0, an innovative, large-scale deployment of Interactive Traffic Management, Peter Lubrich, BASt and Ruud van den Dries, MAPtm

Peter and Ruud presented the project SOCRATES 2.0 (System of Coordinated Roadside and Automotive Services for Traffic Efficiency and Safety). It is a European project where road authorities, service providers and car manufacturers cooperate.

Traffic Management today might conflict with the private sector tools. Increasing influence of private tools/apps on traffic system can be observed.

How to integrate public sector traffic management into private systems?

Getting TM data into the vehicle (e.g. lane advice in BMW)

Public Traffic Management vs Private Service Providers: have to work together.

Socrates 2.0 project: cooperation models

- No common: informing each other
- Co-creation: 1 commonly agreed 'truth' ('free' or 'obligation')

Level of commonality vs. level of detail (situational, operational, tactical, strategic)

SOCRATES includes 4 Pilots in Amsterdam, Antwerp, Copenhagen, Munich.

In particular, the Pilot in Antwerp was presented in detail. There are two tunnels addressed with this pilot, the Kennedy Tunnel (free of charge) and the Liefkenshoek tunnel (toll tunnel). Before the trial 70% of the road users drove through the Kennedy Tunnel which led to congestion and only 30% through the Liefkenshoek tunnel. The objective was to come to a more even distribution. With the help of this pilot the respective figures changed to 60% Kennedy Tunnel and 40% Liefkenshoek tunnel.

Rerouting is carried out via Be-Mobile/Flitsmeister or BMW in-car system when speed gets too low or distribution too uneven. 2500 users currently. Users receive a voucher when rerouted.

Presentation: 15 – Peter Lubrich, Ruud v.d. Dries, Status report on SOCRATES 2.0

Discussion Session 4

Can you give individual guidance to drivers?

TM2.0 is going in that direction. However, not only to the driver, but maybe before that already, to the individual, if it is also linked to MaaS.

Better already start cooperating between public and private sector, because once AV become common practice, drivers will be directed through algorithms.

Role of TMC in future: Role will remain, in order to keep the system working. Tools to be used will change.

Any specific considerations with respect to e.g. dangerous cargos? In TM2.0 this topic might be a bit underestimated, might need more attention.

Not likely that there will be 'premium navigation services' giving shorter/faster routes to people who pay more. But desirable routes might be incentivized by lower costs, such as the Antwerp example.

Conclusion

New technologies

A number of presentations showed the implementation and potential of new technologies for TMCs. For example, North Rhein-Westphalia is currently using Floating Vehicle Data (FVD) for Traffic Management for rerouting and dynamic lane management. In the Netherlands a Proof of Concept is carried out with Smart Cameras, which have shown an annual savings potential of 2700 staff hours for the Netherlands. However, this development does not lead to a staff reduction but to an increased efficiency, as it enables the road authority to achieve more with the same staff. C-ITS is already demonstrated in Hessia and plans exist for Greece (Egnatia Odos), also in the framework of C-ROADS Greece. The benefits are clear: traffic managers will have access to more information from the vehicles and at the same time will also have the possibility to communicate directly with the drivers/vehicles. In Belgium and the Netherlands information from road users is collected for Incident Management purposes. Through WAZE, information about broken-down vehicles, accidents and dangerous situations becomes available to the TMCs. This is an additional channel of information, supplementing other systems like AID, detection loops, cameras and FCD.

Data

Many of the new technologies will result in more data, for example C-ITS. But the question is for example what type of data should be collected from the vehicles (Floating Vehicle Data) and for what purpose. Whatever the answer, data should be made accessible through open data platforms and National Access Points, in order to facilitate the re-use of data and to allow app builders to develop new applications and thus new services to end-users. This does not only apply to FVD, but to all kind of data (both real-time and historical), such as traffic light signals, accident data, etc.

Challenges

During the workshop a number of challenges were addressed, both in presentations and during the discussions. Technological developments go too fast compared to the time needed for tendering and installation of ITS. New ways have to be found on how to deal with these fast-changing technologies. TMCs also have to think about how to deal with the ever-increasing amount of data that is becoming available to them. What data is needed, and how can it be used? Which data must be stored, and how should it be stored? The new ITS systems and the associated data coming with it, will require different processes and different qualifications of the staff working at the TMCs.

With respect to incident management it was noted that none of the participants in the workshop has much experience with how to deal with the salvage of the various types of electric vehicles and trucks with different kinds of (automatic) gearboxes. Exchange of best practices would be considered very useful. It is also believed that closer cooperation with vehicle manufacturers will have potential for further advances of TMC automation.

Furthermore, the question was raised who will be responsible for the routing of autonomous vehicles? Is it the service provider or is this the responsibility of the road authorities (i.e. the Traffic Management Centres)? And what are the possibilities for the drivers to influence the rerouting?

Changing role of TMC?

Public and private actors in the Traffic Management and Traffic Information domain should trust each other and it should be clear that all parties should benefit from cooperation. If not, there is no business case for this public/private cooperation in TM2.0. Furthermore, it can be noted that TM2.0 is not only for real-time rerouting, but also can be applied in relation to Mobility as a Service (MaaS). It can be concluded that the role of TMCs will remain, since traffic management will be needed to keep the traffic system working. However, the tools for traffic management, and the interaction with other parties will change.

Annex 1: Agenda Workshop "Cross-Corridor Cooperation Workshop – Future Challenges for Traffic Management Centres"

Tuesday, 12th November 2019, 12:45 – 17:00

Opening of the Workshop

Welcome on behalf of the host and organisers Orestis Giamarelos, BASt Roberto Arditi, EU EIP – EWC, Dieter Sage, NEXT-ITS

Session 1: Automation in Traffic Management Centres

- Using Vehicle-generated Data for Optimisation and Automation of Traffic Management Dr. Jens Ansorge Landesbetrieb NRW, Germany
- The use of Smart Cameras and Artificial Intelligence in Dutch Traffic Management Centres, Johan van Eyk Rijkswaterstaat, the Netherlands
- Experiences and benefits of automation in Traffic Management Centres, Petri Antola Finnish Transport Infrastructure Agency, Finland
- Cross-border Italian Highway - Technical aspects of monitoring, managing and maintenance, Saverio Mercurio Tecnositaf, Italy

Discussion

Coffee Break

Session 2: Urban Traffic Management & Cross-border co-operation

- Traffic Management Center in Vilnius, Lithuania Aleksej Apanovič Municipal Enterprise "Transport Agency", Vilnius, Lithuania
- ITM Finland's Helsinki Metropolitan Area Traffic Management Centre, Mika Jaatinen Helsinki TMC, Finland
- Cross-border cooperation: common management and information exchange on the MedTIS corridor, Bernard Fer ASFA Autoroutes, France
- CHARM: automation of Traffic Management Centre André Ingelse Rijkswaterstaat, the Netherlands

Discussion

17:00 End of Day 1

Wednesday, 13th November 2019, 09:00 – 12:45

Session 3a: Future technologies

- Traffic Control Centre Hessen - Implementation of future technologies, Stephanie Cheung, Hessen Mobil, Germany
- Traffic Management Centres of Egnatia Odos Motorway: Current capabilities and future prospects in the era of ITS, Dr. Athanasios Saramourtsis, Egnatia Odos S.A., Greece

Discussion

Session 3b: Incident Warning & Management

- Advanced Incident Management, a multi-party process, Jan Willem Tierolf, Rijkswaterstaat, the Netherlands
- Incident Management; Real-Time detection and impact assessment, Ruud van den Dries, MAPtm, the Netherlands

Discussion

Session 4: Co-operation in traffic management (public-private)

- The role of traffic information service providers in an autonomous driving world, Stephanie Leonard, TomTom, Belgium
- TM 2.0: Traffic Management and the agreement to cooperate, Johanna Tzanidaki, ERTICO ITS Europe, Belgium
- How to integrate commercial information services into Traffic Management? Status report on SOCRATES 2.0, an innovative, large-scale deployment of Interactive Traffic Management, Peter Lubrich, Federal Highway Research Institute (BASt), Germany and Ruud van den Dries, MAPtm, The Netherlands

Discussion

Conclusion

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Annex 2: List of Participants

First Name	Last Name	Organisation
Adriano	Carvalho	Ascendi
Aleksej	Apanovič	Municipal Enterprise “Transport Agency”, Vilnus, Lithuania
André	Ingelse	Rijkswaterstaat
Arne	Lindeberg	Trafikverket
Athanasios	Saramourtsis	Egnatia Odos S.A
Bernard	Fer	ASFA Autoroutes
Britta	Böhnke	Autobahndirektion Südbayern
Caterina	Rittà	Ascendi
Dieter	Sage	Logos
Franck	Rivey	Sanef
Hanfried	Albrecht	AlbrechtConsult GmbH
Holger	Drees	BASt
Jan Willem	Tierolf	Rijkswaterstaat
Jens	Ansorge	Landesbetrieb NRW
Jessica	Hegewald	BASt
Johan	van Eyk	Rijkswaterstaat
Johanna	Tzanidaki	ERTICO ITS Europe
Jörg	Dreier	FEDRO (Federal Road Office)
Jörg	Freudenstein	AlbrechtConsult GmbH
Jörg	Dubbert	VDI/VDE-IT
Karolina	Hedberg	Viati / Swedish Transport Adminitration
Louis	Hendriks	Rijkswaterstaat
Lucian	Ilina	Romanian National Company for Road Infrastructure Administration
Mari-Liis	Sepp	Estonian Road Administration
Marion	Mayer-Kreitz	Ministerium für Verkehr BW
Martin	Eisele	Autobahndirektion Südbayern
Matti	Strohschein	AlbrechtConsult GmbH
Mika	Jaatinen	Helsinki TMC
Nuno	Belgas	Ascendi
Orestis	Giamarelos	BASt
Paul	Wadsworth	Capita
Peter	Gusia	BASt
Peter	Lubrich	BASt
Petri	Antola	Finnish Transport Infrastructure Agency
Roberto	Arditi	SINA
Ronald	Jorna	Mobycon
Ruud	van den Dries	MAPtm
Saverio	Mercurio	Tecnositaf
Stephanie	Cheung	Hessen Mobil
Stephanie	Leonard	TomTom
Thomas	Roslyng	Danish Road Directorate
Timo	Hoffmann	BASt
Tobias	Reiff	BASt
Torsten	Geissler	BASt