Reference Handbook for harmonized ITS Core Service Deployment in Europe

Annex A:

Deployment References

EU EIP European ITS Platform

Co-financed by the Connecting Europe Facility of the European Union

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Annex A: Deployment References

List of Abbreviations

Abbreviation	Description
A2	Activity 2
ANPR	Automatic Number-Plate Recognition
BP	Best Practice
CCAM	Cooperative Connected and Automated Mobility
CBA	Cost Benefit Analysis
CEF	Connecting Europe Facility
C-ITS	Cooperative Intelligent Transport System
CPU	Central Processing Unit
C-ROADS	The C-Roads Platform is a joint initiative of European Member States and road operators for testing and implementing C-ITS services in light of cross-border harmonisation and interoperability. (https://www.c-roads.eu/platform.html)
DG	Deployment Guideline
EU EIP	EU ITS Platform
ERA	ERA - Emergency Refuge Area (safe haven)
ERT	Emergency Road Telephone
F&L	Freight and Logistics
F&LS	Freight and Logistics Services
FM	Frequency Modulation (FM broadcast band)
GIS	Geographic Information Systems
HGV	Heavy Goods Vehicle
Inter-modal	A transport system that allows at least two different modes, and/or means of transport, to be used in an integrated manner (in combination) in a door-to-door transport chain. This necessarily involves transferring from one mode (or means) of transport to another. This usually takes place at modal interchanges. The development of a seamless web of integrated transport chains linking road, rail and waterways (and/or also linking different means of transport) leads to improved flexibility, quality, and cost effectiveness.
ICT	Information and Communication Technology
ISO	International Organization for Standardization (http://www.iso.org/)
ITS	Intelligent Transport System
ITS Core Service	The ITS Core Service is an ITS Service as described with its core features in this Reference Handbook. In distinction to this, an ITS Service is a service that is related to an ITS Core Service in terms of its purpose and characteristics, but which may differ in its characteristics or may be equipped with additional characteristics.
LoQ	Level of Quality
LoS	Level of Service (Traffic condition)
LTE	Long Term Evaluation (fourth generation mobile radio standard)
M&D	Monitoring and Dissemination
MDM	Mobility Data Marketplace
Multimodal	A transport system that offers at least two different modes and/or means of transport to be used in a parallel manner in a door-to-door transport. The policy principle is not to stick to one single mode/means of transport information but also offering alternative means of travel.
NAP	National Access Point
OBU	On Board Unit (ISO 17438-4:2019: Vehicle ITS Station)

OE	Operating Environment
OEM	Original Equipment Manufacturer (Vehicle manufacturer)
POI	Points Of Interest
PT	Public Transport
RDS-TMC	Radio Data System Traffic Message Channel
RSU	Road Side Station (ISO 17438-4:2019: Roadside ITS Station)
RTTI	Real Time Traffic Information
TEN-T	Trans European Network - Transport
TTI	Traffic and Travel Information
TTIS	Traffic and Travel Information Services
TISA	Traveller Information Services Association (http://www.tisa.org/)
TM	Traffic Management
TMS	Traffic Management Services
TMC	Traffic Message Channel
TPEG	Transport Protocol Experts Group
UITP	International Association of Public Transport
V2X	Vehicle to Everything
VMS	Variable Message Sign

1 Annex A: Deployment References

The “deployment references” annex of the Reference Handbook for harmonized ITS-Core Service Deployment in Europe contains all the filled templates collected, containing information from ITS deployments mainly coming from the CEF ITS Corridors, with the aim to provide the user with practical examples in the implementation of each service, as well as important information for the planning and implementation process, such as lessons learnt and observed benefits.

The deployment references collected and presented in the next chapters are grouped by ITS service and sorted under the following three main categories:

— **TTIS - Traffic & Travel Information Services**
— **TMS - Traffic Management Services**
— **F&LS - Freight & Logistic Services**

1.1

TTIS - Traffic and Travel Information Services

1.1 TTIS - Traffic & Travel Information Services

1.1.1 TTIS-01 Forecast and Real-time Event Information

1.1.1.1 ArbIS (Arbeitsstellenintegrationssystem)

GENERAL INFORMATION	
Name of service/system/project	ArbIS (Arbeitsstellenintegrationssystem)
Name of operator/organisation	Bavarian Road Administration, Zentralstelle fuer Verkehrsmanagement (ZVM)
Service delivery	☒ Public ☐ Private
Mainly applicable Deployment Guideline	TIS-DG01_Forecast and Real Time Event Information
Other relevant Deployment Guideline(s)	TIS DG-02_Traffic Condition and Travel Time Information
Contact for more information	zvm@abdsb.bayern.de

GEOGRAPHICAL ASPECTS	
Country	Germany
Region of implementation	Bavaria
Corridor(s) or Network(s) concerned	URSA MAJOR 2

ITS SERVICE DESCRIPTION	
General Objectives	☒ Reduction of congestion ☒ Increase of safety ☒ Reduction of environmental damage ☐ Protection of the road infrastructure ☐ Increase traveller comfort ☒ Other: Provide data on planned and current roadworks
Specific Objectives	☐ Change the distribution in time of transport in order to achieve a more even allocation, avoiding peaks (access restrictions, fees) ☐ Change the distribution of transport in space in order to achieve a more even distribution on the network, and prevent "wrong vehicles on wrong places" (traffic control, traffic management, traffic information, access restrictions) ☐ Change the composition of vehicles on a certain piece of infrastructure (access restrictions, fees) ☐ Manage the flow on a given road section in order to reduce speed variation and thus improve the capacity and reduce the risk of incidents ☐ Manage access to a given road section in order to prevent disturbances and reduce the risk of incidents (e.g. ramp metering) ☐ Increase the speed on the link and thus increase capacity (throughput) ☒ Reduce the risk of incidents and traffic disruptions through better informed infrastructure users (traffic and traveller information) ☐ Reduce the consequences from disruptions through fast countermeasures (incident response time) ☐ Reduce traffic volumes through redistributing transport between transport modes ☒ Other: Reduce general traffic disturbances through better coordination of the timeslots for planned roadworks

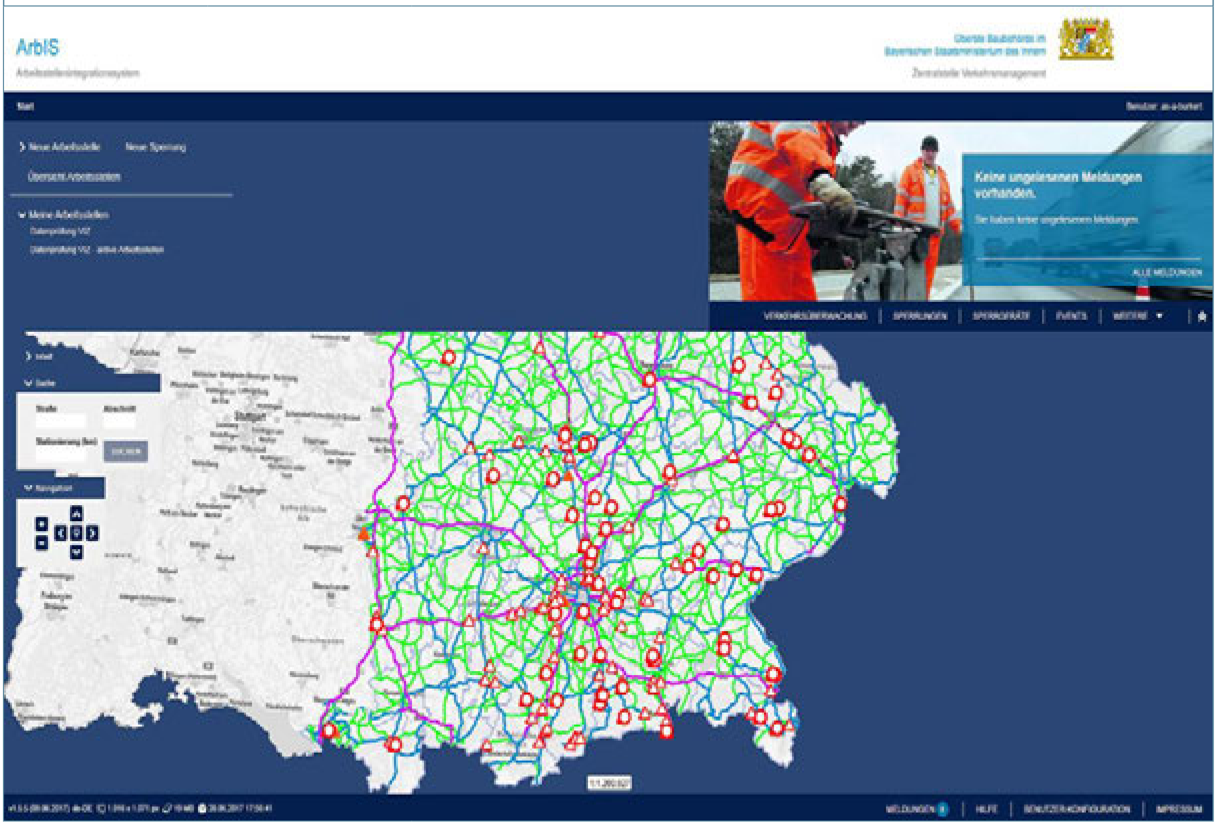
Short narrative description of your best practice including e.g. geographical dimension, numbers, target group like HGV or passengers, costs etc.	With around 50.000 short term roadworks and about 100 large scale roadworks per annum a coordinated management of the planning processes and the execution periods is imperative if the correlated traffic impact is to be minimised. Hence the development of the roadworks management system ArbIS was initiated in summer 2012 and completed in April 2016. ArbIS comprises the road network of the German region Bavaria managed by the Ministry of the Interior, for Building and Transport and holds all relevant data about timing, activity status and roadworks layout regarding traffic impact. Roadworks directly managed by municipalities are not yet included. ArbIS incorporates several core principles aimed at highest data quality and correctness as these information sets are not only utilised for internal coordination but also provided, via other IT systems, as traffic information. One core functionality the system provides is the traffic impact assessment for each phase of a construction site. This feature allows to assess the likely traffic impact of a specific roadworks layout during the planned period and suggests, if required, a different date for executing the work. Another principle comprises the role of the coordinator, a position which will assess the correlated effects of all roadworks in a region planned to be executed in parallel. The goal is to minimise the combined impact of all roadworks on the traffic flow and suggest changes in execution dates where necessary. Thirdly, the system is designed to be operated by the personnel directly concerned with the different steps of managing a roadworks life cycle. This stands in contrast to most IT Systems currently used as those are normally operated by a selectee who incorporates data and information from the personnel executing the respective working steps. The goal is to acquire the best possible data quality and hence the original data sources are asked to surrender the information. ArbIS is designed as central on-line data base with clients operating directly in desktop and mobile browsers. The former is utilised to surrender planning details and other complex information, the latter to submit data about the real activities directly on-site. Concerning current activity status, also especially equipped warning trailers can be used to automatically generate current activity data for a roadwork site. ArbIS holds all relevant information on roadworks from the planning phase to the definitive closure of the measure based on phases of the roadworks in question. These data are used for constant information of all concerned parties in the different organisational entities and already supported the coordinated planning of major roadworks for 2017 back in Autumn 2016. With the full system rollout concluded by end of 2017, 2018 will see the fully fledged operation for roadworks of short and long duration.
Relation with national access point set up according to EC Delegated Regulations	☒ Provide information to the national access point ☐ Receive information from the national access point ☐ No connection to the national access point
Information provision to end users	☐ Web portal ☐ Phone app ☐ VMS ☐ In-vehicle information ☒ Other: indirectly, via VIZ system which features a website (www.bayerninfo.de) and will also provide these data to the MDM

IMPLEMENTATION ASPECTS	
Year of implementation (+ end date of measure if applicable)	2012-2016
Technical description	Central data base system with Web-browser based clients holding all information relevant to the coordinated planning of roadworks and relevant for the provision of information on the current implementation status utilised for internal information and forming the basis for related traffic information towards the end user.

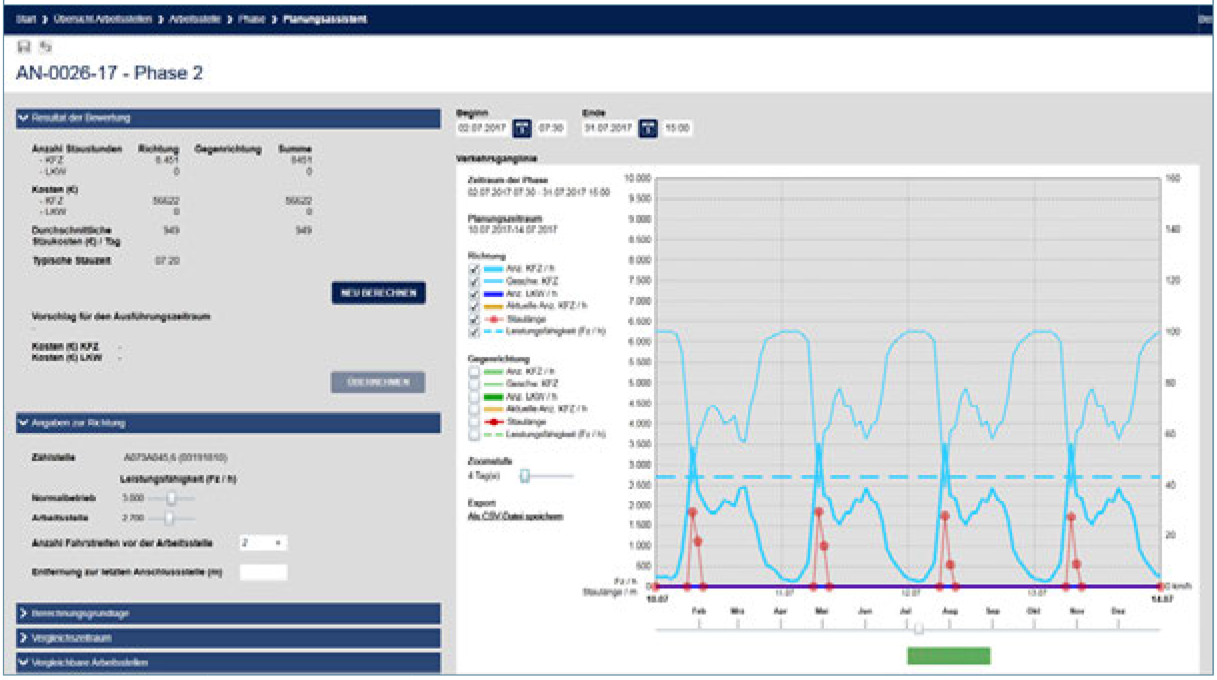
Lessons learnt / factor of success / topics considered as good practice (technical, legal, organisational, financial)	Factors of success include, among others: — Discussion of requirements in working groups comprising all relevant entities and user viewpoints during specification is advisable, but user opinions should be considered thereafter as well — Avoidance of misunderstandings during system development by directly participating in the SCRUM-scheme of the contractor — Discussion and elaboration of supporting organisational schemes for implementation in each concerned entity is key for a system requiring a large user base such as ArbIS. — Existing systems should be used depending on their capabilities but should also consider any special requirements. This means, that the further improvements of these systems shall be coordinated with any systems using these services. — Objections towards the implementation of the system in current processes should be expected but can be overcome by a mix of technical improvements and organisational consulting.
Impacts assessment / results (if available)	The ArbIS system will be in full use from 2018 on, impact assessment will be commenced based on user feedback constantly thereafter. A dedicated working group for improvements in place.

ILLUSTRATIONS

vArbIS Frontpage



Traffic impact assessment during planning phase



REFERENCES	
Documentation available on the project	Internal
Web link	Only accessible from internal network, roadwork data provided to www.bayerninfo.de

1.1.1.2 Baustelleninfo digital Rheinland-Pfalz

GENERAL INFORMATION	
Name of service/system/project	Baustelleninfo digital Rheinland-Pfalz
Name of operator/organisation	Ministry for Transport of Rheinland-Pfalz (MWVLW)
Service delivery	☒ Public ☐ Private
Mainly applicable Deployment Guideline	TIS-DG02 - Forecast and Real Time Event Information
Other relevant Deployment Guideline(s)	DTX-DG01 - DATEX II
Contact for more information	Reiner Dölger, Reiner.Doelger@MWVLW.RLP.de

GEOGRAPHICAL ASPECTS	
Country	Germany
Region of implementation	Rheinland-Pfalz
Corridor(s) or Network(s) concerned	The whole TEN-T network of Rheinland-Pfalz, URSA MAJOR neo

ITS SERVICE DESCRIPTION	
General Objectives	☐ Reduction of congestion ☒ Increase of safety ☒ Reduction of environmental damage ☐ Protection of the road infrastructure ☒ Increase traveller comfort ☐ Other
Specific Objectives	☐ Change the distribution in time of transport in order to achieve a more even allocation, avoiding peaks (access restrictions, fees) ☒ Change the distribution of transport in space in order to achieve a more even distribution on the network, and prevent “wrong vehicles on wrong places” (traffic control, traffic management, traffic information, access restrictions) ☒ Change the composition of vehicles on a certain piece of infrastructure (access restrictions, fees) ☐ Manage the flow on a given road section in order to reduce speed variation and thus improve the capacity and reduce the risk of incidents ☐ Manage access to a given road section in order to prevent disturbances and reduce the risk of incidents (e.g. ramp metering) ☐ Increase the speed on the link and thus increase capacity (throughput) ☐ Reduce the risk of incidents and traffic disruptions through better informed infrastructure users (traffic and traveller information) ☐ Reduce the consequences from disruptions through fast countermeasures (incident response time) ☒ Reduce traffic volumes through redistributing transport between transport modes ☐ Other
Short narrative description of your best practice including e.g. geographical dimension, numbers, target group like HGV or passengers, costs etc.	The idea of the project is the central, digital consolidation of roadwork information for the state region of Rheinland-Pfalz. The system will process and provide information on road works on the entire TEN-T network of Rheinland-Pfalz. The goal is to make all roadwork information available to all federal state road operators and data service providers free of charge via the German National Access Point MDM (Mobility Data Marketplace). The target group of the project consists of road authorities in RP, theirs neighbours and navigation service providers, who in turn provide the data for road users.
Relation with national access point set up according to EC Delegated Regulations	☒ Provide information to the national access point ☐ Receive information from the national access point ☐ No connection to the national access point, not yet
Information provision to end users	☒ Web portal ☒ Phone app ☐ VMS ☒ In-vehicle information ☐ Other: LED information display (single-row bar)

IMPLEMENTATION ASPECTS	
Year of implementation (+ end date of measure if applicable)	2018
Technical description	To allow the integration of all traffic regulations in one data set, the federal state RP installed a system called “SPERRINFOSYS” which enables its users – typically road operators or traffic authorities - to implement the full workflow or planning, issuing and managing traffic regulation orders due to road works. The systems administrators create user profiles for traffic authorities, which allow them to edit data in their area of responsibility via a graphical user interface. The system supports information regarding — The exact location — The planned start and end time of the road work — Availability of lanes — The width of available lanes — Official alternative routes The Information is shared as a publication on the MDM, Germany’s national access point for traffic data, via a corresponding DATEX II profile and published on the federal state mobility platform Mobilitätsatlas.

Lessons learnt / factor of success / topics considered as good practice (technical, legal, organisational, financial)	This solution did not only make information available for road users, but for different authorities of federal states or other neighbouring road operators. The system allows different authorities to plan road works in a coordinated way depending on the upcoming status of the respective re-routing. Previously, planned road works were only announced locally and without digital network reference, preventing road users from making educated short- and long-term pre-trip decisions
Impacts assessment / results (if available)	The impact of the system is hard to put in exact numbers of users from the administrator's point of view as usage of the available data depends mainly on the navigation service providers. The road works information will be published on the currently developed "Mobilitätsatlas", a multi.modal information platform. It will cover approx. 18.000 km of roads in the jurisdiction of the Land. Cities and other authorities are supported and encouraged to using the system for their network, without extra cost.

ILLUSTRATIONS

press conference, source: ministry of economics of rhineland-palatinate

REFERENCES

Documentation available on the project	
Web link	https://ursamajor.its-platform.eu/highlights/umneo-roadworks-information-digitalisation-rheinland-pfalz-%E2%80%93-press-conference-minister

1.1.1.3 Traffic information LED display (single row)

GENERAL INFORMATION

Name of service/system/project	Traffic information LED display (single-row)
Name of operator/organisation	Ministry of Transport Baden-Württemberg
Service delivery	☒ Public ☐ Private
Mainly applicable Deployment Guideline	TIS-DG02
Other relevant Deployment Guideline(s)	
Contact for more information	Michael Trees Ministry for Traffic of Baden-Württemberg Department for road duty and traffic management Hauptstätter Straße 67 D-70178 Stuttgart Phone: 0049 - (0)711/231-3621 Mail: michael.trees@vm.bwl.de

	GEOGRAPHICAL ASPECTS
Country	Germany
Region of implementation	Metropolitan area of Stuttgart
Corridor(s) or Network(s) concerned	All motorways, junctions, interchanges mentioned in the region above

	ITS SERVICE DESCRIPTION
General Objectives	☒ Reduction of congestion ☒ Increase of safety ☐ Reduction of environmental damage ☐ Protection of the road infrastructure ☒ Increase traveller comfort ☒ Other: real time traffic information
Specific Objectives	☐ Change the distribution in time of transport in order to achieve a more even allocation, avoiding peaks (access restrictions, fees) ☐ Change the distribution of transport in space in order to achieve a more even distribution on the network, and prevent "wrong vehicles on wrong places" (traffic control, traffic management, traffic information, access restrictions) ☐ Change the composition of vehicles on a certain piece of infrastructure (access restrictions, fees) ☒ Manage the flow on a given road section in order to reduce speed variation and thus improve the capacity and reduce the risk of incidents ☐ Manage access to a given road section in order to prevent disturbances and reduce the risk of incidents (e.g. ramp metering) ☐ Increase the speed on the link and thus increase capacity (throughput) ☒ Reduce the risk of incidents and traffic disruptions through better informed infrastructure users (traffic and traveller information) ☐ Reduce the consequences from disruptions through fast countermeasures (incident response time) ☐ Reduce traffic volumes through redistributing transport between transport modes ☐ Other
Short narrative description of your best practice including e.g. geographical dimension, numbers, target group like HGV or passengers, costs etc.	17 gantries on the motorway A 8 and 15 gantries on the motorway A 81 are equipped with LED traffic information displays additional to regular VMS. The single-row displays can be fed with any arbitrary information for the local section and/or the current situation. All road users are thankful for any extra information that helps to cope with upcoming incidents or to understand and accept mandated traffic signs.
Relation with national access point set up according to EC Delegated Regulations	☐ Provide information to the national access point ☐ Receive information from the national access point ☒ No connection to the national access point, not yet
Information provision to end users	☐ Web portal ☐ Phone app ☐ VMS ☐ In-vehicle information ☒ Other: LED information display (single-row bar)

	IMPLEMENTATION ASPECTS
Year of implementation (+ end date of measure if applicable)	2012
Technical description	— single-row LED-display bars — type size 350 mm — max. 43 characters — length 8.200 mm — color white, black background
Lessons learnt / factor of success / topics considered as good practice (technical, legal, organisational, financial)	— specific companies are prepared to deliver these devices, although the system is not widespread — easy to install on still existing gantries (normally no additional static requirements necessary) — maintenance and occurring costs are very low (less than 10.000 euros/year) — no directive on road traffic regulations necessary

Impacts assessment / results (if available)	— LED-displays are not official traffics signs, therefore the displays are not well known all over Germany, but: — given information is understood, accepted and obeyed by the road users — positive feedback

ILLUSTRATIONS

REFERENCES	
Documentation available on the project	No special web site available.
Web link	For general information go to http://www.svz-bw.de/fileadmin/vba/Anlagensteckbrief_SBA_A8_Leonberg_Wendlingen.pdf

1.1.1.4 Traffic situation website

GENERAL INFORMATION	
Name of service/system/project	Traffic situation website
Name of operator/organisation	Finnish Transport Agency
Service delivery	☒ Public ☐ Private
Mainly applicable Deployment Guideline	TIS-DG02 Traveller Information Services FORECAST AND REAL TIME EVENT INFORMATION TIS-DG03-05 Traveller Information Services TRAFFIC CONDITION AND TRAVEL TIME INFORMATION
Other relevant Deployment Guideline(s)	
Contact for more information	Tomi Laine, Strafica Ltd. (tomi.laine@strafica.fi)

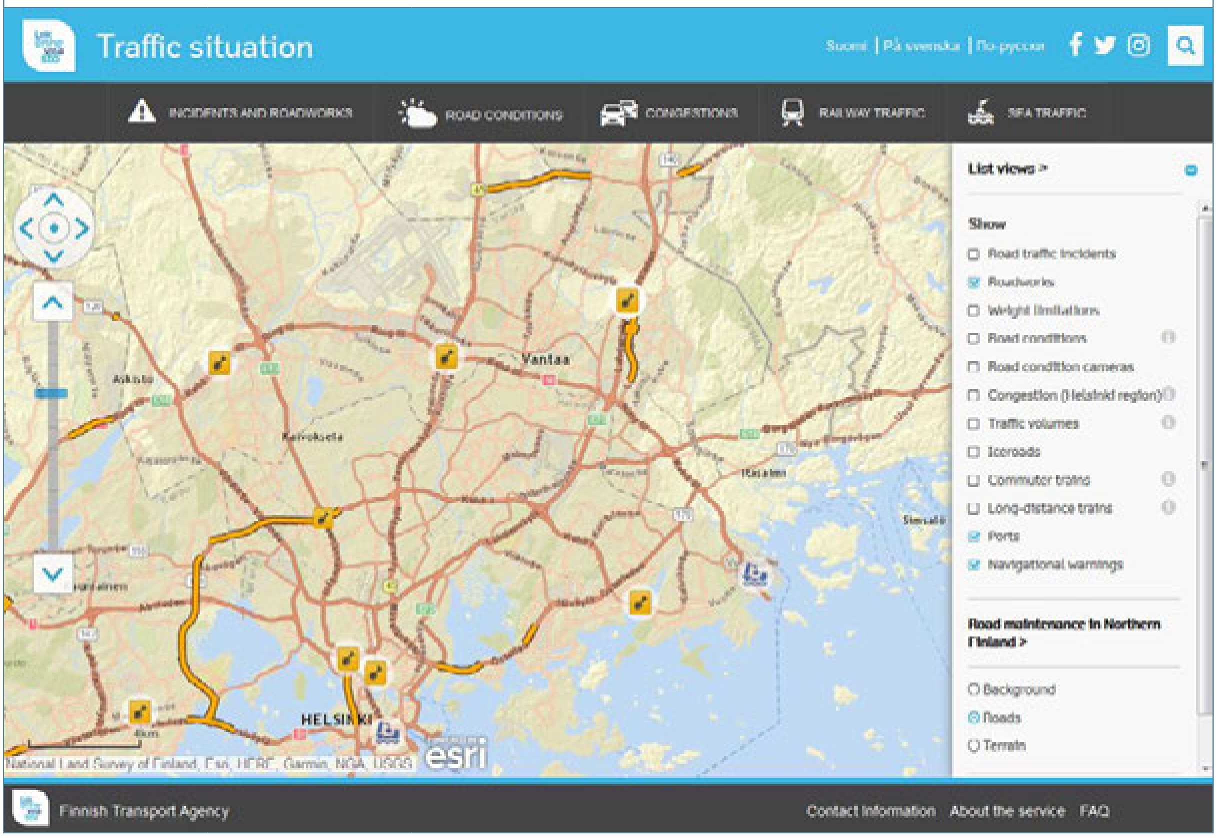
GEOGRAPHICAL ASPECTS	
Country	Finland
Region of implementation	Finland
Corridor(s) or Network(s) concerned	Main road network

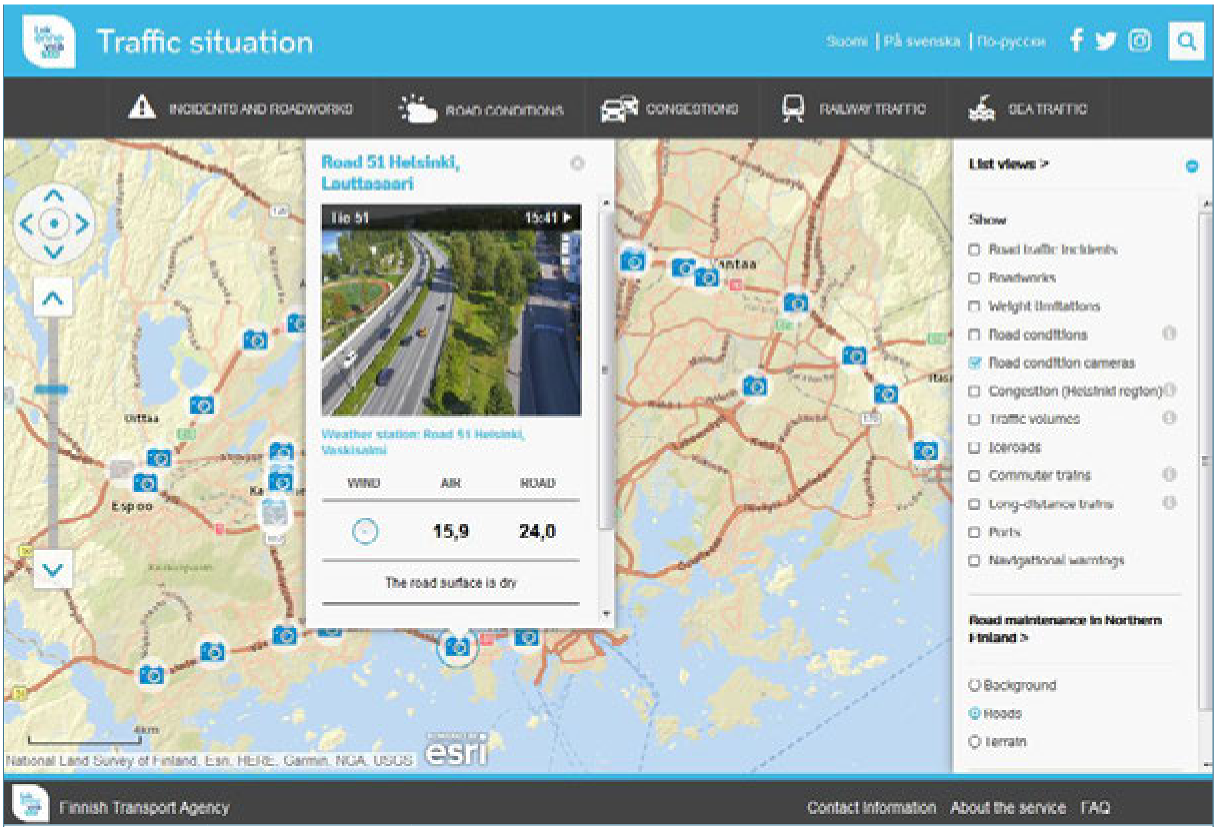
ITS SERVICE DESCRIPTION	
General Objectives	☒ Reduction of congestion ☒ Increase of safety ☐ Reduction of environmental damage ☐ Protection of the road infrastructure ☐ Increase traveller comfort ☒ Other: Increase travellers' situation awareness
Specific Objectives	☐ Change the distribution in time of transport in order to achieve a more even allocation, avoiding peaks (access restrictions, fees) ☐ Change the distribution of transport in space in order to achieve a more even distribution on the network, and prevent "wrong vehicles on wrong places" (traffic control, traffic management, traffic information, access restrictions) ☐ Change the composition of vehicles on a certain piece of infrastructure (access restrictions, fees) ☐ Manage the flow on a given road section in order to reduce speed variation and thus improve the capacity and reduce the risk of incidents ☐ Manage access to a given road section in order to prevent disturbances and reduce the risk of incidents (e.g. ramp metering) ☐ Increase the speed on the link and thus increase capacity (throughput) ☒ Reduce the risk of incidents and traffic disruptions through better informed infrastructure users (traffic and traveller information) ☐ Reduce the consequences from disruptions through fast countermeasures (incident response time) ☐ Reduce traffic volumes through redistributing transport between transport modes ☐ Other
Short narrative description of your best practice including e.g. geographical dimension, numbers, target group like HGV or passengers, costs etc.	One website which shows traffic status (road transport, commuter trains, long-distance trains), incidents, roadworks, road weather condition, warnings, etc. for the whole country
Relation with national access point set up according to EC Delegated Regulations	☒ Provide information to the national access point ☒ Receive information from the national access point ☐ No connection to the national access point
Information provision to end users	☒ Web portal ☐ Phone app ☐ VMS ☐ In-vehicle information ☐ Other

IMPLEMENTATION ASPECTS	
Year of implementation (+ end date of measure if applicable)	2014 (publication of the current version)
Technical description	The new traffic situational service is owned by the Finnish Transport Agency but it's development and upkeeping is outsourced to a private company Karttakeskus, who won the tendering process. In the service all real-time data considering road traffic is presented on the same map, allowing the user to choose the content: incidents, current and predicted road weather, traffic conditions, weight limitations, ice roads and traffic camera pictures. In addition to that, also information on trains and maritime transport are available, to allow the planning of the multimodal trip chains. The design goals were improved zoomable maps, visual and functional clarity, user tailored content and high technical performance. The service is designed so that it can be accessed with mobile devices with high quality user experience. The service uses the gps-location of the mobile device to present the information close to the user, and the user interface scales down to different display sizes automatically.

Lessons learnt / factor of success / topics considered as good practice (technical, legal, organisational, financial)	The service was built using agile software development methods, that reduced the development time considerably. The use of cloud service instead of traditional databases made it easy for Karttakeskus to manage and upkeep the service. This meant cost-efficiency for the Finnish Transport Agency. The service is also easily and flexibly expanded to include new data sources. Because of the chosen technologies, the service is also highly scalable, being able to serve even 1 million daily users during the days of severe winter storms.
Impacts assessment / results (if available)	–

ILLUSTRATIONS




Traffic situation
Suomi | På svenska | По-русски
INCIDENTS AND ROADWORKS
ROAD CONDITIONS
CONGESTIONS
RAILWAY TRAFFIC
SEA TRAFFIC
Road 51 Helsinki, Lauttasaari
Tie 51
15:41
WIND
AIR
ROAD
15,9
24,0
The road surface is dry
List views >
Show
Road traffic incidents
Roadworks
Weight limitations
Road conditions
Road condition cameras
Congestion (Helsinki region)
Traffic volumes
Iceroads
Commuter trains
Long-distance trains
Ports
Navigational warnings
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Roads
Terrain
Espoo
National Land Survey of Finland, Esri, HERE, Garmin, NGA, USGS
esri
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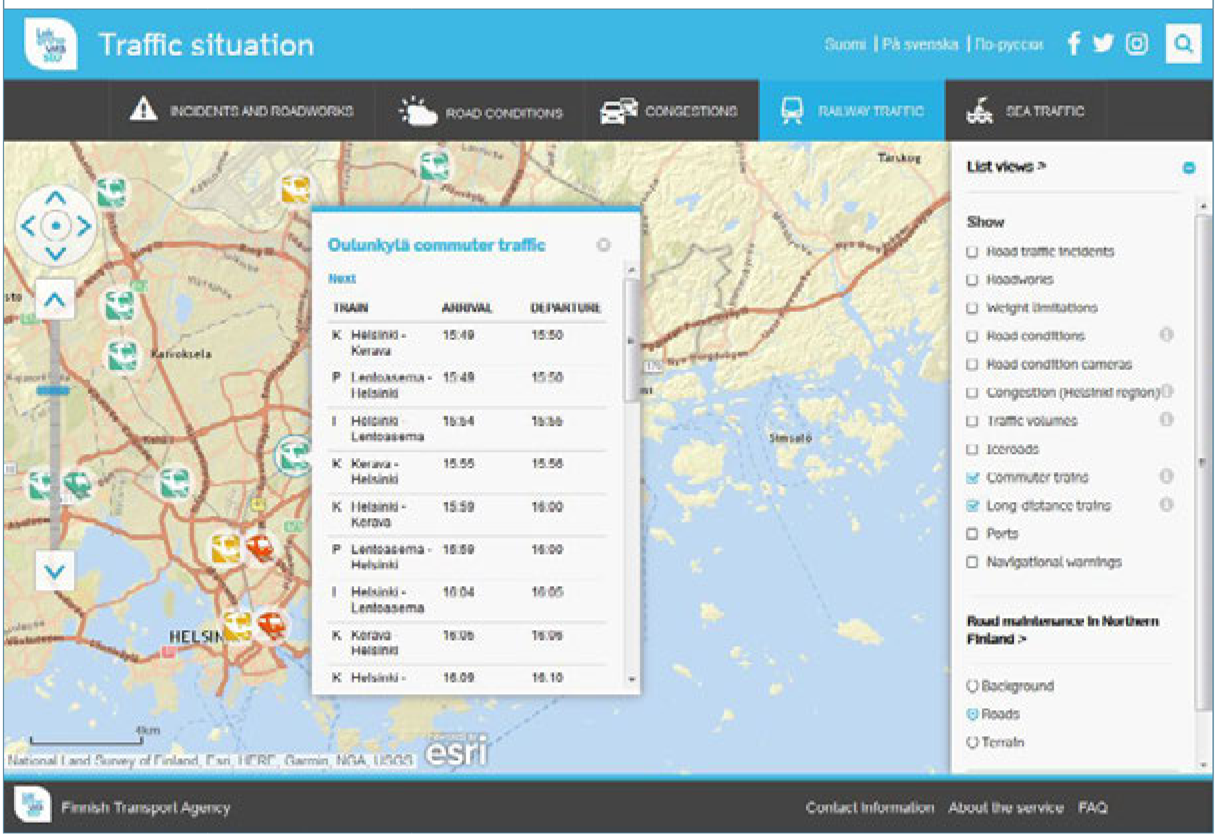
Traffic situation
Suomi | På svenska | По-русски
INCIDENTS AND ROADWORKS
ROAD CONDITIONS
CONGESTIONS
RAILWAY TRAFFIC
SEA TRAFFIC
Oulunkylä commuter traffic
Next
TRAIN
ARRIVAL
DEPARTURE
K Helsinki - Kerava 15:49 15:50
P Lentoasema - Helsinki 15:49 15:50
I Helsinki - Lentoasema 15:54 15:56
K Kerava - Helsinki 15:55 15:56
K Helsinki - Kerava 15:59 16:00
P Lentoasema - Helsinki 15:59 16:00
I Helsinki - Lentoasema 16:04 16:05
K Kerava - Helsinki 16:05 16:06
K Helsinki - 16:09 16:10
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Show
Road traffic incidents
Roadworks
Weight limitations
Road conditions
Road condition cameras
Congestion (Helsinki region)
Traffic volumes
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Long-distance trains
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Road maintenance in Northern Finland >
Background
Roads
Terrain
National Land Survey of Finland, Esri, HERE, Garmin, NGA, USGS
esri
Finnish Transport Agency
Contact information
About the service
FAQ

REFERENCES	
Documentation available on the project	http://www.liikennevirasto.fi/yhteystiedot/liikennetilannepalvelu#.WZ VrsGcUkit (in Finnish)
Web link	http://liikennetilanne.liikennevirasto.fi/

1.1.1.5 Traffic Scotland Information Services

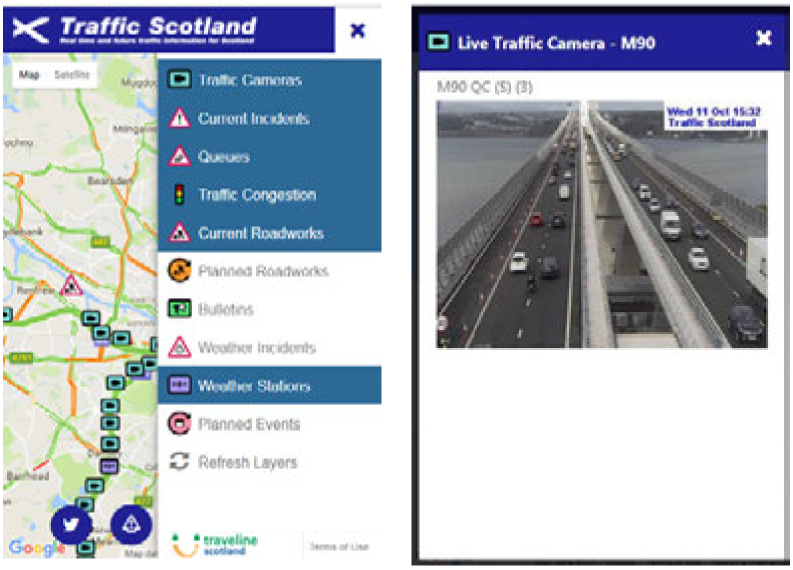
GENERAL INFORMATION	
Name of service/system/project	Traffic Scotland Information Services
Name of operator/organisation	Transport Scotland
Service delivery	Public Private
Mainly applicable Deployment Guideline	Forecast and Real Time Event Information
Other relevant Deployment Guideline(s)	
Contact for more information	Peter McGillion

GEOGRAPHICAL ASPECTS	
Country	Scotland, UK
Region of implementation	Scotland, UK
Corridor(s) or Network(s) concerned	Trunk Road Network including Arc Atlantique Corridor

ITS SERVICE DESCRIPTION	
General Objectives	☒ Reduction of congestion ☒ Increase of safety ☐ Reduction of environmental damage ☐ Protection of the road infrastructure ☒ Increase traveller comfort ☐ Other
Specific Objectives	☐ Change the distribution in time of transport in order to achieve a more even allocation, avoiding peaks (access restrictions, fees) ☐ Change the distribution of transport in space in order to achieve a more even distribution on the network, and prevent "wrong vehicles on wrong places" (traffic control, traffic management, traffic information, access restrictions) ☐ Change the composition of vehicles on a certain piece of infrastructure (access restrictions, fees) ☐ Manage the flow on a given road section in order to reduce speed variation and thus improve the capacity and reduce the risk of incidents ☐ Manage access to a given road section in order to prevent disturbances and reduce the risk of incidents (e.g. ramp metering) ☐ Increase the speed on the link and thus increase capacity (throughput) ☒ Reduce the risk of incidents and traffic disruptions through better informed infrastructure users (traffic and traveller information) ☐ Reduce the consequences from disruptions through fast countermeasures (incident response time) ☐ Reduce traffic volumes through redistributing transport between transport modes ☐ Other
Short narrative description of your best practice including e.g. geographical dimension, numbers, target group like HGV or passengers, costs etc.	The Traffic Scotland Information Service (TSIS) provides real-time and planned, future information about the Scottish road network to the travelling public. VMS installed on the network are used inform road users of forecast and real-time events.
Relation with national access point set up according to EC Delegated Regulations	☒ Provide information to the national access point ☐ Receive information from the national access point ☐ No connection to the national access point

Information provision to end users	☒ Web portal ☐ Phone app ☒ VMS ☐ In-vehicle information ☒ Other: — Mobile site — RSS feeds — DATEX II feed — FTP Service - Traffic Scotland Live Traffic Camera — Twitter feed — Dedicated call centre — National, local and commercial media — Streaming internet radio service

IMPLEMENTATION ASPECTS	
Year of implementation (+ end date of measure if applicable)	Initial implementation in 2002
Technical description	RTTI data provided: — Incidents — Roadworks (live and planned) — Planned events — Event specific travel & traffic information — Live traffic CCTV images — Live VMS messages — Weather stations outputs & weather warnings — Travel times — Traffic queues and congestion VMS are used to manage the trunk road network by providing advanced warning of emergencies and incidents to aid drivers in their journey planning, and warn drivers of future events that may cause delay. A VMS legend document provides the approved VMS messages for local and wide area responses.
Lessons learnt / factor of success / topics considered as good practice (technical, legal, organisational, financial)	Creating a developer area with a collection of web pages explaining what data feeds and services are available and how to access them to reduce the number requests which are currently directed to the feedback email. The developer service includes an API. This API allows developers to embed Traffic Scotland data and functionality into their own applications and websites. Central CMS to control the various aspects of the Traffic Scotland web information system, provides a single, easy to use system to enter and update information. This streamlines processes, saves operator time, and reduces training time. Most modern web based RTTI services are map driven. Users expect interactive functions, mapping functions similar to Microsoft and Google (smooth panning, aerial photography etc.), this was the focus of the new mobile service. The use of social media for alerts has also proved a valuable addition to the service. In the past few years, the emphasis has been on allowing websites to communicate and share information. Social networking has become a day-to-day activity for millions of users commenting, tagging, rating and sharing content. The latest news items are just as likely to be reported first on social networks as they are on the news. Opportunities exist to promote Traffic Scotland content and expose the service to a wider audience using social media. Colocation of information providers, for example Twitter and traffic radio services are present in the control centre, this helps information exchange and consistent messaging. User specified content with the integration of services with social media, alerts, location based services, Traffic Scotland Radio; the aim is to proactively deliver real-time information to users when, where and how they want it. Regular review and updating of authorised VMS legends to ensure network changes are reflected and new VMS signing situations are anticipated.
Impacts assessment / results (if available)	

ILLUSTRATIONS

Traffic Scotland Mobile menu (left) and CCTV images(right)

REFERENCES	
Documentation available on the project	
Web link	Mobile - https://my.trafficscotland.org/ Desktop - https://trafficscotland.org/

1.1.1.6 Use of Floating Car Data for speed and travel time

GENERAL INFORMATION	
Name of service/system/project	Use of Floating Car Data for speed and travel time
Name of operator/organisation	National Data Warehouse for Traffic Information
Service delivery	☒ Public ☐ Private
Mainly applicable Deployment Guideline	TIS DG02 - Forecast and Real Time Event Information
Other relevant Deployment Guideline(s)	TIS DG03 - Traffic Condition and Travel Time Information Service
Contact for more information	info@ndw.nu

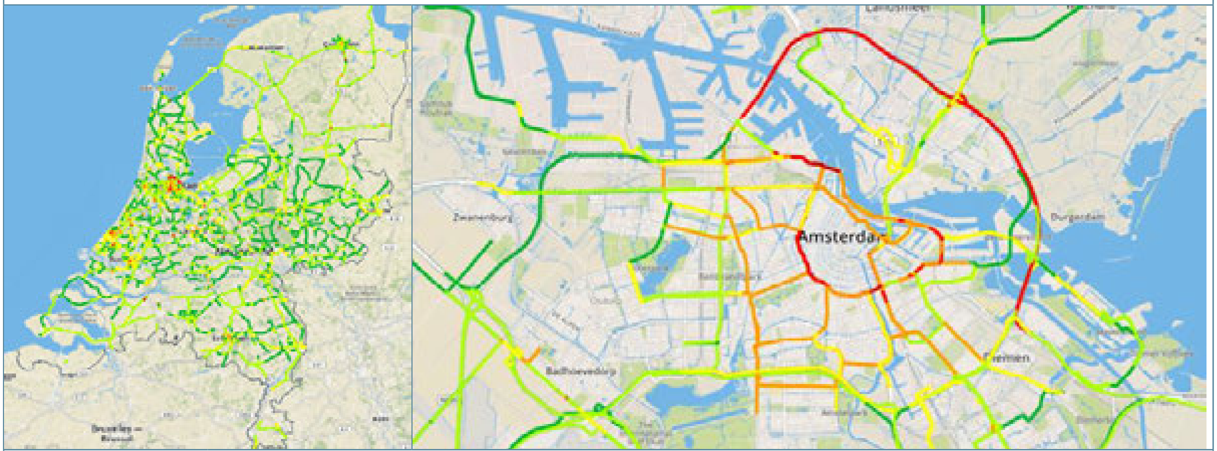
GEOGRAPHICAL ASPECTS	
Country	The Netherlands
Region of implementation	Nationwide
Corridor(s) or Network(s) concerned	All highways, provincial roads and main city roads

ITS SERVICE DESCRIPTION	
General Objectives	☒ Reduction of congestion ☐ Increase of safety ☐ Reduction of environmental damage ☐ Protection of the road infrastructure ☐ Increase traveller comfort ☒ Other: Improvement of traffic information coverage and historical analysis

Specific Objectives	☐ Change the distribution in time of transport in order to achieve a more even allocation, avoiding peaks (access restrictions, fees) ☐ Change the distribution of transport in space in order to achieve a more even distribution on the network, and prevent "wrong vehicles on wrong places" (traffic control, traffic management, traffic information, access restrictions) ☐ Change the composition of vehicles on a certain piece of infrastructure (access restrictions, fees) ☒ Manage the flow on a given road section in order to reduce speed variation and thus improve the capacity and reduce the risk of incidents ☐ Manage access to a given road section in order to prevent disturbances and reduce the risk of incidents (e.g. ramp metering) ☐ Increase the speed on the link and thus increase capacity (throughput) ☒ Reduce the risk of incidents and traffic disruptions through better informed infrastructure users (traffic and traveller information) ☒ Reduce the consequences from disruptions through fast countermeasures (incident response time) ☐ Reduce traffic volumes through redistributing transport between transport modes ☐ Other
Short narrative description of your best practice including e.g. geographical dimension, numbers, target group like HGV or passengers, costs etc.	Procurement of real-time speed information on segments on the entire road network in the Netherlands. Every minute, the average speed on 9 million segments (of a maximum length of 50 metres) is delivered to NDW. With these segment speeds, NDW calculates a travel time on selected routes chosen by road authorities. The average speeds are detected and calculated by Be-Mobile using a user base of approx. 1,2 mln devices. This is done using GPS-traces from mobile phone applications and fleet management systems. This travel time data is used in 1) traffic management centres to monitor the traffic situation, 2) to show travel times on VMS, replacing currently used roadside equipment to detect travel times, like ANPR-cameras or Bluetooth systems and 3) is stored in an historical database for traffic policy analysis purposes. The segment speeds are available for use by road authorities only. The derived travel times are distributed as open data through opendata.ndw.nu .
Relation with national access point set up according to EC Delegated Regulations	☒ Provide information to the national access point ☐ Receive information from the national access point ☐ No connection to the national access point
Information provision to end users	☒ Web portal ☐ Phone app ☒ VMS ☐ In-vehicle information ☐ Other

IMPLEMENTATION ASPECTS	
Year of implementation (+ end date of measure if applicable)	Implemented February 2017, contract extension confirmed until November 2018
Technical description	Real-time delivery of average speeds on 9 mln road segments of max. 50 metres length, every minute. Segments are plotted on Open Streetmap, the data can be plotted using OpenLocationReferencing.
Lessons learnt / factor of success / topics considered as good practice (technical, legal, organisational, financial)	1. Very positive cost/benefits: increased coverage of traffic information for a fraction of the costs of roadside equipment 2. Avoid implementation of custom segmentation as this is a large cost driver on the data supplier side: use their proprietary segmentation 3. Develop quality criteria for use during procurement, to determine data quality of sample sets as objectively as possible 4. Determine possibilities of (semi-)open licensing with supplier, to stimulate use and implementation of data (for a limited time) 5. It is not (yet) possible to derive vehicle counts or vehicle categories using FCD.
Impacts assessment / results (if available)	▪ Information coverage increase from 8.200km (with roadside equipment) to potentially 50.000+ km using FCD. ▪ Very high cost/benefit results when replacing ANPR-cameras with FCD for use for travel times on VMS. ▪ Speed and travel time data quality is good when comparing with other roadside technologies.

ILLUSTRATIONS



examples of travel time routes as derived from FCD speed data

REFERENCES	
Documentation available on the project	
Web link	www.ndw.nu

1.1.1.7 Application VINCI Autoroutes for smartphones

GENERAL INFORMATION	
Name of service/system/project	Application VINCI Autoroutes for smartphones
Name of operator/organisation	VINCI Autoroutes
Service delivery	☒ Public ☐ Private
Mainly applicable Deployment Guideline	TIS-DG02 Forecast and Real Time Event Information
Other relevant Deployment Guideline(s)	
Contact for more information	Laurent BESSOU VINCI Autoroutes / ASF, France +33 6 67 21 42 81, laurent.bessou@vinci-autoroutes.com

GEOGRAPHICAL ASPECTS	
Country	France
Region of implementation	French Southern motorways network
Corridor(s) or Network(s) concerned	Medtis and Arc Atlantique

ITS SERVICE DESCRIPTION	
General Objectives	☒ Reduction of congestion ☒ Increase of safety ☐ Reduction of environmental damage ☐ Protection of the road infrastructure ☒ Increase traveller comfort ☐ Other: ______________________

Specific Objectives	☒ Change the distribution in time of transport in order to achieve a more even allocation, avoiding peaks (access restrictions, fees) ☐ Change the distribution of transport in space in order to achieve a more even distribution on the network, and prevent "wrong vehicles on wrong places" (traffic control, traffic management, traffic information, access restrictions) ☐ Change the composition of vehicles on a certain piece of infrastructure (access restrictions, fees) ☐ Manage the flow on a given road section in order to reduce speed variation and thus improve the capacity and reduce the risk of incidents ☐ Manage access to a given road section in order to prevent disturbances and reduce the risk of incidents (e.g. ramp metering) ☐ Increase the speed on the link and thus increase capacity (throughput) ☒ Reduce the risk of incidents and traffic disruptions through better informed infrastructure users (traffic and traveller information) ☐ Reduce the consequences from disruptions through fast countermeasures (incident response time) ☐ Reduce traffic volumes through redistributing transport between transport modes ☒ Other
Short narrative description of your best practice including e.g. geographical dimension, numbers, target group like HGV or passengers, costs etc.	In line with its customer charter, ASF (French southern motorways operator) for the count of VINCI Autoroutes (First European motorways operator) has decided to investigate the opportunities brought by the new media context, (smartphones, collaborative and community applications). This vision can be executed around 2 main points : ▪ Establishing a one-to-one relationship with the end-user, by broadcasting value-added information, more accurate, more reliable, personalized and location-based ; ▪ Making possible that the end-user participates in the information value chain, by collecting his feedback on broadcasted traffic information. It appears very interesting to take advantage on using the nowaday's most popular and spreaded device: the smartphone. All in the genome of a smartphone seems to be implemented to fit with what VINCI Autoroutes wants to design: Geolocation functions, feedback capabilities, smart control interface. It appears very clear that the smartphone will become the most powerful end of the motorway's ITS chain. Directly linked to Traffic Management Centers and so to all motorway's ITS, the app has been developed around distinct universes: ▪ A map presenting traffic and motorway information, ▪ An on-board "virtual" VMS (Variable Message Sign) ▪ An on-board emergency call service. ▪ A Traffic Alerts system focused on user's declared travels
Relation with national access point set up according to EC Delegated Regulations	☐ Provide information to the national access point ☐ Receive information from the national access point ☒No connection to the national access point
Information provision to end users	☐ Web portal ☒Phone app ☐ VMS ☐ In-vehicle information ☐ Other

IMPLEMENTATION ASPECTS	
Year of implementation (+ end date of measure if applicable)	2012
Technical description	*Traffic and information maps,* Dedicated to pre-trip use, a map delivers traffic information as well as road works, travel times, traffic incidents (congestions, accidents …) on "VINCI Autoroutes" Motorways. These information are based on the real time traffic knowledge of the road operator concerning its network. Maps also generate POI for exit ramps, rest areas and a description of all the services provided. Customer Feedback can be sent mainly to give notations on rest areas services. *The On-board Virtual VMS concept* Based on the GPS location of the smartphone, the traffic and signalisation information can also be presented in another way: virtual VMS are shown along the trip of our customers directly dedicated to each of them. The person who's not driving can easily "live" interact with the motorway operator by signalling the truth of an information displayed. Moreover, a new incident can be signalled. The Traffic Management Center is equipped with a feedback message management system to quickly take into account the customers' feedbacks. *The On-Board Emergency call system* Finally, knowing exactly customers' position on the network, a third innovation is offered to the users: in case of emergency, car break for example, a simple click on the emergency call button establishes a connection with the operator, exactly as if the customer had walked along the motorway to reach the next emergency phone. The call and position of the customer are presented to the operator directly on his emergency management tool. Delays of reaction can then be highly reduced and safety highly increased (no need to walk along the motorway). *Traffic Alerts* Once configurated, VINCI Autoroutes warns you directly with customized traffic alerts corresponding to a travel on a motorway considering a time and a section.
Lessons learnt / factor of success / topics considered as good practice (technical, legal, organisational, financial)	Customers can easily download "Application VINCI Autoroutes" for free on dedicated stores (AppStore and Android Market). That's already done for more of 700 000 of them, making this application an incontestable success (300 000 frequent users)
Impacts assessment / results (if available)	Coming from the motorway operators' ITS, traffic and security informations have now found a new direct way to reach their audience, with accuracy, in a customized and smart way.

ILLUSTRATIONS

Figure 1 – screenshot of the dashboard orienting to the different services

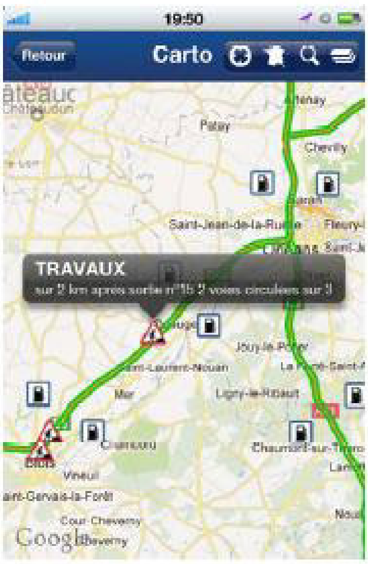


Figure 2 – screenshot of the map presenting a roadworks and normal conditions on the motorway (green color)

Figure 3 – Screenshot of the virtual VMS board presenting roadworks at 10km after an exit and a rest area closure

Figure 4 – Screenshot of the virtual VMS board presenting a traffic jam at 22 km

Figure 5 – Screenshot of the on-board Emergency call service

Figure 6 – screenshot of the traffic alert configuration

REFERENCES	
Documentation available on the project	
Web link	

1.1.1.8 Dutch Real-Time Traffic Event information at www.RWSverkeersinfo.nl (Website & Twitter)

GENERAL INFORMATION	
Name of service/system/project	Dutch Real-time Traffic Event information at www.RWSverkeersinfo.nl (Website & Twitter)
Name of operator/organisation	Rijkswaterstaat
Service delivery	☒ Public ☐ Private
Mainly applicable Deployment Guideline	TIS-DG02 - Forecast and Real Time Event Information
Other relevant Deployment Guideline(s)	
Contact for more information	Cindy Geusebroek

GEOGRAPHICAL ASPECTS	
Country	Netherlands
Region of implementation	National Road Network
Corridor(s) or Network(s) concerned	National Road Network

ITS SERVICE DESCRIPTION	
General Objectives	☒ Reduction of congestion ☒ Increase of safety ☐ Reduction of environmental damage ☐ Protection of the road infrastructure ☒ Increase traveller comfort ☐ Other: Please specify.
Specific Objectives	☐ Change the distribution in time of transport in order to achieve a more even allocation, avoiding peaks (access restrictions, fees) ☐ Change the distribution of transport in space in order to achieve a more even distribution on the network, and prevent "wrong vehicles on wrong places" (traffic control, traffic management, traffic information, access restrictions) ☐ Change the composition of vehicles on a certain piece of infrastructure (access restrictions, fees) ☐ Manage the flow on a given road section in order to reduce speed variation and thus improve the capacity and reduce the risk of incidents ☐ Manage access to a given road section in order to prevent disturbances and reduce the risk of incidents (e.g. ramp metering) ☐ Increase the speed on the link and thus increase capacity (throughput) ☒ Reduce the risk of incidents and traffic disruptions through better informed infrastructure users (traffic and traveller information) ☐ Reduce the consequences from disruptions through fast countermeasures (incident response time) ☐ Reduce traffic volumes through redistributing transport between transport modes ☐ Other: Please specify.
Short narrative description of your best practice including e.g. geographical dimension, numbers, target group like HGV or passengers, costs etc.	With 24/7 real-time, complete and trustworthy pre-trip traffic information, Rijkswaterstaat (RWS) informs road users to keep them safe and to inform them about the status and forecast of traffic flow. The website shows the location of traffic jams, incidents, road works, lane/road closures, bridge openings and live stream traffic cameras. User support functionalities: 1. expected traffic congestions during rush hour, 2. route planner showing traffic alerts, 3. daily traffic news. On one hand RWS spreads data to our National Road Traffic Data Portal – (https://english.ndw.nu/) where service providers (navigation, radio etc.) can use this data. Since 2018 RWS also spreads traffic information through their own communication channels: www.rwsverkeersinfo.nl (Traffic Information website). This works in an eco-system with our Twitter account. In case we have to deal with particular road situations or big incidents which have great impact on the flow and safety, we spread the news on Twitter and our website. Especially journalists and (national) media use our website and twitter to forward our information to their followers and visitors. This way we affect the behaviour of road users; 'I will leave home later to work to avoid nuisance'. With the awareness we create by using Twitter, we pull followers to our website (eco system). We answer questions as well and react with our webcare. This is important in order to be a trusted partner for road users and media so they come back to us to get well informed. On our website we show information plus details. This contributes to our proposition to be knowledge leader in traffic. Because we are the source of this knowledge we distinguish ourselves from other traffic information platform and complement them with our extra information. Important: our tone of voice is approachable, accessible and open. This tone of voice is a big part of our success.
Relation with national access point set up according to EC Delegated Regulations	☐ Provide information to the national access point ☒ Receive information from the national access point ☐No connection to the national access point
Information provision to end users	☒ Web portal ☐Phone app ☐ VMS ☐ In-vehicle information ☒ Other: Twitter

IMPLEMENTATION ASPECTS	
Year of implementation (+ end date of measure if applicable)	Implemented in 2018, updated in 2020
Technical description	Data from the NAP (NDW) and other data sources like ONDA Backend website CMS for the media team to create content for the website More content on site; Widget 'Nuisance on route' (in Dutch; 'Hinder op je route') Readable traffic information (from data to readable info) Roadworks Forecast Traffic News (media team uses CMS) Traffic cameras (real-time streaming) Map that includes nuisance like incidents, road closures Podcast and Video Twitter account Coosto platform to publish, monitor, react on Twitter
Lessons learnt / factor of success / topics considered as good practice (technical, legal, organisational, financial)	Especially with a forecast like extreme weather or other special information with a lot of impact on traffic, we see more website visitors. Media and road users have more need for information. For example when we start a blog on our site, that we promote on twitter, we see more website visitors. We continue development on the site to be more user-friendly. We continue development on Twitter to keep up with new algorithms and social strategy.
Impacts assessment / results (if available)	We have ~500.000 visitors each month on the website. We have 110.000 Twitters followers. (At time of filling this form)

ILLUSTRATIONS	
Twitter	
Webcare - anserwing questions	

Spin off in Media	
Website	

REFERENCES	
Documentation available on the project	–
Web link	www.rwsverkeersinfo.nl https://twitter.com/RWSverkeersinfo

1.1.2 TTIS-02 Traffic Condition and Travel Time Information

1.1.2.1 Bison Futé services

GENERAL INFORMATION	
Name of service/system/project	Bison Futé service
Name of operator/organisation	French Ministry in charge of transports
Service delivery	☒ Public ☐ Private
Mainly applicable Deployment Guideline	TIS-DG03 Traffic Condition and Travel Time Information Service
Other relevant Deployment Guideline(s)	TIS DG02 Forecast and Real Time Event Information
Contact for more information	dominique.lerouvillois@developpement-durable.gouv.fr

GEOGRAPHICAL ASPECTS	
Country	France
Region of implementation	France
Corridor(s) or Network(s) concerned	National French network

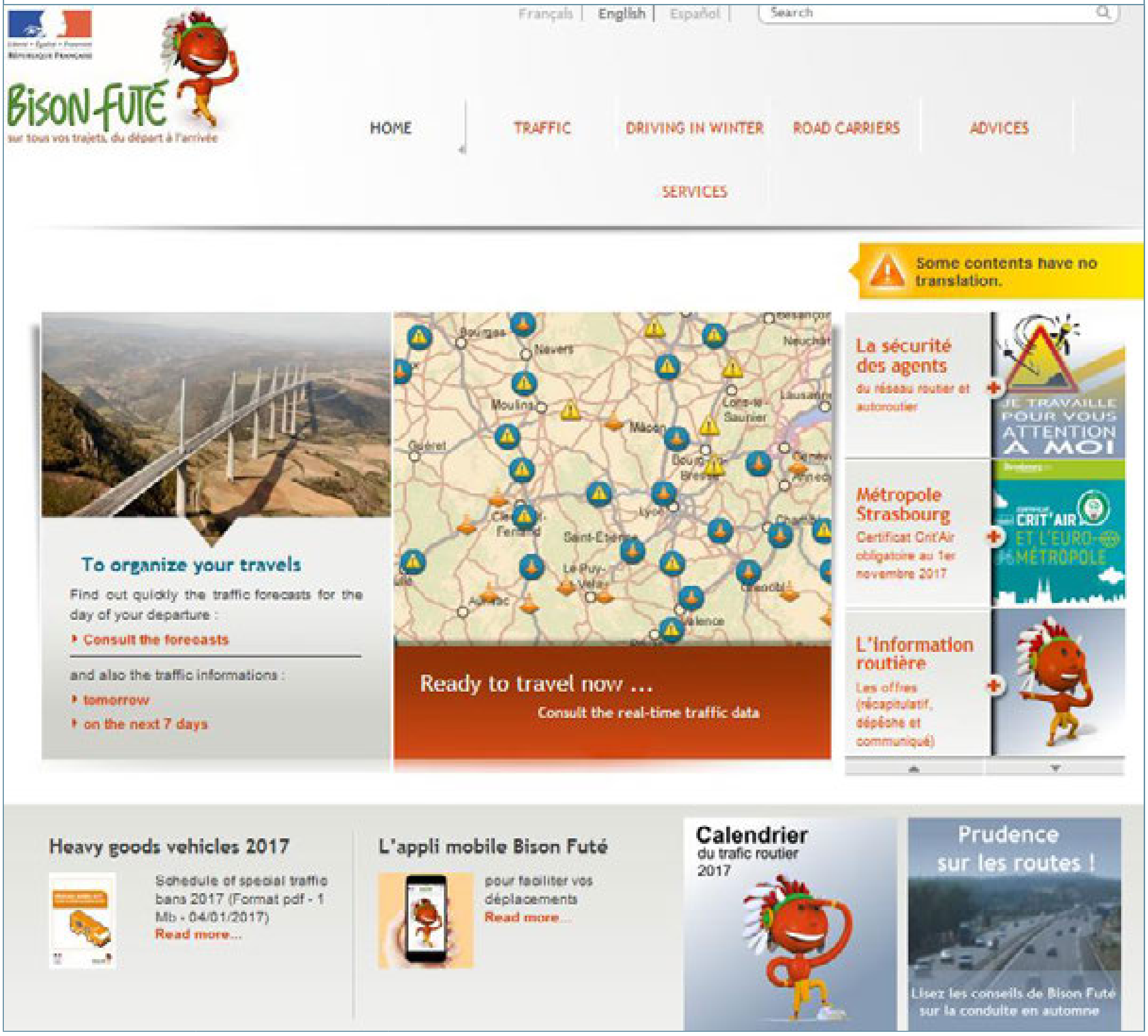
ITS SERVICE DESCRIPTION	
General Objectives	☒ Reduction of congestion ☒ Increase of safety ☒ Reduction of environmental damage ☒ Protection of the road infrastructure ☒ Increase traveller comfort ☐ Other
Specific Objectives	☒ Change the distribution in time of transport in order to achieve a more even allocation, avoiding peaks (access restrictions, fees) ☒ Change the distribution of transport in space in order to achieve a more even distribution on the network, and prevent “wrong vehicles on wrong places” (traffic control, traffic management, traffic information, access restrictions) ☐ Change the composition of vehicles on a certain piece of infrastructure (access restrictions, fees) ☐ Manage the flow on a given road section in order to reduce speed variation and thus improve the capacity and reduce the risk of incidents ☐ Manage access to a given road section in order to prevent disturbances and reduce the risk of incidents (e.g. ramp metering) ☐ Increase the speed on the link and thus increase capacity (throughput) ☒ Reduce the risk of incidents and traffic disruptions through better informed infrastructure users (traffic and traveller information) ☐ Reduce the consequences from disruptions through fast countermeasures (incident response time) ☐ Reduce traffic volumes through redistributing transport between transport modes ☐ Other

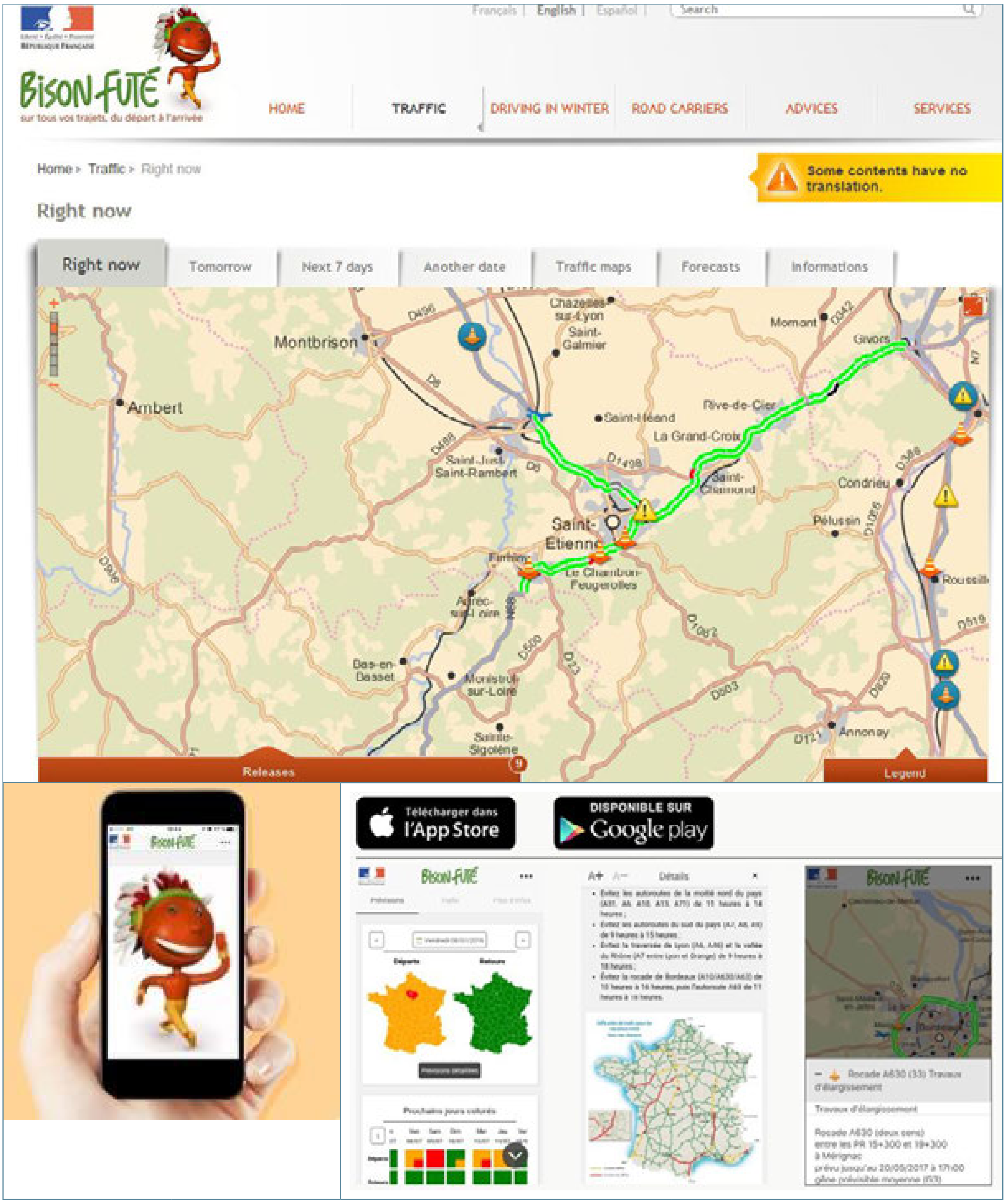
Short narrative description of your best practice including e.g. geographical dimension, numbers, target group like HGV or passengers, costs etc.	The key objective is to provide as many road users as possible with information in real-time. The website Bison Futé presents road information (texts and maps) intended to be directly red by public and professional users. This service proposes a great range of offers: ▪ Traffic (real time and forecast) ▪ Annual forecast calendar ▪ Winter road conditions ▪ Road carriers rules in France ▪ Schedule of special traffic bans ▪ Advices (safety, driving in tunnel, in Europe, sustainable developement..) ▪ Subscription to text or numeric data which corresponds to the national access point set up in France according to EC Delegated Regulations Dynamic data and documents are updated in the Bison Futé site in real time, they are available in digital form to be reused by other sites or any service operators offering road information services. A smart phone application completes the Bison-Futé products. This application, without any commercial advertising, is available for free download for iOS and Android smartphones. This application provides: ▪ traffic forecasts in the form of colored days: green, orange, red or black; ▪ the detailed forecasts specifying the most circulated network as well as advices for driving; ▪ a map of the road events (incident, breakdown, accident, stopper, worksite, etc.) with their location, description, impact on the traffic and, where possible, the expected duration of the disturbances; ▪ traffic status in main cities; ▪ winter road conditions.
Relation with national access point set up according to EC Delegated Regulations	☒ Provide information to the national access point ☐ Receive information from the national access point ☐ No connection to the national access point
Information provision to end users	☒ Web portal ☒ Phone app ☐ VMS ☐ In-vehicle information ☒ Other: this service corresponds to the French national access point set up according to EC Delegated Regulations

IMPLEMENTATION ASPECTS	
Year of implementation (+ end date of measure if applicable)	The public road information service Bison Futé has been modernized in 2013 to become more efficient and better meet users' expectations. A reform has been carried out by the DGITM (Direction Générale des Infrastructures, des Transports et de la Mer) to transform the services and tools organization of the public road information service. The road information provided mainly relates to the national road network (highways and national roads) The smartphone application Bison Futé was developed in 2016

Technical description	The DGITM has developed a new version of the application, Tipi (computer processing for the production of road information), allowing to dematerialize in real time the information chain (from the various systems of the traffic managers in charge of the roads to the Bison-Futé web-site). Now, thanks to Tipi, the Bison-Futé website is directly powered by the real time information provided by the road network managers (regional Fench ministry of transports TCC and private motorway TCC). The real-time information data is updated every 3 minutes The developments have been conducted with the objectives to focus on public service missions and to open access to numeric road data in accordance with national and European policies regarding the digital society. The new version of the site Bison-Futé allows the display of traffic conditions in real time (state of traffic jams) around major cities in France and the display of winter road conditions on the national road network. The mobile version has been enriched, with the addition of traffic forecasts on colored days ("Weekend Colored" tab) and maps of traffic situation and winter road conditions. Different sources provide the Tipi system with road events information. From all this information, Tipi produces a common and consolidated vision (verification, reformulation, qualification) of the situation throughout the territory. Tipi enables subscribers to receive real-time traffic information and event information in DATEX1 and DATEX2. Several criteria are taken into account in order to offer subscribers adapted information products corresponding to their needs: ▪ real time, forecast; ▪ nature of events: accidents and incidents, traffic jams, work, road conditions; ▪ geographical area: departmental, regional, national; ▪ road network: national impact of the event (importance): national, regional, local.
Lessons learnt / factor of success / topics considered as good practice (technical, legal, organisational, financial)	The national road traffic information data base in France is now automatically powered in real time by traffic managers without any manual intervention. This automation of the Bison-Futé service makes it possible to automatically deliver, with an update frequency of 3 minutes, the traffic and event information on the French national network. Thanks to this improvement, the national access point is now operational and provide the service operators with the real time numeric data (traffic and events) in DATEX II format.
Impacts assessment / results (if available)	

ILLUSTRATIONS





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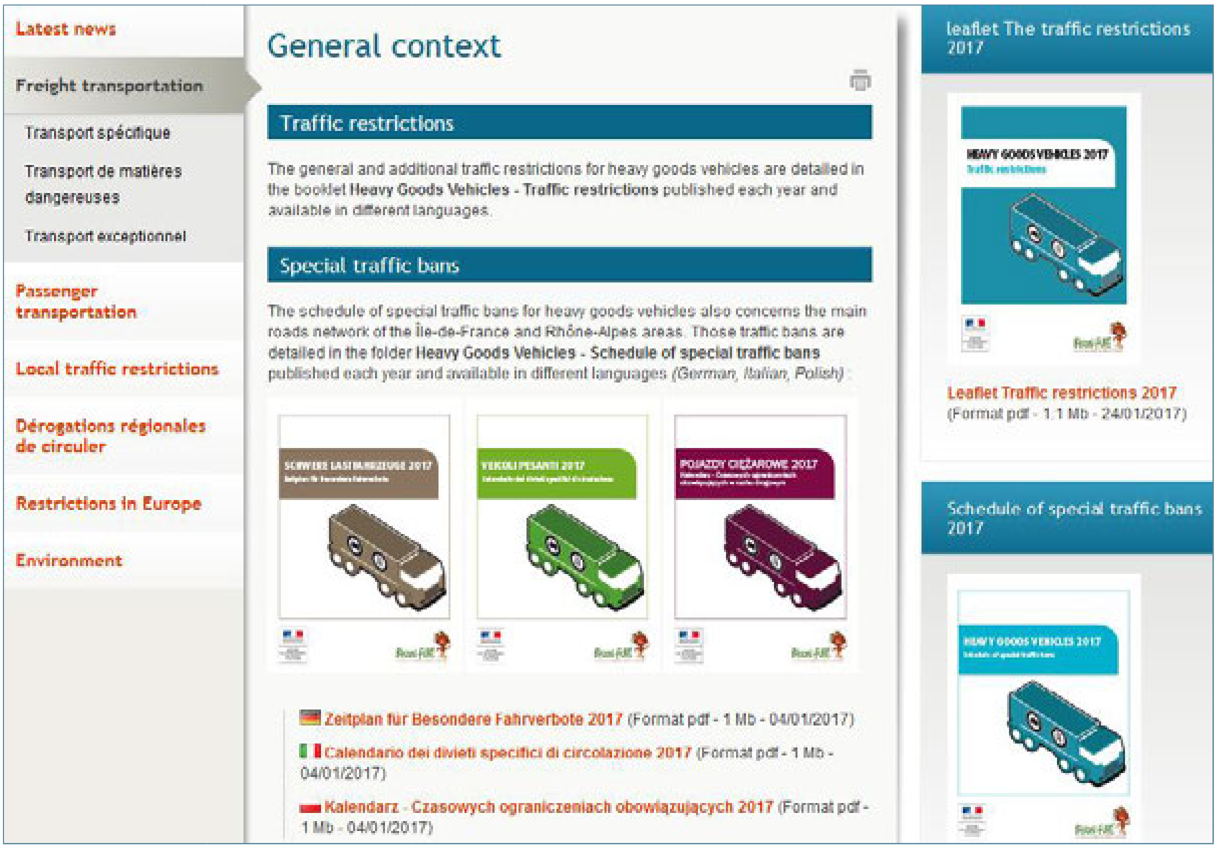
ROAD CARRIERS
ADVICES
SERVICES
Home > Traffic > Right now
Some contents have no translation.
Right now
Right now
Tomorrow
Next 7 days
Another date
Traffic maps
Forecasts
Informations
Montbrison
Ambert
Saint-Etienne
Rive-de-Gier
La Grand-Croix
Givors
Condrieu
Pélussin
Annonay
Releases
Legend
Télécharger dans l'App Store
DISPONIBLE SUR Google play



REFERENCES	
Documentation available on the project	
Web link	http://www.bison-fute.gouv.fr

1.1.2.2 Cross-border Travel Time Continuity between Italy, France and Spain

GENERAL INFORMATION	
Name of service/system/project	CROSS-BORDER TRAVEL TIME CONTINUITY BETWEEN ITALY, FRANCE AND SPAIN
Name of operator/organisation	Four road operators, ASF (FR), ACESA (ES), ESCOTA (FR) and Autostrade dei Fiori (IT),
Service delivery	☒ Public ☐ Private
Mainly applicable Deployment Guideline	TIS-DG03
Other relevant Deployment Guideline(s)	TIS-DG02 TIS-DG05 TIS-DG07
Contact for more information	Frédéric AMBLETON ASF (French private road operator) frederic.ambleton@vinci-autoroutes.com Beatrice THOUVENIN ESCOTA (French private road operator) beatrice.thouvenin@vinci-autoroutes.com

GEOGRAPHICAL ASPECTS	
Country	France, Spain, Italy
Region of implementation	France/Spain border: junction between A9 (FR) and AP-7 (IT) motorways France/Italy border: junction between A8 (FR) and A10 (IT) motorways
Corridor(s) or Network(s) concerned	MedTIS Corridor

ITS SERVICE DESCRIPTION	
General Objectives	☐ Reduction of congestion ☐ Increase of safety ☐ Reduction of environmental damage ☐ Protection of the road infrastructure ☒ Increase traveller comfort ☐ Other
Specific Objectives	☐ Change the distribution in time of transport in order to achieve a more even allocation, avoiding peaks (access restrictions, fees) ☒ Change the distribution of transport in space in order to achieve a more even distribution on the network, and prevent "wrong vehicles on wrong places" (traffic control, traffic management, traffic information, access restrictions) ☐ Change the composition of vehicles on a certain piece of infrastructure (access restrictions, fees) ☐ Manage the flow on a given road section in order to reduce speed variation and thus improve the capacity and reduce the risk of incidents ☐ Manage access to a given road section in order to prevent disturbances and reduce the risk of incidents (e.g. ramp metering) ☐ Increase the speed on the link and thus increase capacity (throughput) ☒ Reduce the risk of incidents and traffic disruptions through better informed infrastructure users (traffic and traveller information) ☐ Reduce the consequences from disruptions through fast countermeasures (incident response time) ☐ Reduce traffic volumes through redistributing transport between transport modes ☒ Other: improve user route planning before and during the trip
Short narrative description of your best practice including e.g. geographical dimension, numbers, target group like HGV or passengers, costs etc.	In the European Schengen Space, the absence of physical frontiers allows drivers to seamlessly travel between two major cities in different countries. Therefore, when talking about road travel information, the notion of frontier is outdated. It appears efficient and useful to disseminate travel time information between nodes of the infrastructure, i.e. major cities on each side of the border. Travel time information is particularly useful on the concerned cross-border section: average traffic volumes as well as peak traffic volumes are relatively high (61 000 veh/day on average for the France/Italy frontier, 150 000 veh/day on peak traffic). Likewise, mountainous landscape on both areas implies potentially dangerous road geometry (high slopes, numerous tunnels), and few alternative roads. Besides, road operators previously established cross-border cooperations: ▪ On the France/Spain border, information shard on the cross-border traffic management system supports a clear understanding of the other network ▪ On the France/Italy border, a direct hotline between Traffic Control Centers is always on the run and used frequently ▪ Real Time Video are exchanged between operators ▪ Cross-border contingency plans are implemented in case of incidents and for winter or fire operations Road operators have their individual time travel information services; this project aims at combining their efforts to offer a seamless service and complete the cross-border service panel.
Relation with national access point set up according to EC Delegated Regulations	☒ Provide information to the national access point ☒ Receive information from the national access point ☐ No connection to the national access point
Information provision to end users	☒ Web portal ☒ Phone app ☒ VMS ☐ In-vehicle information ☐ Other

IMPLEMENTATION ASPECTS	
Year of implementation (+ end date of measure if applicable)	The public road information service Bison Futé has been modernized in 2013 to become more efficient and better meet users' expectations. A reform has been carried out by the DGITM (Direction Générale des Infrastructures, des Transports et de la Mer) to transform the services and tools organization of the public road information service. The road information provided mainly relates to the national road network (highways and national roads) The smartphone application Bison Futé was developed in 2016
Technical description	The DGITM has developed a new version of the application, Tipi (computer processing for the production of road information), allowing to dematerialize in real time the information chain (from the various systems of the traffic managers in charge of the roads to the Bison-Futé web-site). Now, thanks to Tipi, the Bison-Futé website is directly powered by the real time information provided by the road network managers (regional Fench ministry of transports TCC and private motorway TCC). The real-time information data is updated every 3 minutes The developments have been conducted with the objectives to focus on public service missions and to open access to numeric road data in accordance with national and European policies regarding the digital society. The new version of the site Bison-Futé allows the display of traffic conditions in real time (state of traffic jams) around major cities in France and the display of winter road conditions on the national road network. The mobile version has been enriched, with the addition of traffic forecasts on colored days ("Weekend Colored" tab) and maps of traffic situation and winter road conditions. Different sources provide the Tipi system with road events information. From all this information, Tipi produces a common and consolidated vision (verification, reformulation, qualification) of the situation throughout the territory. Tipi enables subscribers to receive real-time traffic information and event information in DATEX1 and DATEX2. Several criteria are taken into account in order to offer subscribers adapted information products corresponding to their needs: ▪ real time, forecast; ▪ nature of events: accidents and incidents, traffic jams, work, road conditions; ▪ geographical area: departmental, regional, national; ▪ road network: national impact of the event (importance): national, regional, local.
Lessons learnt / factor of success / topics considered as good practice (technical, legal, organisational, financial)	The national road traffic information data base in France is now automatically powered in real time by traffic managers without any manual intervention. This automation of the Bison-Futé service makes it possible to automatically deliver, with an update frequency of 3 minutes, the traffic and event information on the French national network. Thanks to this improvement, the national access point is now operational and provide the service operators with the real time numeric data (traffic and events) in DATEX II format.
Impacts assessment / results (if available)	

ILLUSTRATIONS

French operator ASF/VINCI Autoroutes Traffic Management system displaying VMS

Travel time information (France Italy networks) on the ASFA website

REFERENCES	
Documentation available on the project	
Web link	

1.1.2.3 Digitraffic – traffic situation open data

GENERAL INFORMATION	
Name of service/system/project	Digitraffic – traffic situation open data
Name of operator/organisation	Finnish Transport Agency
Service delivery	☒ Public ☐ Private
Mainly applicable Deployment Guideline	TIS-DG03 Traffic Condition and Travel Time Information Service
Other relevant Deployment Guideline(s)	TIS-DG02 Forecast and Real Time Event Information TIS-DG06 Weather Information Service
Contact for more information	Jari Myllärinen (jari.myllarinen@fta.fi)

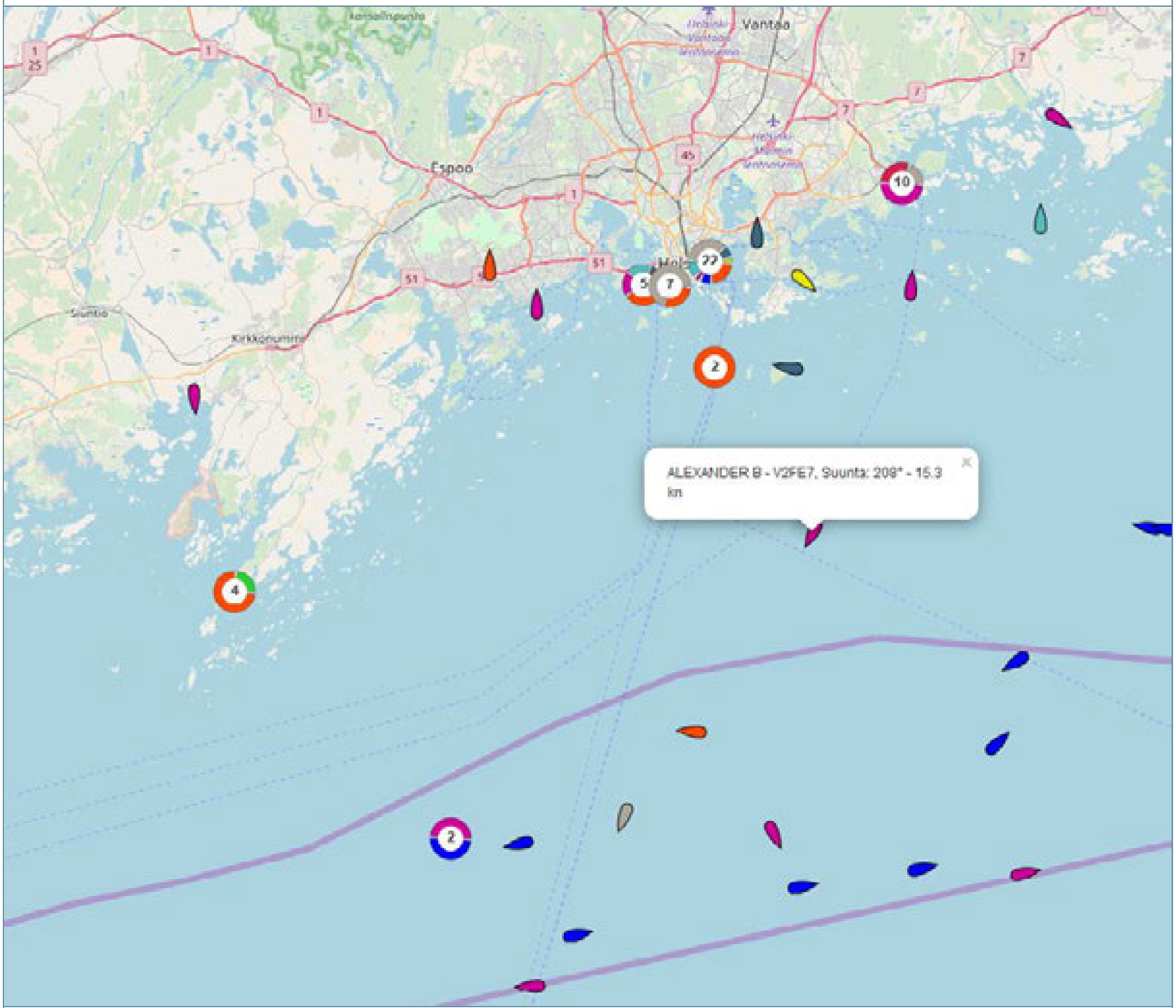
GEOGRAPHICAL ASPECTS	
Country	Finland
Region of implementation	Finland
Corridor(s) or Network(s) concerned	Finnish public road and rail network, Northern Baltic Sea and Lake Saimaa

ITS SERVICE DESCRIPTION	
General Objectives	☒ Reduction of congestion ☒ Increase of safety ☐ Reduction of environmental damage ☐ Protection of the road infrastructure ☐ Increase traveller comfort ☒ Other: Increase travellers' situation awareness ☒ Other: Improve operating conditions of the private service providers and to enable traffic-related service development
Specific Objectives	☒ Change the distribution in time of transport in order to achieve a more even allocation, avoiding peaks (access restrictions, fees) ☒ Change the distribution of transport in space in order to achieve a more even distribution on the network, and prevent "wrong vehicles on wrong places" (traffic control, traffic management, traffic information, access restrictions) ☐ Change the composition of vehicles on a certain piece of infrastructure (access restrictions, fees) ☐ Manage the flow on a given road section in order to reduce speed variation and thus improve the capacity and reduce the risk of incidents ☐ Manage access to a given road section in order to prevent disturbances and reduce the risk of incidents (e.g. ramp metering) ☐ Increase the speed on the link and thus increase capacity (throughput) ☒ Reduce the risk of incidents and traffic disruptions through better informed infrastructure users (traffic and traveller information) ☐ Reduce the consequences from disruptions through fast countermeasures (incident response time) ☐ Reduce traffic volumes through redistributing transport between transport modes ☐ Other: improve user route planning before and during the trip
Short narrative description of your best practice including e.g. geographical dimension, numbers, target group like HGV or passengers, costs etc.	Digitraffic is an open service for distributing real time traffic information about road, railway and marine traffic. The Finnish Transport Agency collects data for operative purposes and shares the data according to open data principles. Private companies can use the Digitraffic open data to support their own business and to develop commercial services. The end-user services can be ad-funded or chargeable. In addition, many services are run on recreation basis.
Relation with national access point set up according to EC Delegated Regulations	☒ Provide information to the national access point ☐ Receive information from the national access point ☐ No connection to the national access point
Information provision to end users	☒ Web portal ☐ Phone app ☐ VMS ☐ In-vehicle information ☒ Other

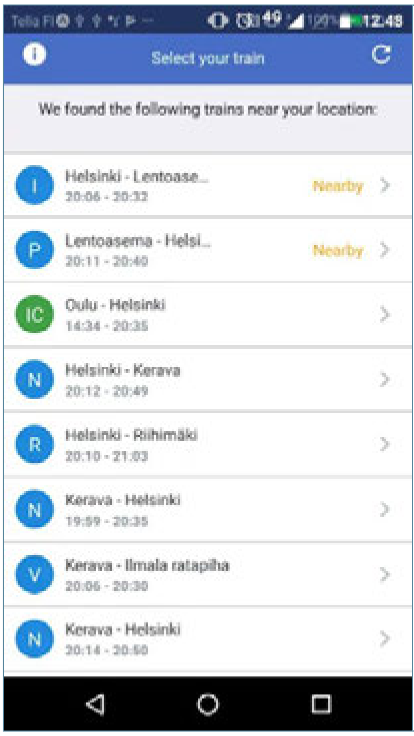
IMPLEMENTATION ASPECTS	
Year of implementation (+ end date of measure if applicable)	The Finnish Transport Agency has managed Digitraffic since 2013. Since then, Digitraffic has been fully open data and expanded to cover information from rail and marine traffic.
Technical description	Using the Digitraffic data is free and does not require contract with the Finnish Transport Agency. However, the licensing terms must be followed. Digitraffic data is licensed under the Creative Commons 4.0 By. Road traffic open data API currently includes: — TMS (Traffic Measurement System) data — Current free flow speeds (updated once a day) — Traffic disorder messages — Weight restrictions — Long-term roadworks — Road weather station data — Road weather forecasts — Road weather cameras — Metadata for all services Rail traffic open data currently includes: — Railway infrastructure network description — Railway works (current and becoming) — Train data — Tracking of active trains — Train GPS locations — Train tracking based on track sections — Train composition data Marine traffic open data API provides: — Marine warnings — Harbour schedules — Vessel location AIS — Vessel and harbour metadata Most of the end-user services using Digitraffic data have been developed without public funding and resources. The Finnish Transport Agency itself maintains a public web service http://liikennetilanne.liikennevirasto.fi/ Some examples of services using Digitraffic data are described below: **Liikennetilanne** (http://liikennetilanne.liikennevirasto.fi/) is a web service maintained by FTA providing real time traffic information on map regarding road, rail and marine traffic (please refer to Best Practice Traffic situation website). **Aluskartta.com** (http://www.aluskartta.com/) is a private web service and Android application showing real-time marine traffic on map, vessel information and port timetables. The service covers Northern Baltic Sea and Lake Saimaa. **Julia** (https://julia.dy.fi/) is a private web service showing real time-time timetables and traffic status of the Finnish rail network. The primary user group are people interested in trains and rail traffic. **Junanäyttö** is a private Android application which shows real-time timetables and delays of passenger trains. **Tässä.fi** (https://m.tassa.fi/) is a private web service and application (Android, iOS) providing road traffic and condition data in text format or on map as well as information about services nearby or on the route. **Tiesää Suomi** (https://roadweatherfinland.azurewebsites.net/) is a private web service showing weather station data and weather camera images across the Finnish road network.

Lessons learnt / factor of success / topics considered as good practice (technical, legal, organisational, financial)	The feedback from Digitraffic and FTA's open data policy has been very positive. According to the statistics the service is used widely and a wide range of different data types have been utilized. Access and use of traffic data and its analytics have become easier also internally in the Finnish Transport Agency. It is recommended to keep the data users closely involved in developing the interfaces and data distribution. Thereby the service can meet the user needs and common benefit is maximized. Digitraffic's railway data interfaces have been in cloud already for a while. Because of good experiences also road and marine data interfaces will be transferred to cloud in near future.
Impacts assessment / results (if available)	Impact evaluation has not been made. Some authorities and service providers have inquired a possibility for a quality assured access to Digitraffic data. Currently FTA does not guarantee Digitraffic's service reliability or data quality.

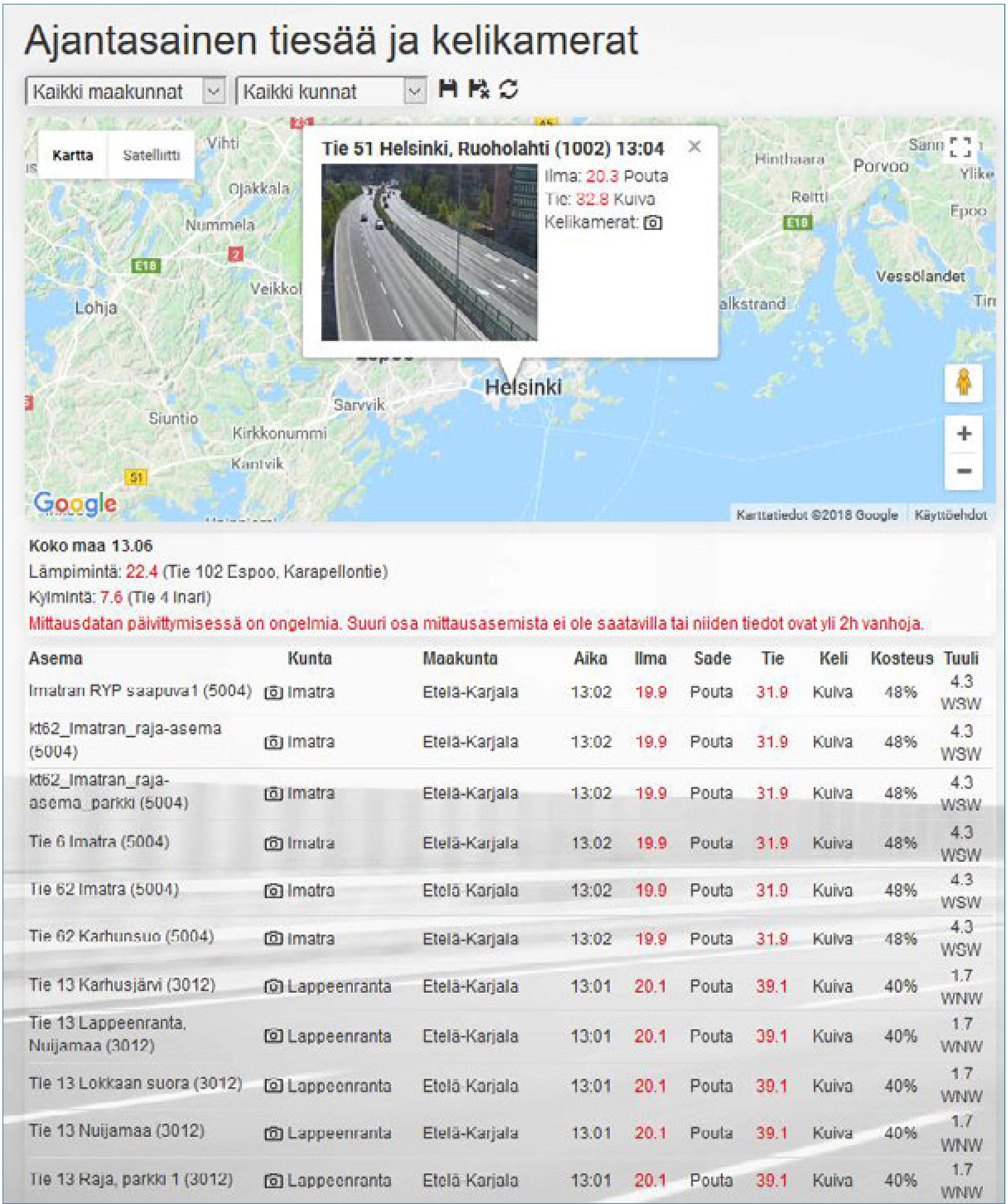
ILLUSTRATIONS



Aluskartta.com


Select your train
We found the following trains near your location:
Helsinki - Lentoase...
20:06 - 20:32
Nearby
Lentoasema - Helsi...
20:11 - 20:40
Nearby
Oulu - Helsinki
14:34 - 20:35
Helsinki - Kerava
20:12 - 20:49
Helsinki - Riihimäki
20:10 - 21:03
Kerava - Helsinki
19:59 - 20:35
Kerava - Ilmala ratapiha
20:06 - 20:30
Kerava - Helsinki
20:14 - 20:50

Junanäyttö



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kt62_Imatran_raja-asema (5004)	Imatra	Etelä-Karjala	13:02	19.9	Pouta	31.9	Kuiva	48%	4.3 WSW
kt62_Imatran_raja-asema_parkki (5004)	Imatra	Etelä-Karjala	13:02	19.9	Pouta	31.9	Kuiva	48%	4.3 WSW
Tie 6 Imatra (5004)	Imatra	Etelä-Karjala	13:02	19.9	Pouta	31.9	Kuiva	48%	4.3 WSW
Tie 62 Imatra (5004)	Imatra	Etelä-Karjala	13:02	19.9	Pouta	31.9	Kuiva	48%	4.3 WSW
Tie 62 Karhunsuo (5004)	Imatra	Etelä-Karjala	13:02	19.9	Pouta	31.9	Kuiva	48%	4.3 WSW
Tie 13 Karhusjärvi (3012)	Lappeenranta	Etelä-Karjala	13:01	20.1	Pouta	39.1	Kuiva	40%	1.7 WNW
Tie 13 Lappeenranta, Nuijamaa (3012)	Lappeenranta	Etelä-Karjala	13:01	20.1	Pouta	39.1	Kuiva	40%	1.7 WNW
Tie 13 Lokkaan suora (3012)	Lappeenranta	Etelä-Karjala	13:01	20.1	Pouta	39.1	Kuiva	40%	1.7 WNW
Tie 13 Nuijamaa (3012)	Lappeenranta	Etelä-Karjala	13:01	20.1	Pouta	39.1	Kuiva	40%	1.7 WNW
Tie 13 Raja, parkki 1 (3012)	Lappeenranta	Etelä-Karjala	13:01	20.1	Pouta	39.1	Kuiva	40%	1.7 WNW

Tiesää Suomi

REFERENCES	
Documentation available on the project	
Web link	http://digitraffic.liikennevirasto.fi/en/

1.1.2.4 Mobilitätsportal Rheinland-Pfalz (TIS Rheinland-Pfalz)

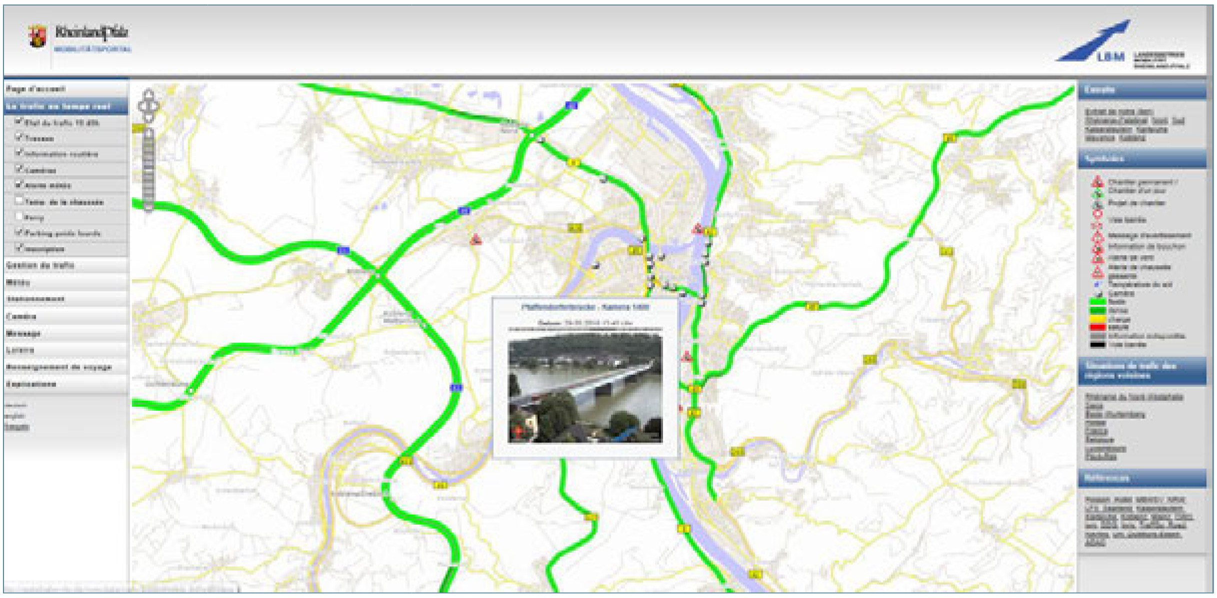
GENERAL INFORMATION	
Name of service/system/project	Mobilitätsportal Rheinland-Pfalz (TIS Rheinland-Pfalz)
Name of operator/organisation	Landesbetrieb Mobilität (Highways Agency) Rheinland-Pfalz
Service delivery	☒ Public ☐ Private
Mainly applicable Deployment Guideline	TIS-DG03, TIS-DG06
Other relevant Deployment Guideline(s)	
Contact for more information	telematik@lbm.rlp.de

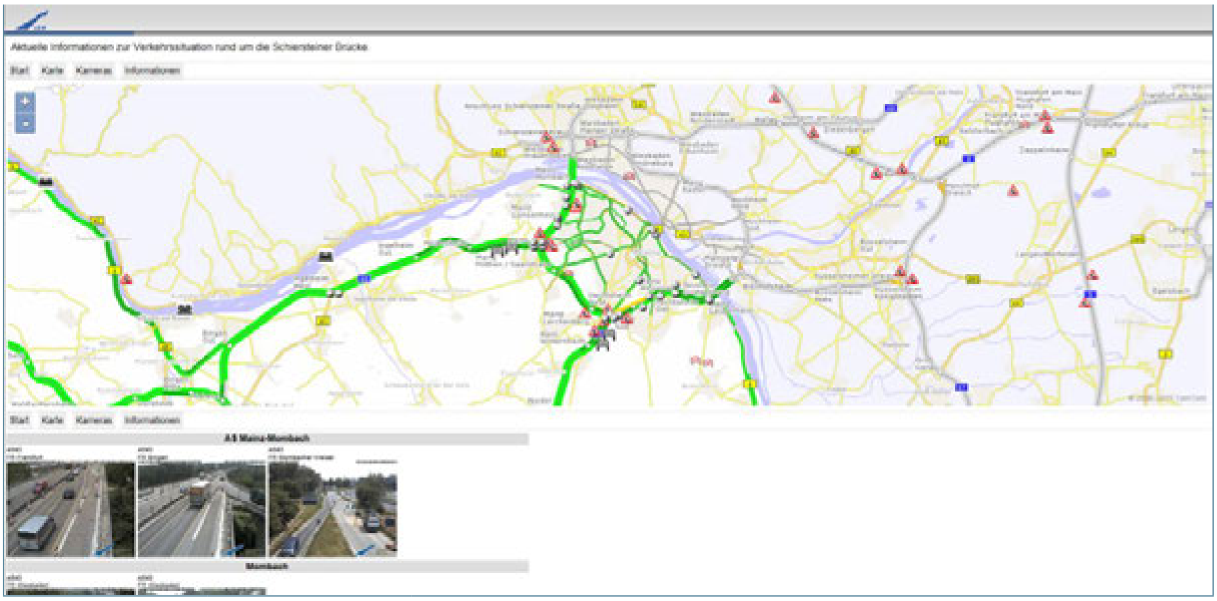
GEOGRAPHICAL ASPECTS	
Country	Germany
Region of implementation	Rheinland-Pfalz
Corridor(s) or Network(s) concerned	Ursa Major 2

ITS SERVICE DESCRIPTION	
General Objectives	☐ Reduction of congestion ☒ Increase of safety ☐ Reduction of environmental damage ☐ Protection of the road infrastructure ☒ Increase traveller comfort ☐ Other
Specific Objectives	☒ Change the distribution in time of transport in order to achieve a more even allocation, avoiding peaks (access restrictions, fees) ☐ Change the distribution of transport in space in order to achieve a more even distribution on the network, and prevent "wrong vehicles on wrong places" (traffic control, traffic management, traffic information, access restrictions) ☐ Change the composition of vehicles on a certain piece of infrastructure (access restrictions, fees) ☐ Manage the flow on a given road section in order to reduce speed variation and thus improve the capacity and reduce the risk of incidents ☐ Manage access to a given road section in order to prevent disturbances and reduce the risk of incidents (e.g. ramp metering) ☐ Increase the speed on the link and thus increase capacity (throughput) ☐ Reduce the risk of incidents and traffic disruptions through better informed infrastructure users (traffic and traveller information) ☐ Reduce the consequences from disruptions through fast countermeasures (incident response time) ☐ Reduce traffic volumes through redistributing transport between transport modes ☐ Other
Short narrative description of your best practice including e.g. geographical dimension, numbers, target group like HGV or passengers, costs etc.	Providing traveller information is a basic part of the highways agency infrastructure service to the road user. Especially the integration of webcams, the LBM was the first road operator in Germany in 2006, increase the popularity and acceptance of the TIS. The LBM will focus more and more on data source in its responsibility and will reduce the buying-in and integration of external data sources.
Relation with national access point set up according to EC Delegated Regulations	☐ Provide information to the national access point ☒ Receive information from the national access point ☐ No connection to the national access point
Information provision to end users	☒ Web portal ☒ Phone app ☐ VMS ☐ In-vehicle information ☐ Other

IMPLEMENTATION ASPECTS	
Year of implementation (+ end date of measure if applicable)	2004, 1st relaunch 2007, 2nd relaunch 2011
Technical description	The TIS Rheinland-Pfalz provides real-time traffic information for motorways and important federal roads connecting centers with motorways. Roadwork information based on LCL-reference will be provided, too. Further information is actual: images of IP-cams, TMC-information, temperature of surface, weather alerts, integration of German weather authority information, stops of public transport. The navigation bases on web-map-server-technology. The information is visible by ticking the information category. A digital map of TomTom is used. The information is provided in 3 languages: German, English and French.
Lessons learnt / factor of success / topics considered as good practice (technical, legal, organisational, financial)	IP-Cams are very accepted and give positive feedback. The TMC-information is generated by the police. The TMC is used for road works information, too and is often not consistent with the roadwork information system. TIS Rheinland-Pfalz will use only the road operator data source in future time in order to avoid contradictions.
Impacts assessment / results (if available)	The feedback of road users is positive especially in context with IP-cams. At severe weather and conditions during wintertime, the number of users increases distinctly.

ILLUSTRATIONS





REFERENCES	
Documentation available on the project	
Web link	www.verkehr.rlp.de; mobil.rlp.de

1.1.2.5 Network Control RheinMain Ost/Mittelhessen

GENERAL INFORMATION	
Name of service/system/project	Network Control RheinMain Ost/ Mittelhessen
Name of operator/organisation	Verkehrszentrale Hessen (Traffic Centre Hessen, VZH)
Service delivery	☒ Public ☐ Private
Mainly applicable Deployment Guideline	TIS-DG03-05_Travel Condition and Travel Time Information
Other relevant Deployment Guideline(s)	
Contact for more information	www.mobil.hessen.de/kontakt

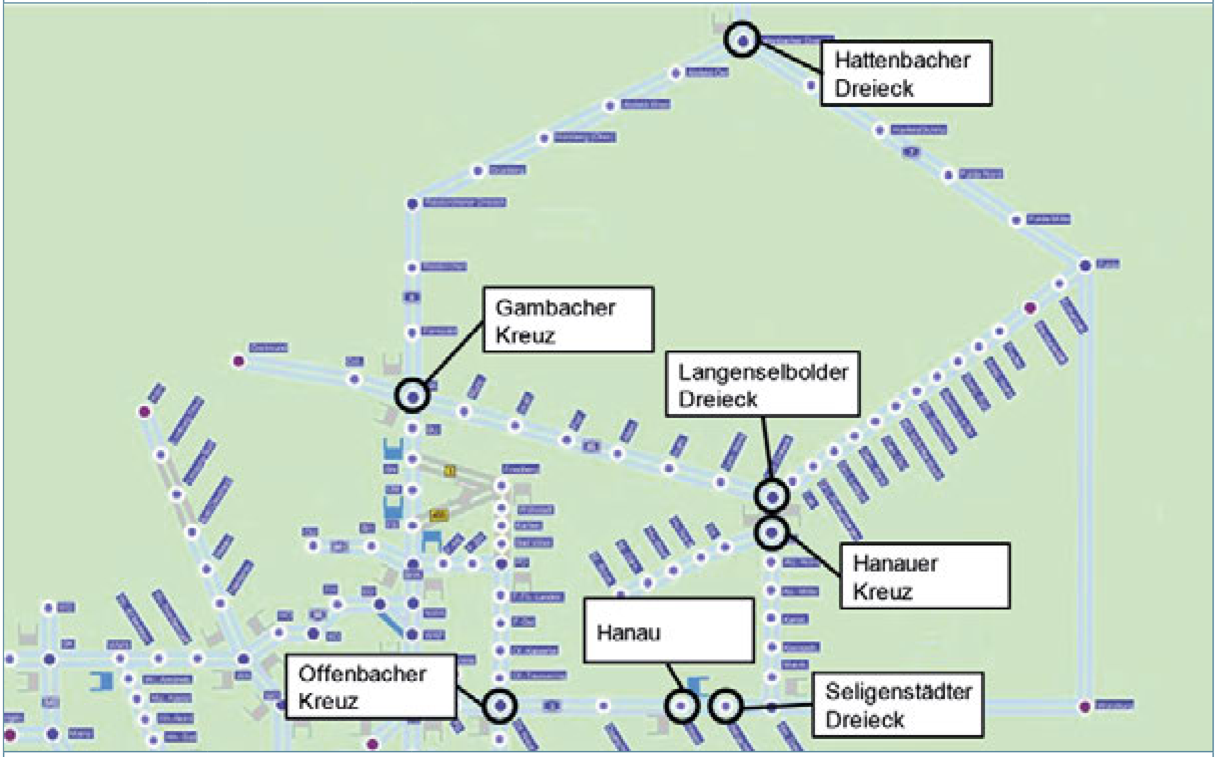
GEOGRAPHICAL ASPECTS	
Country	Germany
Region of implementation	RheinMain East/ Mittelhessen
Corridor(s) or Network(s) concerned	Ursa Major 2

ITS SERVICE DESCRIPTION	
General Objectives	☒ Reduction of congestion ☐ Increase of safety ☐ Reduction of environmental damage ☐ Protection of the road infrastructure ☒ Increase traveller comfort ☒ Other: Equal distribution of traffic in motorway network

Specific Objectives	☐ Change the distribution in time of transport in order to achieve a more even allocation, avoiding peaks (access restrictions, fees) ☒ Change the distribution of transport in space in order to achieve a more even distribution on the network, and prevent "wrong vehicles on wrong places" (traffic control, traffic management, traffic information, access restrictions) ☐ Change the composition of vehicles on a certain piece of infrastructure (access restrictions, fees) ☐ Manage the flow on a given road section in order to reduce speed variation and thus improve the capacity and reduce the risk of incidents ☐ Manage access to a given road section in order to prevent disturbances and reduce the risk of incidents (e.g. ramp metering) ☐ Increase the speed on the link and thus increase capacity (throughput) ☒ Reduce the risk of incidents and traffic disruptions through better informed infrastructure users (traffic and traveller information) ☒ Reduce the consequences from disruptions through fast countermeasures (incident response time) ☐ Reduce traffic volumes through redistributing transport between transport modes ☐ Other
Short narrative description of your best practice including e.g. geographical dimension, numbers, target group like HGV or passengers, costs etc.	The motorway A45 is one of three major links – besides A3, A61 – between the Frankfurt Rhein Main and the Rhein Ruhr metropolitan areas. Especially for long distance traffic, A45 offers alternative routing resp. detour when central metropolitan regions (Frankfurt, Cologne, Düsseldorf) are congested. On the other hand, in the next couple of years reconstruction works will be necessary at numerous bridges along the A45. Therefore, early and precise information at decision points for all road users is needed in case of road work closings and congestion. The motorway corridor A45 / A3 with links via A5, A661 and B45/B43a is daily used by thousands of road users and freight transport. To avoid congestion, a traffic collapse and the spreading of traffic into the road network of lower relevance in case of any incident, the dynamic rerouting system has been installed.
Relation with national access point set up according to EC Delegated Regulations	☒ Provide information to the national access point ☐ Receive information from the national access point ☐ No connection to the national access point
Information provision to end users	☐ Web portal ☐ Phone app ☒ VMS ☐ In-vehicle information ☒ Other: Radio

IMPLEMENTATION ASPECTS	
Year of implementation (+ end date of measure if applicable)	31.12.2014
Technical description	The Network Control Rhein-Main-Ost / Mittelhessen covers an important part of the TERN network. VMS were installed on 7 decision points on the A45 and connected links to inform all road users in case of road work closings and congestion.
Lessons learnt / factor of success / topics considered as good practice (technical, legal, organisational, financial)	
Impacts assessment / results (if available)	

ILLUSTRATIONS



Decision points for VMS

VMS at Gambacher Kreuz in direction to Frankfurt

REFERENCES	
Documentation available on the project	
Web link	

1.1.2.6 New and innovative dynamic signalization and traveller information system on ATMB network

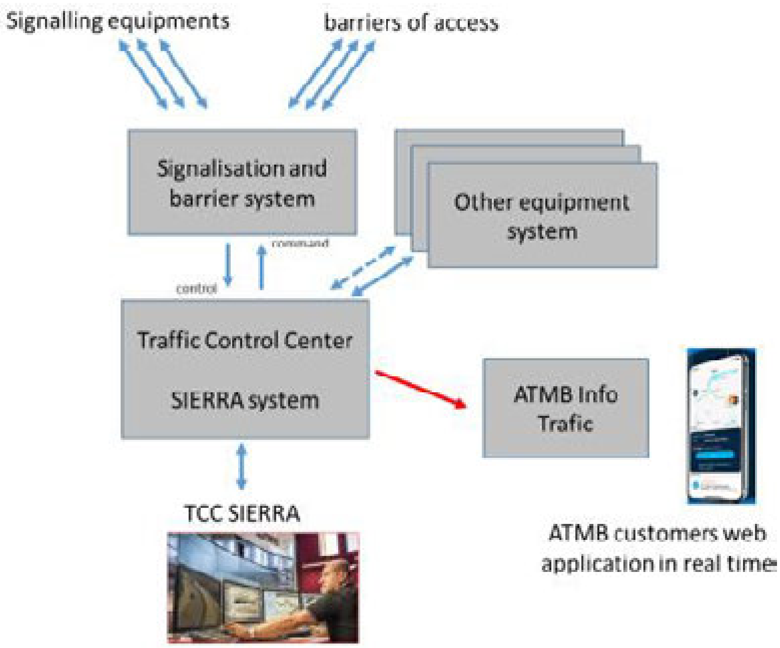
GENERAL INFORMATION	
Name of service/system/project	New and innovative dynamic signalisation and traveller information system on ATMB network
Name of operator/organisation	ATMB, French motorway operator (member of ASFA)
Service delivery	☒ Public ☐ Private
Mainly applicable Deployment Guideline	
Other relevant Deployment Guideline(s)	
Contact for more information	Jean-Noël Guyonnet Chief of Mobility Project ATMB +33 (0) 4 50 25 20 92 jean-noel.guyonnet@atmb.net

GEOGRAPHICAL ASPECTS	
Country	France
Region of implementation	The ATMB motorway network, linking Geneva, Mont Blanc Tunnel and Motorway to Lyon
Corridor(s) or Network(s) concerned	MEDTIS

ITS SERVICE DESCRIPTION	
General Objectives	☒ Reduction of congestion ☒ Increase of safety ☒ Reduction of environmental damage ☐ Protection of the road infrastructure ☒ Increase traveller comfort ☐ Other
Specific Objectives	☐ Change the distribution in time of transport in order to achieve a more even allocation, avoiding peaks (access restrictions, fees) ☒ Change the distribution of transport in space in order to achieve a more even distribution on the network, and prevent "wrong vehicles on wrong places" (traffic control, traffic management, traffic information, access restrictions) ☐ Change the composition of vehicles on a certain piece of infrastructure (access restrictions, fees) ☐ Manage the flow on a given road section in order to reduce speed variation and thus improve the capacity and reduce the risk of incidents ☒ Manage access to a given road section in order to prevent disturbances and reduce the risk of incidents (e.g. ramp metering) ☐ Increase the speed on the link and thus increase capacity (throughput) ☒ Reduce the risk of incidents and traffic disruptions through better informed infrastructure users (traffic and traveller information) ☒ Reduce the consequences from disruptions through fast countermeasures (incident response time) ☐ Reduce traffic volumes through redistributing transport between transport modes ☐ Other

Short narrative description of your best practice including e.g. geographical dimension, numbers, target group like HGV or passengers, costs etc.	The objective is to Improving traffic fluidity and safety, providing a better traffic monitoring and a better traffic information. This project of Dynamic signalization and traveler information, started in 2017, is still ongoing until year 2021, it aims to deploy, in the frame of the European project MedTIS3, on the ATMB network, in complement of radio broadcasting traffic information, new dynamic signage, new on-board information and new dynamic access controls devices on various interchanges. That traffic management is relying, in particular, on new cross-border traffic management plan, to handle the commuting traffic, particularly high at certain hours of the day between Geneva and France. Beyond the implementation of more numerous and performing new data collection systems, the deployment of new dynamic signing equipment makes it possible to better communicate on events that occur on the network and also to prohibit access to the motorway if necessary ▪ as example, as soon as a ghost vehicle is detected, the Traffic Control Center (called SIERRA for "Système Informatisé des Equipements Routiers du Réseau ATMB") automatically informs and controls the closure of all the access barriers to the motorway in the sector concerned. The deployment of a new dynamic safety signage allows, on sensitive spots to faster alert the motorists, in case of any queue occurring ahead ▪ as example, several VMS of that type have been implemented upstream of recurrent bottlenecks areas). The deployment of a new dynamic traffic information signage also provides more precise information on traffic conditions, allowing motorists to better manage their route ▪ as example, the SIERRA Traffic Control Center displays cross-border journey times on its traffic signs, such as to PALEXPO (Geneva Exhibition Palace) near the international airport in Switzerland, in order to better inform the huge cross-border commuting traffic between the ATMB network and Geneva. The implementation of a new web application ATMB Info Traffic, available on smartphones is also providing a full information program on motorway services and traffic conditions. The possibility of doubling and completing motorway dynamic signage and radio broadcasting traffic information with an on-board information allows a very high level and real time traffic information to motorists ▪ as example, the web application "ATMB Info Traffic" allows to see the overall traffic status on the network. It allows to view live the impact of events on our favorite routes, to know the traffic conditions, the messages displayed on the dynamic signs, the travel time forecast on the current route. It also allows to view webcams at different points in the network.
Relation with national access point set up according to EC Delegated Regulations	☒ Provide information to the national access point ☒ Receive information from the national access point ☐ No connection to the national access point
Information provision to end users	☒ Web portal ☒ Phone app ☒ VMS ☒ In-vehicle information ☐ Other: Radio

IMPLEMENTATION ASPECTS	
Year of implementation (+ end date of measure if applicable)	2021 (final deployment)

<table>
<tr><td>Technical description</td><td>The control and command of these various equipment and systems is carried out by the Traffic Control Center (TCC) “SIERRA”, which ensures from the center of the network, in Bonneville (Haute-Savoie), the monitoring of traffic and the coordination of all operations and traffic safety actions.
This Traffic Control Center operates 24/7, with high-performance decision support tools to manage the traffic on the entire network. It powers the ATMB customers web application in real time.
Below, the scheme of principles applied in the traffic management system to monitor and perform, from TCC SIERRA, the field equipment deployed.

</td></tr>
<tr><td>Lessons learnt / factor of success / topics considered as good practice
(technical, legal, organisational, financial)</td><td>The first deployments of the system already allow a better incident response time and a better motorist information and thus a better service on the motorway network, especially on cross border sections</td></tr>
<tr><td>Impacts assessment / results (if available)</td><td></td></tr>
</table>

<table>
<tr><th colspan="2">ILLUSTRATIONS</th></tr>
<tr><td>Geographical ATMB network location</td><td>
</td></tr>
</table>

Operation room of the TCC SIERRA

Information access to motorway with access barrier

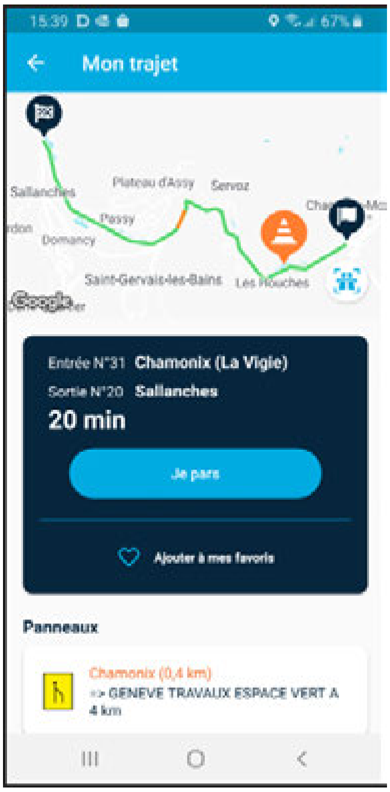
Dynamic safety signage on sensitive spots to faster alert the motorists in case of any queue occurring ahead

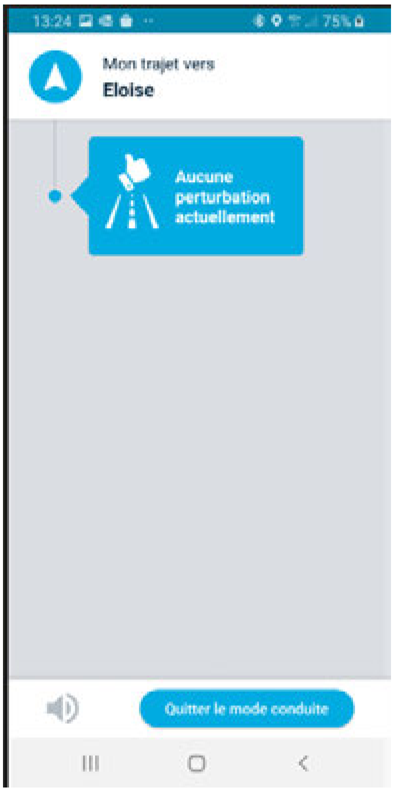
Dynamic information of the cross-border travel time to PALEXPO (Geneva Exhibition Palace) near the international airport in Switzerland from St Julien-en-Genevois in France

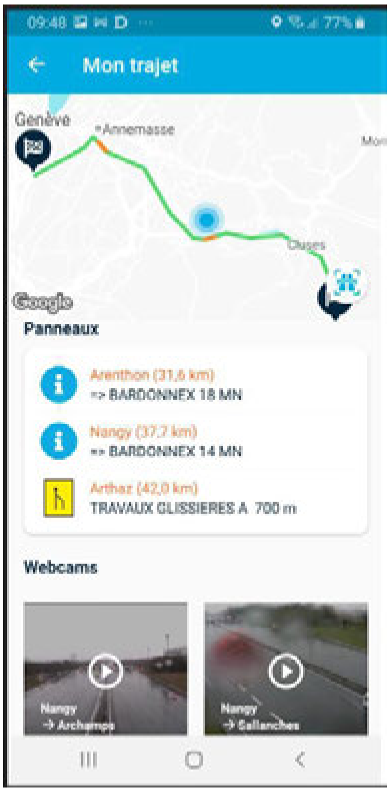
Dynamic information of the travel time to Bardonnex (customs between France and Switzerland)

The web application ATMB Info Traffic allows to view live the impact of events on our favorite routes, to know the traffic conditions, the messages displayed on the dynamic signs, the travel time forecast on the current route. It also allows to view webcams on different points in the network.

The app's launch icon







REFERENCES	
Documentation available on the project	
Web link	

1.1.2.7 ŘSD dopravní informace (mobile application)

GENERAL INFORMATION	
Name of service/system/project	ŘSD dopravní informace (mobile application)
Name of operator/organisation	Road & Motorway Directorate of the Czech Republic (ŘSD ČR)
Service delivery	☒ Public ☐ Private
Mainly applicable Deployment Guideline	TIS-DG03-05 (Traffic Condition and Travel Time Information Service)
Other relevant Deployment Guideline(s)	TIS-DG06 (Weather Information Service)
Contact for more information	Filip Týc (email: filip.tyc@rsd.cz)

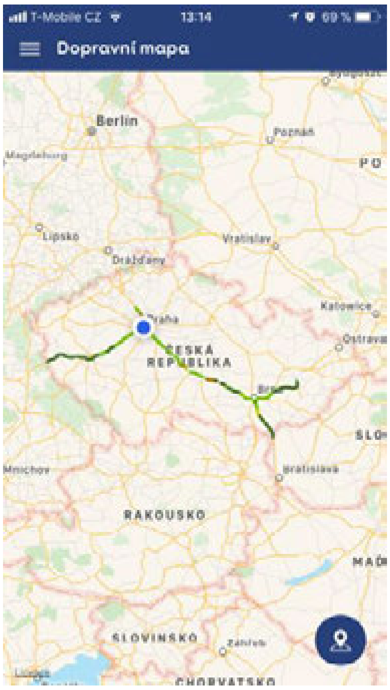
GEOGRAPHICAL ASPECTS	
Country	Czech Republic (CZ)
Region of implementation	Czech Republic
Corridor(s) or Network(s) concerned	Roads of all network categories

ITS SERVICE DESCRIPTION	
General Objectives	☒ Reduction of congestion ☒ Increase of safety ☒ Reduction of environmental damage ☐ Protection of the road infrastructure ☒ Increase traveller comfort ☐ Other
Specific Objectives	☒ Change the distribution in time of transport in order to achieve a more even allocation, avoiding peaks (access restrictions, fees) ☒ Change the distribution of transport in space in order to achieve a more even distribution on the network, and prevent "wrong vehicles on wrong places" (traffic control, traffic management, traffic information, access restrictions) ☐ Change the composition of vehicles on a certain piece of infrastructure (access restrictions, fees) ☐ Manage the flow on a given road section in order to reduce speed variation and thus improve the capacity and reduce the risk of incidents ☐ Manage access to a given road section in order to prevent disturbances and reduce the risk of incidents (e.g. ramp metering) ☐ Increase the speed on the link and thus increase capacity (throughput) ☒ Reduce the risk of incidents and traffic disruptions through better informed infrastructure users (traffic and traveller information) ☐ Reduce the consequences from disruptions through fast countermeasures (incident response time) ☐ Reduce traffic volumes through redistributing transport between transport modes ☐ Other

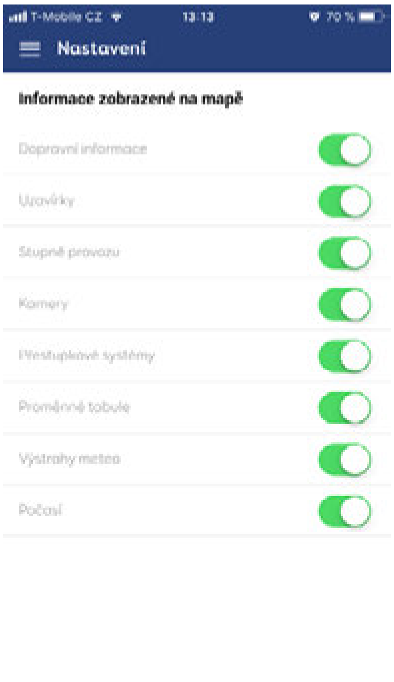
Short narrative description of your best practice including e.g. geographical dimension, numbers, target group like HGV or passengers, costs etc.	This mobile application is focused on **informing the drivers**. Information is provided by National Traffic Information Centre (NDIC), which provides non-stop operation to collect, process, share, publish and distribute data and **real-time information** on current traffic situation from the network of **all road categories** in the Czech Republic. The NDIC gathers information on traffic accidents, closures, weather and other situations. Information is distributed from NDIC to VMS, websites as well as radio stations or telecommunication operators. Detailed traffic information is distributed 24/7 using the RDS-TMC service. Drivers can obtain the same information both via NDIC official website (www.dopravniinfo.cz) and via this mobile application. However, this application is more user (driver) friendly than website for drivers because it was created for mobile devices. This application is suitable for drivers who want to know current traffic information on the route before setting out. First of all, driver set the starting point and the destination place. After that, the itinerary and the interactive map of route appears. Driver can see the position of relevant **obstacles**, **closures** with detailed information, **accidents**, **VMS**, **speed limit enforcement** and **weather condition**. Driver can even see **real-time traffic cam view** via this application. Level of Service is also displayed, but just for the most important motorways. This application is **free of charge**.
Relation with national access point set up according to EC Delegated Regulations	☐ Provide information to the national access point ☒ Receive information from the national access point ☐ No connection to the national access point
Information provision to end users	☐ Web portal ☒ Phone app ☐ VMS ☐ In-vehicle information ☐ Other: Radio

IMPLEMENTATION ASPECTS	
Year of implementation (+ end date of measure if applicable)	2017
Technical description	It uses smartphone internal GPS navigation module, which means this application is able to display current driver's position. However, this is not a navigation application. Its purpose is just informing the drivers. It is both in Czech and English language version and the internet connection is required. This application uses the information provided by NDIC. This centre (NDIC) gather data provided by: ▪ Police, Fire rescue service, Emergency medical service ▪ Road managers of all network categories ▪ Road maintenance authorities ▪ Czech Hydrometeorological Institute ▪ Traffic cam system (approx. 600 cams) ▪ Traffic intensity detection system (over 200 detectors) ▪ Road meteo system (approx. 270 meteo sensors) ▪ Electronic toll collection system ▪ Road line traffic control system ▪ Traffic counting system ▪ Tunnel control systems ▪ City traffic information centre systems
Lessons learnt / factor of success / topics considered as good practice (technical, legal, organisational, financial)	This application was financed within CROCODILE 2 (CEF Transport). It was created by CTECH, s.r.o. company in cooperation with VARS BRNO, a.s. company and it is available for iOS, Android and Windows Mobile (Windows Phone).
Impacts assessment / results (if available)	Results of evaluation are not available so far.

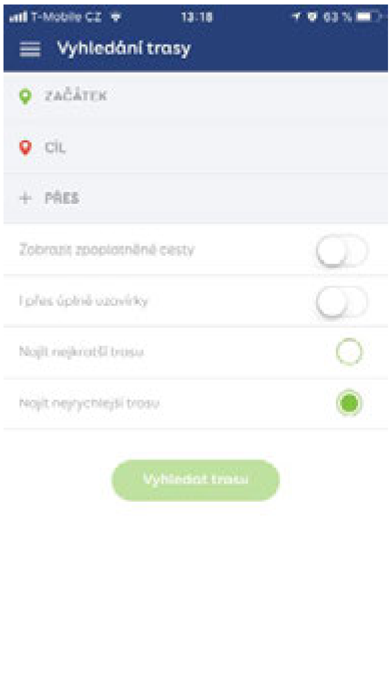
ILLUSTRATIONS



MAP



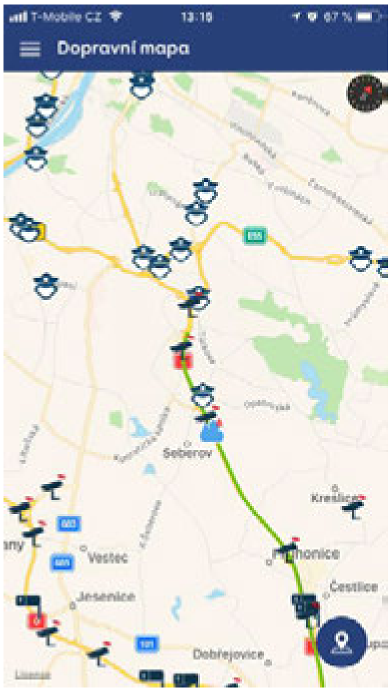
AVAILABLE INFORMATION



ROUTE PLANNER

LEVEL OF SERVICE

TRAFFIC CAM VIEW



MAP (DETAIL)

REFERENCES

Documentation available on the project	Not Available
Web link	http://portal.dopravniinfo.cz/servis-ridicum/mobilni-aplikace

1.1.2.8 Traffic Information Service Hessen

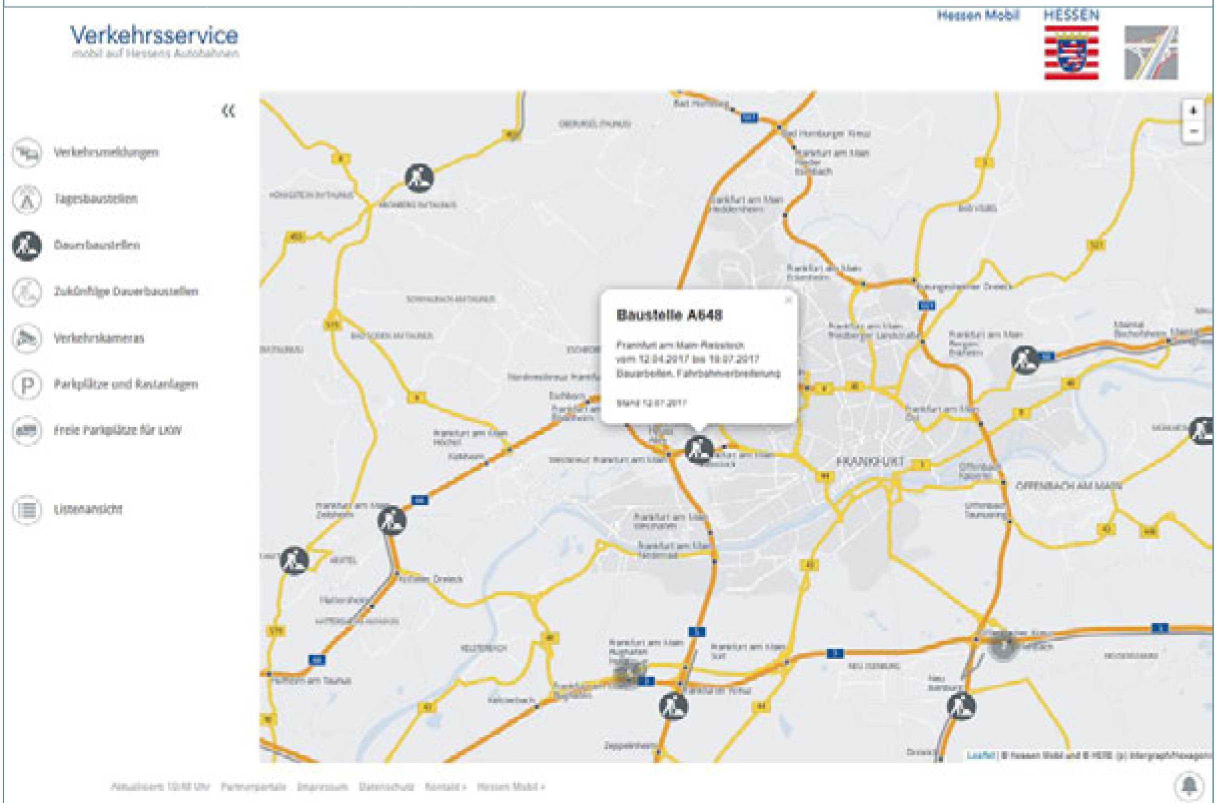
GENERAL INFORMATION	
Name of service/system/project	Traffic Information Service Hessen
Name of operator/organisation	Verkehrszentrale Hessen (Traffic Centre Hessen, VZH)
Service delivery	☒ Public ☐ Private
Mainly applicable Deployment Guideline	TIS-DG03-05_Travel Condition and Travel Time Information
Other relevant Deployment Guideline(s)	
Contact for more information	www.mobil.hessen.de/kontakt

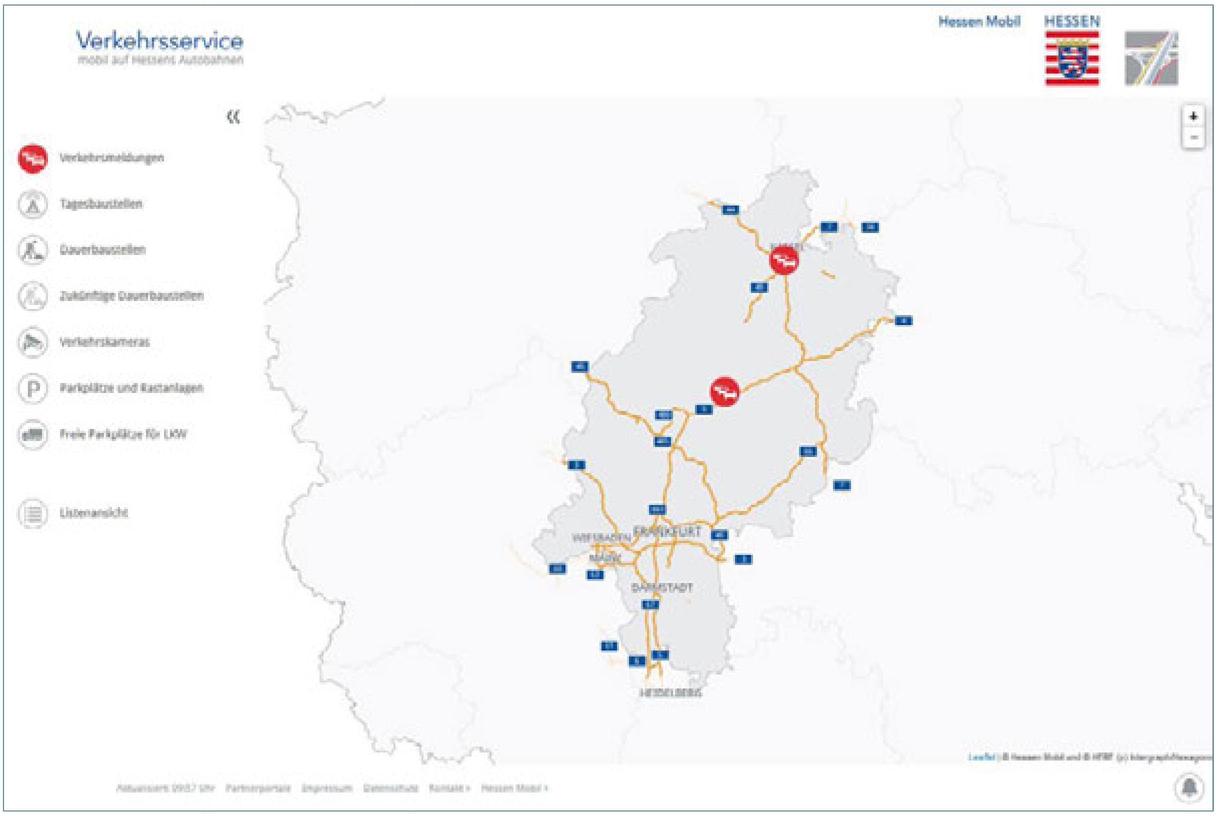
GEOGRAPHICAL ASPECTS	
Country	Germany
Region of implementation	Hessen
Corridor(s) or Network(s) concerned	URSA MAJOR 2

ITS SERVICE DESCRIPTION	
General Objectives	☒ Reduction of congestion ☒ Increase of safety ☐ Reduction of environmental damage ☐ Protection of the road infrastructure ☒ Increase traveller comfort ☐ Other
Specific Objectives	☐ Change the distribution in time of transport in order to achieve a more even allocation, avoiding peaks (access restrictions, fees) ☐ Change the distribution of transport in space in order to achieve a more even distribution on the network, and prevent "wrong vehicles on wrong places" (traffic control, traffic management, traffic information, access restrictions) ☐ Change the composition of vehicles on a certain piece of infrastructure (access restrictions, fees) ☐ Manage the flow on a given road section in order to reduce speed variation and thus improve the capacity and reduce the risk of incidents ☐ Manage access to a given road section in order to prevent disturbances and reduce the risk of incidents (e.g. ramp metering) ☐ Increase the speed on the link and thus increase capacity (throughput) ☒ Reduce the risk of incidents and traffic disruptions through better informed infrastructure users (traffic and traveller information) ☐ Reduce the consequences from disruptions through fast countermeasures (incident response time) ☐ Reduce traffic volumes through redistributing transport between transport modes ☐ Other
Short narrative description of your best practice including e.g. geographical dimension, numbers, target group like HGV or passengers, costs etc.	Using this traffic service portal on the internet and smartphones Hessen Mobil has the possibility to offer all road users a broad spectrum of high-quality traffic information which are prepared optically new and appealingly. The new web page is responsive and can adapted resolution and display to each end device.
Relation with national access point set up according to EC Delegated Regulations	☒ Provide information to the national access point ☐ Receive information from the national access point ☐ No connection to the national access point
Information provision to end users	☒ Web portal ☒ Phone app ☐ VMS ☐ In-vehicle information ☐ Other

IMPLEMENTATION ASPECTS	
Year of implementation (+ end date of measure if applicable)	23.05.2016
Technical description	The traffic service portal is now running on the internet and smartphones and offers the following services to the road users: ▪ road works information ▪ traffic jam messages ▪ information for parking areas ▪ live videos of relevant intersections
Lessons learnt / factor of success / topics considered as good practice (technical, legal, organisational, financial)	
Impacts assessment / results (if available)	The analysis of the web statistics shows that the traffic information service is used by the citiziens regularly. Also, the incoming public inquiries prove that the traffic information service is used and will be used in the future. Questions and suggestions for the improvement of the service are an indicator for this. In generally, the traffic information service get positive feedback by the users.

ILLUSTRATIONS





REFERENCES	
Documentation available on the project	Quality report of traffic information service (June – December 2016) Statistics of website visitors (January – March 2017)
Web link	http://verkehrsservice.hessen.de/

1.1.2.9 Traffic Scotland Journey Time System

GENERAL INFORMATION	
Name of service/system/project	Traffic Scotland Journey Time System
Name of operator/organisation	Transport Scotland
Service delivery	☒ Public ☐ Private
Mainly applicable Deployment Guideline	Traffic Condition and Travel Time
Other relevant Deployment Guideline(s)	
Contact for more information	Peter McGillion, Transport Scotland e: Peter.McGillion@transport.gov.scot

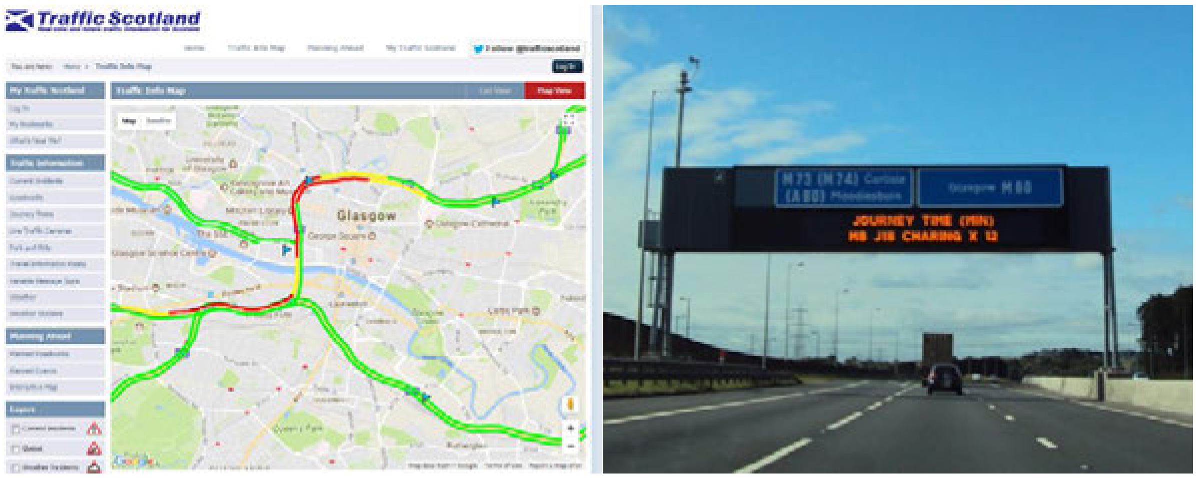
GEOGRAPHICAL ASPECTS	
Country	Scotland, UK
Region of implementation	Scotland, UK
Corridor(s) or Network(s) concerned	Trunk Road Network including Arc Atlantique Corridor

ITS SERVICE DESCRIPTION	
General Objectives	☐ Reduction of congestion ☐ Increase of safety ☐ Reduction of environmental damage ☐ Protection of the road infrastructure ☒ Increase traveller comfort ☐ Other
Specific Objectives	☐ Change the distribution in time of transport in order to achieve a more even allocation, avoiding peaks (access restrictions, fees) ☒ Change the distribution of transport in space in order to achieve a more even distribution on the network, and prevent "wrong vehicles on wrong places" (traffic control, traffic management, traffic information, access restrictions) ☐ Change the composition of vehicles on a certain piece of infrastructure (access restrictions, fees) ☐ Manage the flow on a given road section in order to reduce speed variation and thus improve the capacity and reduce the risk of incidents ☐ Manage access to a given road section in order to prevent disturbances and reduce the risk of incidents (e.g. ramp metering) ☐ Increase the speed on the link and thus increase capacity (throughput) ☒ Reduce the risk of incidents and traffic disruptions through better informed infrastructure users (traffic and traveller information) ☐ Reduce the consequences from disruptions through fast countermeasures (incident response time) ☐ Reduce traffic volumes through redistributing transport between transport modes ☐ Other:
Short narrative description of your best practice including e.g. geographical dimension, numbers, target group like HGV or passengers, costs etc.	Real-time journey time information is a core element of the Traffic Scotland Information Services and key in improving the efficiency of the motorway and trunk road network. Since initial journey time work in 2002 the service has continued to be improved and geographically expanded. The service has also evolved in its delivery, technological solutions and the adoption of new partnerships: ▪ Journey times available in the public web services, VMS, DATEX feed and used for traffic management purposes on the Dashboard ▪ The service now uses a range of technologies to gather data including ANPR, TMUs and Bluetooth units ▪ Partnerships with Local Authorities have been built to provide seamless cross-jurisdictional journey times, making best use of resources and expertise Traffic congestion condition information is also collected / sourced and displayed.
Relation with national access point set up according to EC Delegated Regulations	☒ Provide information to the national access point ☐ Receive information from the national access point ☐ No connection to the national access point
Information provision to end users	☒ Web portal ☐ Phone app ☒ VMS ☐ In-vehicle information ☐ Other: Mobile website

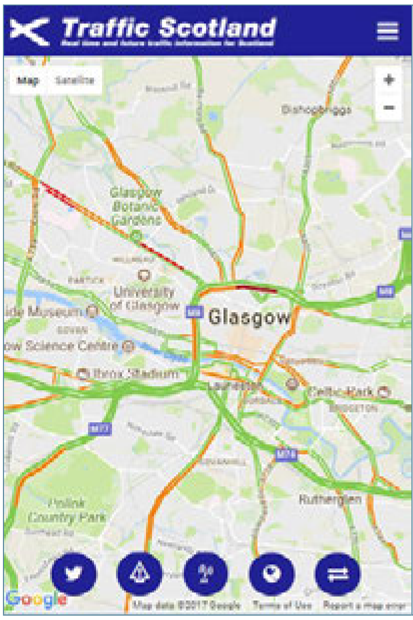
IMPLEMENTATION ASPECTS	
Year of implementation (+ end date of measure if applicable)	Travel times - Initial loop-based algorithm implemented in 2002. Subsequent phases to increase geographic coverage, include additional data sources, algorithm optimisation, data storage, widen system outputs, and improve visualisation tools.

Technical description	The Journey Time System: ▪ Collects and store raw journey time data from multiple sources (inc. ANPR, TMUs and Bluetooth units) ▪ Fuses the raw journey time data onto a common spatial and temporal network to produce link and route journey times ▪ Processes, calculate and maintain journey time profile data for routes and links ▪ Journey time prediction algorithm ▪ Provides a source of journey time information to be shared through roadside VMS and web based information services, including the Traffic Scotland websites ▪ Generates journey time alerts and events ▪ Provides an interface that allows other systems to retrieve real-time journey time data ▪ Provides a web-based tool that allows the Traffic Scotland Operator and other stakeholders to display and visualise real-time journey time related data on a map-based display ▪ Provides a web-based reporting tool for querying and extracting journey time data ▪ Collects journey time data via DATEX 2 from Highways England and Edinburgh City ▪ Published via Traffic Scotland DATEX 2 feed The Congestion layer ▪ Traffic monitoring unit data is used to derive Transport Scotland congestion data on limited sections of the network ▪ Google Maps congestion layer is another data source
Lessons learnt / factor of success / topics considered as good practice (technical, legal, organisational, financial)	Data sharing, improving quality by using multiple sources, cooperation with neighbouring authorities
Impacts assessment / results (if available)	

ILLUSTRATIONS



Map based journey time presentation (left) and VMS journey time presentation (right)



Traffic congestion display on mobile site

REFERENCES	
Documentation available on the project	
Web link	Mobile - https://my.trafficscotland.org/ Desktop - https://trafficscotland.org/

1.1.2.10 Traffic Scotland Web Service

GENERAL INFORMATION	
Name of service/system/project	Traffic Scotland Web Service
Name of operator/organisation	Transport Scotland
Service delivery	☒ Public ☐ Private
Mainly applicable Deployment Guideline	TIS-DG03-05
Other relevant Deployment Guideline(s)	No other relevant DGs
Contact for more information	Peter.McGillion@transportscotland .gsi.gov.uk

GEOGRAPHICAL ASPECTS	
Country	Scotland (UK)
Region of implementation	Scotland
Corridor(s) or Network(s) concerned	Arc Atlantique; Traffic Scotland covers the entire Scottish trunk road network. Information covering Northern England is also available for some types of incidents.

ITS SERVICE DESCRIPTION	
General Objectives	☒ Reduction of congestion ☐ Increase of safety ☒ Reduction of environmental damage ☐ Protection of the road infrastructure ☒ Increase traveller comfort ☐ Other

Specific Objectives	☒ Change the distribution in time of transport in order to achieve a more even allocation, avoiding peaks (access restrictions, fees) ☒ Change the distribution of transport in space in order to achieve a more even distribution on the network, and prevent "wrong vehicles on wrong places" (traffic control, traffic management, traffic information, access restrictions) ☐ Change the composition of vehicles on a certain piece of infrastructure (access restrictions, fees) ☐ Manage the flow on a given road section in order to reduce speed variation and thus improve the capacity and reduce the risk of incidents ☐ Manage access to a given road section in order to prevent disturbances and reduce the risk of incidents (e.g. ramp metering) ☐ Increase the speed on the link and thus increase capacity (throughput) ☒ Reduce the risk of incidents and traffic disruptions through better informed infrastructure users (traffic and traveller information) ☐ Reduce the consequences from disruptions through fast countermeasures (incident response time) ☒ Reduce traffic volumes through redistributing transport between transport modes ☐ Other
Short narrative description of your best practice including e.g. geographical dimension, numbers, target group like HGV or passengers, costs etc.	The Traffic Scotland Web Service is a vital element of the integrated Traffic Management and Control System. Traffic Scotland provides real-time information on the Scottish road network to the travelling public. The purpose of the service is to help drivers make informed choices about the timing, routing and travel mode for current or future journeys. Traffic Scotland is constantly looking at more effective ways to reach the travelling public using methods that match with modern technology-driven lifestyles (internet radio, twitter feed, mobile site, smartphone app). All Traffic Scotland services are free to the public.
Relation with national access point set up according to EC Delegated Regulations	☐ Provide information to the national access point ☒ Receive information from the national access point ☐ No connection to the national access point
Information provision to end users	☒ Web portal ☒ Phone app ☒ VMS ☐ In-vehicle information ☐ Other: Radio

IMPLEMENTATION ASPECTS	
Year of implementation (+ end date of measure if applicable)	2011 (2015)

Technical description	With specific reference to real-time information, the following detail is provided: Traffic Scotland provides real-time Traffic Information including information on incidents, roadworks, weather and congestion. Information is also provided about future roadworks and events. Additionally, live traffic camera images of traffic conditions on a limited selection of locations can be observed on the web site. Traffic Information displayed on the web site is automatically updated every 3 minutes. For Incidents is provided the details listed below: *Date (day, date); Start Time (hh.mm.ss); Location (point / junction/ route); Direction (i.e. northbound); Type (accident, fluid spill);* *Description of impact (lanes closed, lanes restricted etc).* For roadworks the details provided is: *Reported delay information; Week of commencement; Start Date / Time (Date, Date, Time); End Date / Time (Date, Date, Time); Location(point / junction/ route); Description (work being carried out); Days affected.* All text is provided in English. On mapping information is provided independent of language: Icons used to show incidents, queues, roadworks. Colours used to road congestion / travel time links. DATEX II used to exchange travel time data with Edinburgh City Council connecting Transport Scotland TEN-T and local interfacing routes. DATEX II used to exchange travel time data with Edinburgh City Council connecting Transport Scotland TEN-T and local interfacing routes. Level of Detail (Location Reference) used dependant on type: *Point location (i.e. bridge / junction) for incidents* *Junction reference (i.e. M8 J1 – J3) for roadworks / hazards / queues.* At present journey times are only provided for particular sections of the Scottish trunk road network, where access to journey time monitoring equipment are available. The road network model is constructed from individual sections of road (e.g. junction to junction), each with their own specific journey times for both directions. A journey time represents the current (or recently calculated) time taken to travel along a road section. Route journey times between two locations (major junctions) are calculated by aggregating the journey times for all the road sections between the start and end points of the route. Journey times are calculated using a combination of historic and real time data from various data sources. Current data will always be used in preference to historic data. The journey times from the different data sources are fused to give the current journey times for individual sections. Current journey times are also compared with historic (normal) journey times and may cause a journey time alert to be generated. This data are updated every 3 to 5 minutes. The Interactive Map is a new service (April 2015) which will provide geo-located information relating to possible impacts to the trunk road network during the user specified time period. Information is provided (where available) up to 6 months in advance of the current date. Information is valid on the date which the map is utilised and can be subject to change. Information may also be changed, added or removed over the course of the 6 months, which makes it important that users check the map on a regular basis for anything which may impact the journey on the Trunk Road Network.
Lessons learnt / factor of success / topics considered as good practice (technical, legal, organisational, financial)	Cooperation with external partners (i.e. organisers, local authorities, and the police) is a key when providing traffic information to the public on large events. From legal point of view topics about the use of data and information available on the website requires restrictions, as for example the webcam. The Scottish Government retains the full copyright of all live traffic camera images. Traffic Scotland users may not hyperlink directly to the traffic camera images. Users identified as actively hyperlinking directly to the traffic camera images may be banned from accessing the site. Technical topic: every effort has been made to ensure the Traffic Scotland web site is usable by the majority of visitors. A modern web browser like Firefox, Safari, Internet Explorer or Opera will give the best browsing experience for the dynamic portions of the site, but the content should be accessible to any browsing device. The Traffic Scotland web site includes Park and Ride information for a number of sites in Scotland. The information provided includes location and onward travel details. For further information on Park and Ride sites users are advised to visit the specific web sites of each scheme (included in the List View table for Park and Ride). Traffic Scotland is operated by the Traffic Scotland Operator (Amey) from the Traffic Scotland National Control Centre (TSNCC). The TSNCC operates 24-hours a day and is open every day of the year.

Impacts assessment / results (if available)	Carbon Footprint: calculating carbon emissions for selected routes Traffic Scotland try to provide an accurate comparison between car travel and existing public transport which can result in different distances between road and rail travel in the calculation. If users are interested in comparing transport modes over the same distances then the 'specific mileage' calculation method provides this information. As the occupancy of a car is increased, it's carbon emission value decreases. This is due to the assumption that by increasing the number of occupants in the car you are saving on carbon by preventing those occupants from undertaking their own additional journeys. Traffic Scotland carbon calculator should not be deemed an instruction on how to travel but rather as an aid when deciding which mode of transport to use for your journey

ILLUSTRATIONS

Starting point: M77 J7 Fenwick Show Destinations

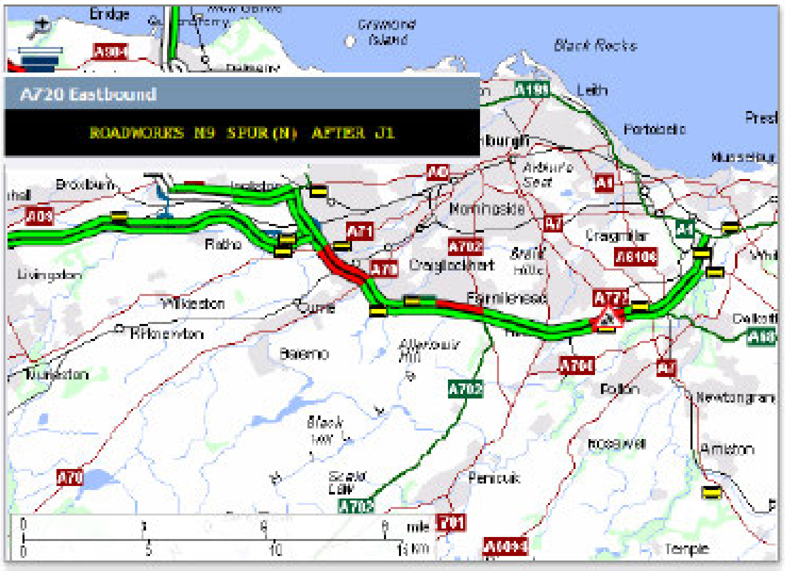
Destination	Current Journey Time	Typical Journey Time	Delay	Distance	Average Speed
M8 J8 Baillieston	27 mins	26 mins	Less than 1 minute	38.8 km / 24.1 miles	86 km/h / 54 mph
M8 J19 Anderston	19 mins	18 mins	Less than 1 minute	26.9 km / 16.7 miles	86 km/h / 54 mph
M80 Crow Wood	27 mins	26 mins	Less than 1 minute	37.4 km / 23.2 miles	85 km/h / 53 mph
M8 J1 Hermiston Gait	59 mins	59 mins	No delay	89.9 km / 55.9 miles	93 km/h / 58 mph

No delay Minor delay Significant delay

Example of journey time table

Real time represented on mobile version

Real time information on web map



REFERENCES	
Documentation available on the project	
Web link	http://trafficscotland.org

1.1.2.11 Traffic situation website and mobile app

GENERAL INFORMATION	
Name of service/system/project	Traffic situation website and mobile app
Name of operator/organisation	Traffic Management Finland Group (state-owned company responsible for traffic management),
Service delivery	☒ Public ☐ Private
Mainly applicable Deployment Guideline	TIS-DG03 Traffic Condition and Travel Time Information
Other relevant Deployment Guideline(s)	TIS-DG02 Forecast and Real Time Event Information
Contact for more information	Mika Ahvenainen, mika.ahvenainen@tmfg.fi

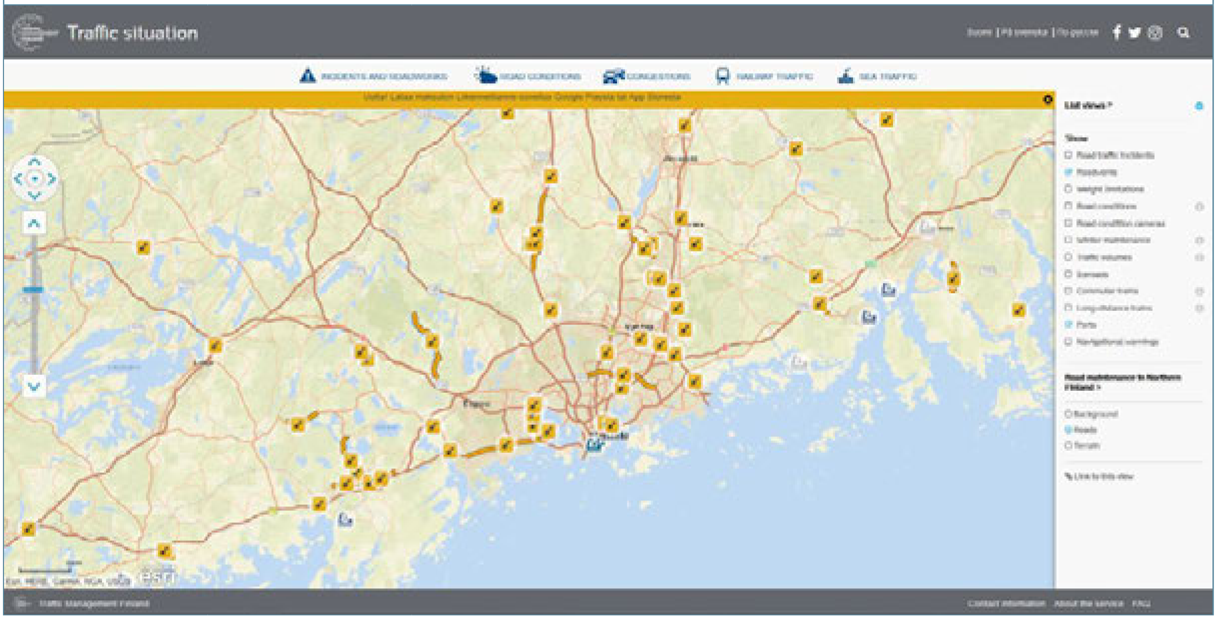
GEOGRAPHICAL ASPECTS	
Country	Finland
Region of implementation	Finland
Corridor(s) or Network(s) concerned	Main road network

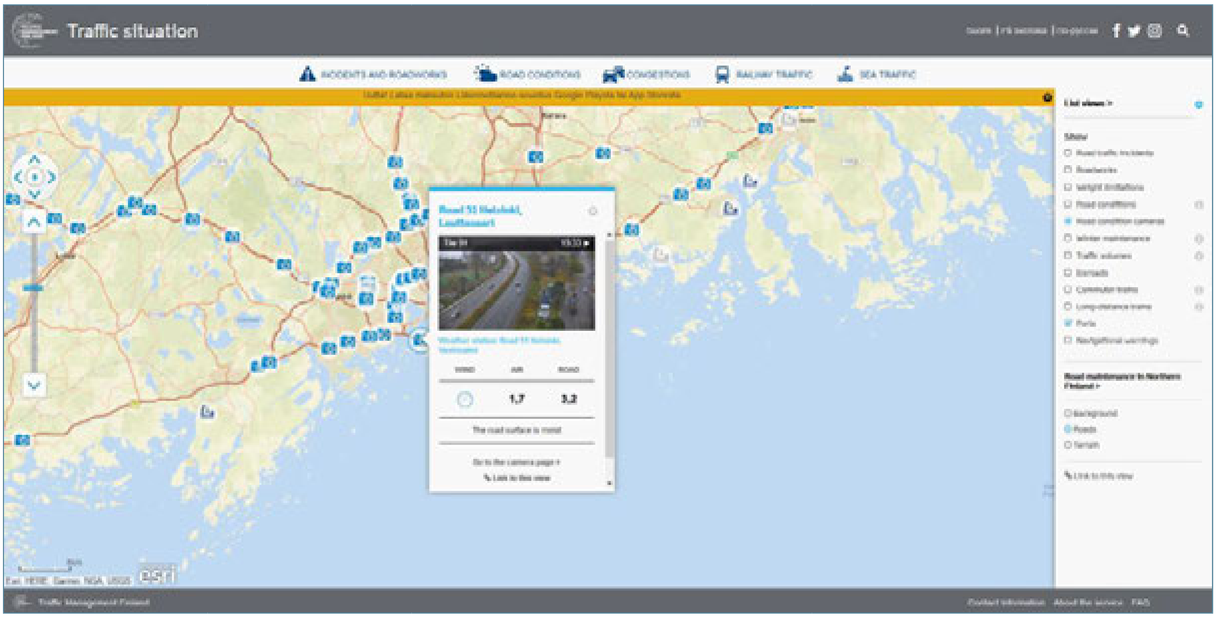
ITS SERVICE DESCRIPTION	
General Objectives	☐ Reduction of congestion ☒ Increase of safety ☐ Reduction of environmental damage ☐ Protection of the road infrastructure ☐ Increase traveller comfort ☒ Other

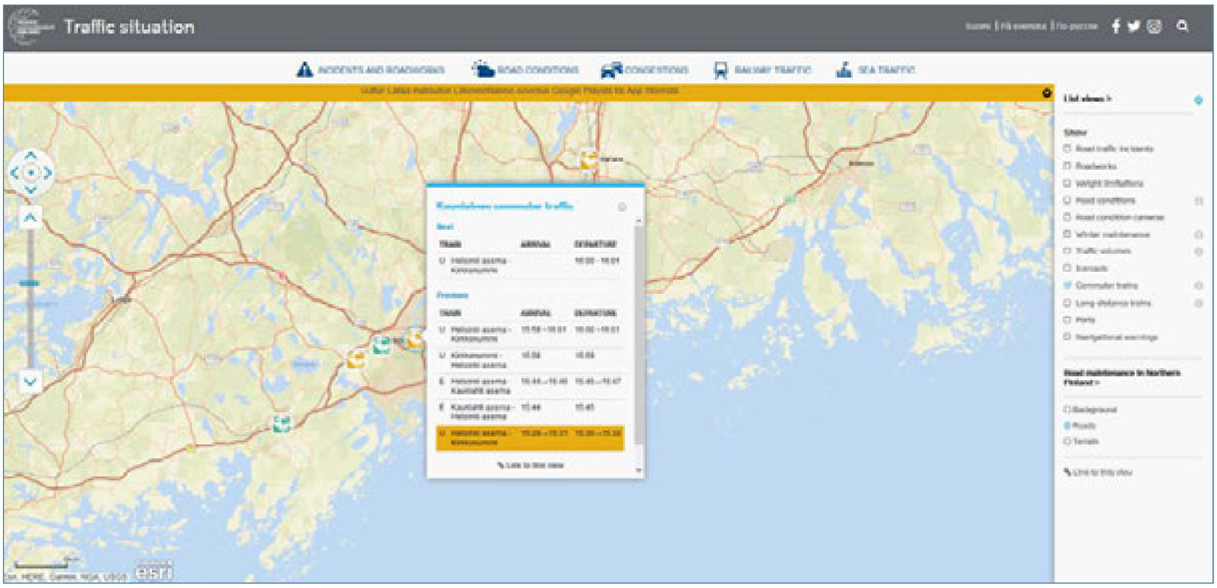
Specific Objectives	☐ Change the distribution in time of transport in order to achieve a more even allocation, avoiding peaks (access restrictions, fees) ☐ Change the distribution of transport in space in order to achieve a more even distribution on the network, and prevent "wrong vehicles on wrong places" (traffic control, traffic management, traffic information, access restrictions) ☐ Change the composition of vehicles on a certain piece of infrastructure (access restrictions, fees) ☐ Manage the flow on a given road section in order to reduce speed variation and thus improve the capacity and reduce the risk of incidents ☐ Manage access to a given road section in order to prevent disturbances and reduce the risk of incidents (e.g. ramp metering) ☐ Increase the speed on the link and thus increase capacity (throughput) ☒ Reduce the risk of incidents and traffic disruptions through better informed infrastructure users (traffic and traveller information) ☐ Reduce the consequences from disruptions through fast countermeasures (incident response time) ☐ Reduce traffic volumes through redistributing transport between transport modes ☐ Other
Short narrative description of your best practice including e.g. geographical dimension, numbers, target group like HGV or passengers, costs etc.	One website and mobile app show traffic status (road transport, commuter trains, long-distance trains), incidents, roadworks, road weather condition, warnings, etc. for the whole country
Relation with national access point set up according to EC Delegated Regulations	☐ Provide information to the national access point ☒ Receive information from the national access point ☐ No connection to the national access point
Information provision to end users	☒ Web portal ☒ Phone app ☐ VMS ☐ In-vehicle information ☐ Other: Radio

IMPLEMENTATION ASPECTS	
Year of implementation (+ end date of measure if applicable)	2014 (publication of website service) 2019 (publication of mobile app)
Technical description	The traffic situation service is operated by the state-owned company Traffic Management Finland Group (TMFG). In the service all real-time data considering road traffic is presented on the same map, allowing the user to choose the content: incidents, roadworks, weight limitations, current and predicted road weather, traffic volumes, winter maintenance situation, iceroads and road weather camera pictures. In addition to that, also information on train traffic delays and maritime transport are available, to allow the planning of the multimodal trip chains. The data provided by the service is collected by TMFG, Finnish Transport Infrastructure Agency (FTIA) and Finnish Transport and Communications Agency (Traficom). The service design goals were improved zoomable maps, visual and functional clarity, user tailored content and high technical performance. The service is designed so that it can be accessed with mobile devices with high quality user experience. The service uses the gps-location of the mobile device to present the information close to the user, and the user interface scales down to different display sizes automatically. A mobile app for Android and iOS is also currently available. The mobile version offers the same information and functions as the website.
Lessons learnt / factor of success / topics considered as good practice (technical, legal, organisational, financial)	The service was built using agile software development methods, that reduced the development time considerably. The use of cloud service instead of traditional databases made it easy to manage and upkeep the service. This meant cost-efficiency for the Finnish Transport Agency. The service is also easily and flexibly expanded to include new data sources. Because of the chosen technologies, the service is also highly scalable, being able to serve even 1 million daily users during the days of severe winter storms.
Impacts assessment / results (if available)	-

ILLUSTRATIONS







REFERENCES	
Documentation available on the project	https://tmfg.fi/fi/tmfg/liikennetilanne-palvelu (in Finnish)
Web link	https://liikennetilanne.tmfg.fi/

1.1.2.12 TrafficGuide

GENERAL INFORMATION	
Name of service/system/project	TrafficGuide
Name of operator/organisation	ELECTRONIC SOLUTIONS SRL
Service delivery	☐ Public ☒ Private
Mainly applicable Deployment Guideline	TIS-DG03-05
Other relevant Deployment Guideline(s)	No other relevant DGs
Contact for more information	sorin.dumitrescu@elsol.ro

GEOGRAPHICAL ASPECTS	
Country	Romania (RO)
Region of implementation	Romania
Corridor(s) or Network(s) concerned	CROCODILE; Traffic Guide covers the entire Romanian motorways and national roads network.

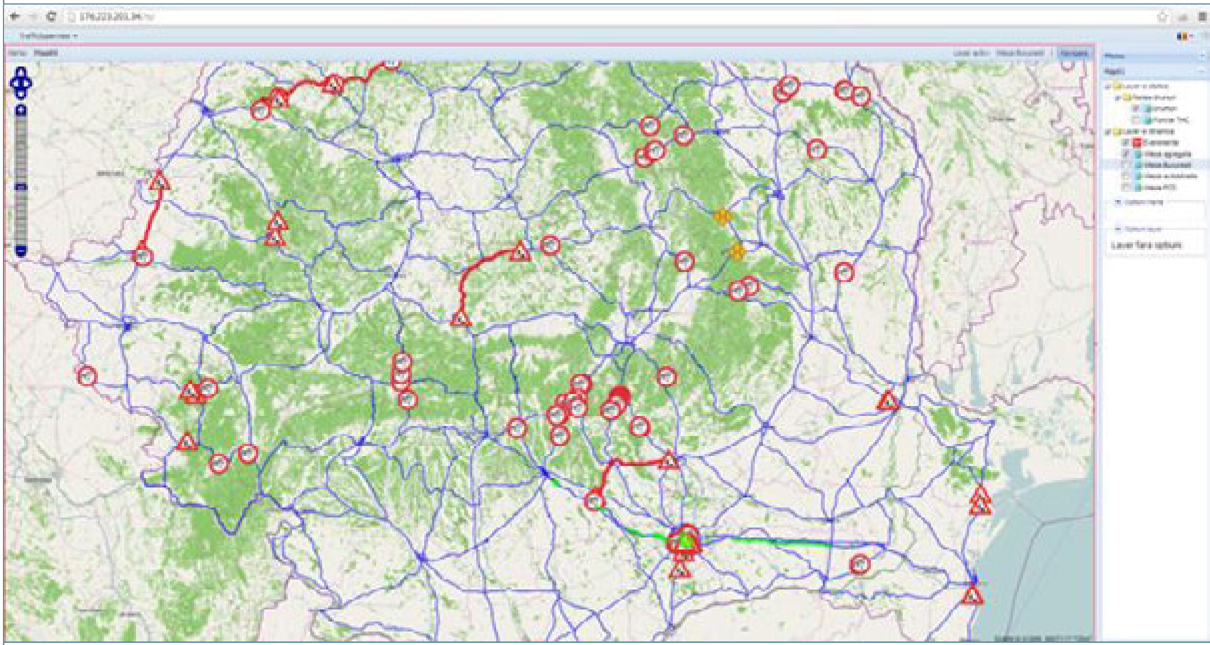
ITS SERVICE DESCRIPTION	
General Objectives	☒ Reduction of congestion ☒ Increase of safety ☐ Reduction of environmental damage ☐ Protection of the road infrastructure ☒ Increase traveller comfort ☐ Other

Specific Objectives	☒ Change the distribution in time of transport in order to achieve a more even allocation, avoiding peaks (access restrictions, fees) ☒ Change the distribution of transport in space in order to achieve a more even distribution on the network, and prevent "wrong vehicles on wrong places" (traffic control, traffic management, traffic information, access restrictions) ☐ Change the composition of vehicles on a certain piece of infrastructure (access restrictions, fees) ☐ Manage the flow on a given road section in order to reduce speed variation and thus improve the capacity and reduce the risk of incidents ☐ Manage access to a given road section in order to prevent disturbances and reduce the risk of incidents (e.g. ramp metering) ☐ Increase the speed on the link and thus increase capacity (throughput) ☒ Reduce the risk of incidents and traffic disruptions through better informed infrastructure users (traffic and traveller information) ☐ Reduce the consequences from disruptions through fast countermeasures (incident response time) ☐ Reduce traffic volumes through redistributing transport between transport modes ☐ Other
Short narrative description of your best practice including e.g. geographical dimension, numbers, target group like HGV or passengers, costs etc.	TrafficGuide is a Traffic Information System for interurban road and Motorways in Romania and Bucharest City arterials. TrafficGuide project is developed by Electronic Solutions in partnership with Romanian authorities. The system gathers traffic data from all available sources: incidents, road works, traffic flow data from sensors. These are fused and enhanced with flow data from Floating Car Data and Bluetooth probe data providers and distributed using different channels. The traffic information is provided using a Web Portal. The traffic data can be exported to other systems using standard DATEX II protocol.
Relation with national access point set up according to EC Delegated Regulations	☐ Provide information to the national access point ☐ Receive information from the national access point ☒ No connection to the national access point
Information provision to end users	☒ Web portal ☐ Phone app ☐ VMS ☐ In-vehicle information ☐ Other

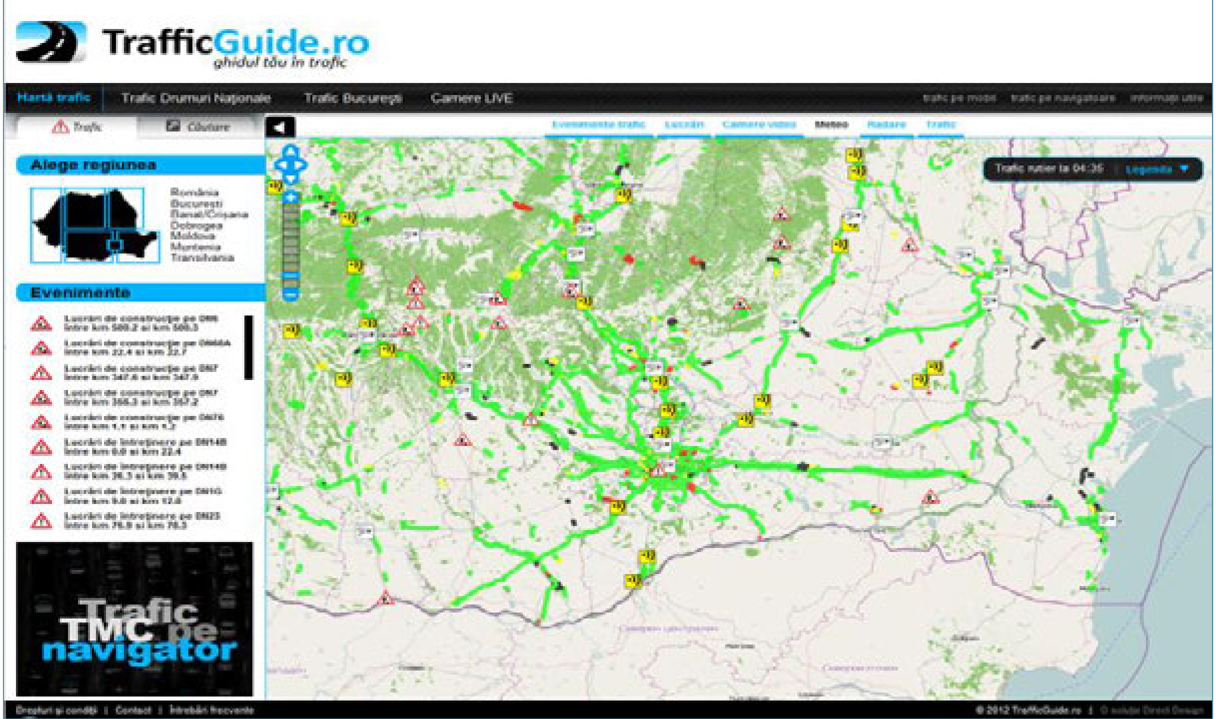
IMPLEMENTATION ASPECTS	
Year of implementation (+ end date of measure if applicable)	2007 (2013)
Technical description	The system is able to create, receive, process, edit and publish various kinds of traffic information (such as traffic flow status, accidents, and weather conditions) in a variety of different formats. Real-time FCD trajectories, Detector Counts, Traffic States and Traffic Events are collected from the Client's real-time traffic system in the form of: speed, flow and occupancy measurements from Detectors on links, FCD Trajectories from probe vehicles, DATEX messages representing events and traffic flow data, manual input of events from an operator interface. Then, all this data are separately translated into observed partial traffic states; specifically, the FCD Map Matching and Aggregation module matches trajectories to the reference network producing average link speeds. All the functionality of administration, user authentication and monitoring are exposed via http web services too. All information comes from official sources such as the National Company of Motorways and National Roads, Infotrafic or Bucharest Traffic Management. The information from Infotrafic can appear at any time of the day via mail. The traffic information can be introduced manually, but the event has possibility to expire automatically from interface, because when the information is introduced has a mandatory insertion field about start and end date. The messages from the National Company of Motorways and National Roads are received via mail and can be processed automatically. The web Portal is also displaying traffic video camera feeds. All the information is displayed both in a textual view, and on a map with graphical icons.

Lessons learnt / factor of success / topics considered as good practice (technical, legal, organisational, financial)	Having various sources of information with different georeferencing methods proved to be a challenge to integrate and display correctly on a digital map. One of the most difficult aspects was to convert from linear georeferencing to LAT LON geographical coordinates.
Impacts assessment / results (if available)	

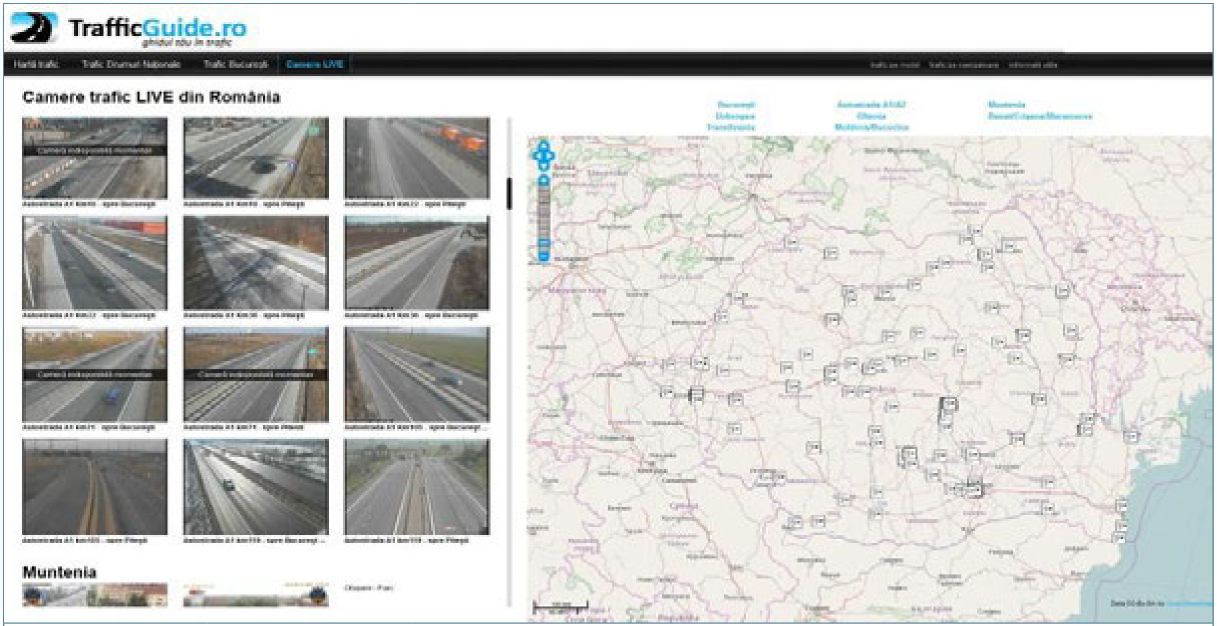
ILLUSTRATIONS



Edit / add interface for the operator



Real time information on web map



Traffic video cameras

REFERENCES	
Documentation available on the project	
Web link	http://trafficguide.ro

1.1.2.13 Travel time calculation using Bluetooth sensors

GENERAL INFORMATION	
Name of service/system/project	Travel time calculation using bleu tooth sensors
Name of operator/organisation	SANEF Group
Service delivery	☒ Public ☐ Private
Mainly applicable Deployment Guideline	TIS-DG03 Traffic Condition and Travel Time Information Service
Other relevant Deployment Guideline(s)	TIS-DG02 Forecast and Real Time Event Information
Contact for more information	Frank Rivey, SANEF Group SANEF/SAPN, Echangeurs des Essarts, 76530 Grand Couronne, France Tel: +33 2 35 18 39 76 f.rivey@sapn.fr

GEOGRAPHICAL ASPECTS	
Country	France
Region of implementation	North of France
Corridor(s) or Network(s) concerned	Arc Atlantique

ITS SERVICE DESCRIPTION	
General Objectives	☐ Reduction of congestion ☒ Increase of safety ☐ Reduction of environmental damage ☐ Protection of the road infrastructure ☒ Increase traveller comfort ☐ Other
Specific Objectives	☐ Change the distribution in time of transport in order to achieve a more even allocation, avoiding peaks (access restrictions, fees) ☐ Change the distribution of transport in space in order to achieve a more even distribution on the network, and prevent "wrong vehicles on wrong places" (traffic control, traffic management, traffic information, access restrictions) ☐ Change the composition of vehicles on a certain piece of infrastructure (access restrictions, fees) ☐ Manage the flow on a given road section in order to reduce speed variation and thus improve the capacity and reduce the risk of incidents ☐ Manage access to a given road section in order to prevent disturbances and reduce the risk of incidents (e.g. ramp metering) ☐ Increase the speed on the link and thus increase capacity (throughput) ☒ Reduce the risk of incidents and traffic disruptions through better informed infrastructure users (traffic and traveller information) ☐ Reduce the consequences from disruptions through fast countermeasures (incident response time) ☐ Reduce traffic volumes through redistributing transport between transport modes ☐ Other
Short narrative description of your best practice including e.g. geographical dimension, numbers, target group like HGV or passengers, costs etc.	Travel time calculation has been carried out since 2004 on the SANEF network and is done on about 350km of motorways. The travel time calculation method used up to now was based on electromagnetic loops measurements. In 2011, SANEF made a study on the new technologies available regarding travel time calculation in order to evaluate and identify other easy, efficient and cost-effective calculation methods. Following this study, SANEF decided to deploy, early 2012, travel time calculation using Bluetooth sensors on the A1 and A2 motorways in the north of France.
Relation with national access point set up according to EC Delegated Regulations	☒ Provide information to the national access point ☐ Receive information from the national access point ☐ No connection to the national access point
Information provision to end users	☒ Web portal ☒ Phone app ☒ VMS ☐ In-vehicle information ☐ Other

IMPLEMENTATION ASPECTS	
Year of implementation (+ end date of measure if applicable)	▪ Launched in 2012 ▪ Operational in 2012
Technical description	25 Bluetooth sensors were thus installed from September 2011 to January 2012, on the A1 and A2 motorways: ▪ 21 sensors on the A1 ▪ 4 sensors on the A2Inter-distance between each sensor: 5 to 10 km (depending on the traffic flow) ▪ Higher density at the North and South end of the A1 motorway ▪ Time for data recovery: 1 minute. The Bluetooth acquisition chain is depicted below: 1. The BT (Bluetooth) sensors are installed every 10 km on the roadside. 2. They catch the passing vehicles Mac address at point A. 3. At point B, another sensor catches the same Mac address. 4. By knowing the distance and the time it takes to travel from A to B, one can calculate the travel time. This is done in the server called 'Frontal d'acquisition' here below. 5. This principle is applied all along the motorway enabling calculation of travel time anywhere on the motorway. This is done in the server called 'Temps de parcours'. This last server publishes the calculated travel times to any client who is interested in having information like VMS, SANEF's traffic radio, Web pages or time-space charts used for traffic monitoring

Lessons learnt / factor of success / topics considered as good practice (technical, legal, organisational, financial)	The BT (Bluetooth) sensors were installed during the 2012 spring period. After installation, a 6-month period was necessary to adjust the travel calculation algorithm in order to adjust calculation during some specific traffic events. Since then, travel time calculation has proved to be very responsive, accurate and reliable. The Bluetooth system has proved to be very accurate and competitive: ▪ Best cost / travel time accuracy ratio ▪ Easy to implement ▪ Self-sufficient in energy and communication. With a good accuracy regarding travel times: ▪ High reactivity of the system ▪ Based on average travel times. The Bluetooth system allows different applications: ▪ Travel time calculation ▪ Crossing time (Tolls, Works) ▪ Matrix Origin/ Destination Thanks to this experimentation, SANEF's travel time calculation platform was updated, and is now able to integrate and merge the 3 types of measures (BT, loops, ANPR). SANEF consider the Bluetooth system as being the best in class system for travel time calculation with the lowest deployment cost. This system can work anywhere in Europe, where cars are well equipped with Bluetooth transmitters and could be deployed along corridors to provide a seamless information for long haul travellers.
Impacts assessment / results (if available)	During this 6-month period SANEF measured the number of BT transmitters seen at a specific location and compared it to the traffic flow. The measure shows that 15% of traffic is equipped with at least one BT transmitter. This means that the BT system can catch 15% of vehicle speed on the motorway which is enough to calculate a good travel time and allow the algorithm to eliminate outliers data for those people who may stop at rest areas (see figure 2 with traffic flow in red and number of BT detection in blue). The accuracy of the BT measurement was confirmed by a direct comparison with an ANPR system which provides travel time using license plate reading. The two measurements have proved to be exactly the same (see second picture below with BT travel time in blue and ANPR travel time in red). As conclusion, The system is now fully operational and able to deliver continuous travel time to users. Consequently, that system has been also deployed on the whole A13 motorway (220 Km) and on the western part of A4 (approaching Paris: 22 km). In total, Sanef has more than 600km of motorway equipped with BT sensors.

ILLUSTRATIONS

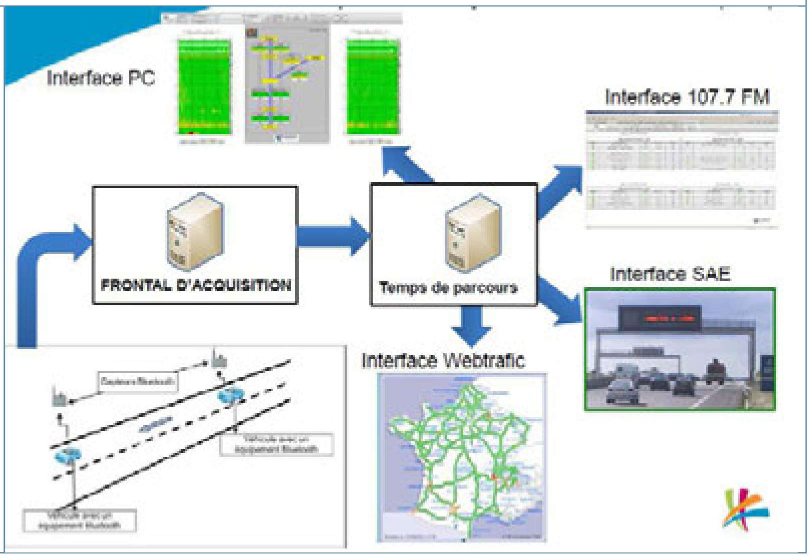
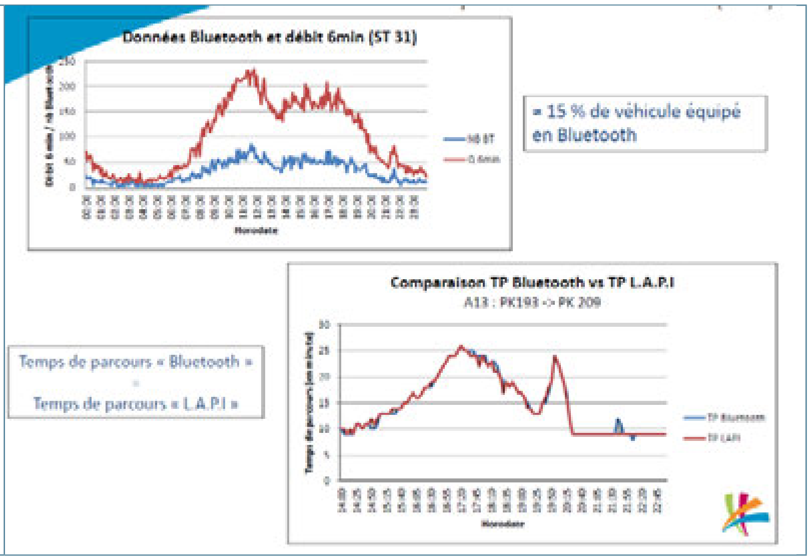


Figure 1: The Bluetooth system and its interfaces

Figure 2: travel time comparison between bluetooth and licence plate reading	

REFERENCES	
Documentation available on the project	
Web link	

1.1.3 TTIS-03 Speed Limit Information

1.1.3.1 Average speed control on toll motorways in Italy (Tutor)

GENERAL INFORMATION	
Name of service/system/project	Average speed control on toll motorways in Italy (Tutor)
Name of operator/organisation	Autostrade per l'Italia
Service delivery	☐ Public ☒ Private
Mainly applicable Deployment Guideline	TIS-DG04
Other relevant Deployment Guideline(s)	
Contact for more information	pietro.fabbri@autostrade.it ftrallori@autostrade.it

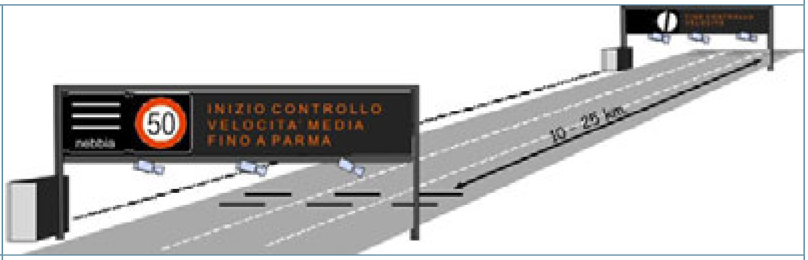
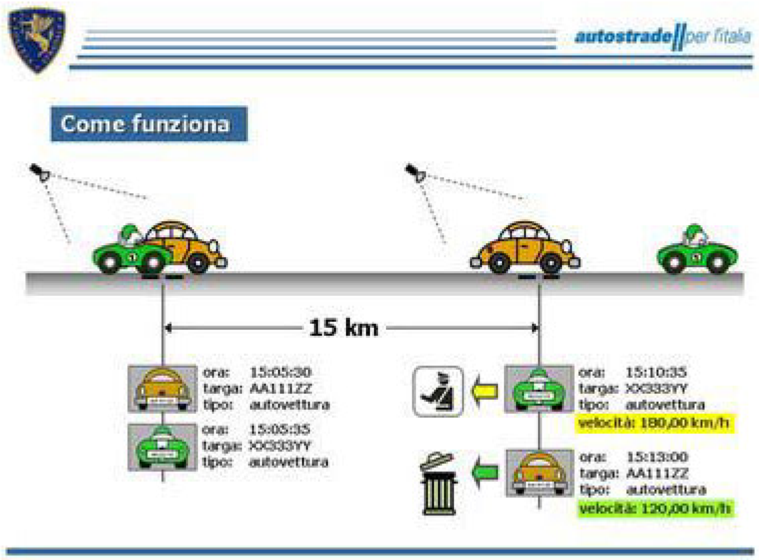
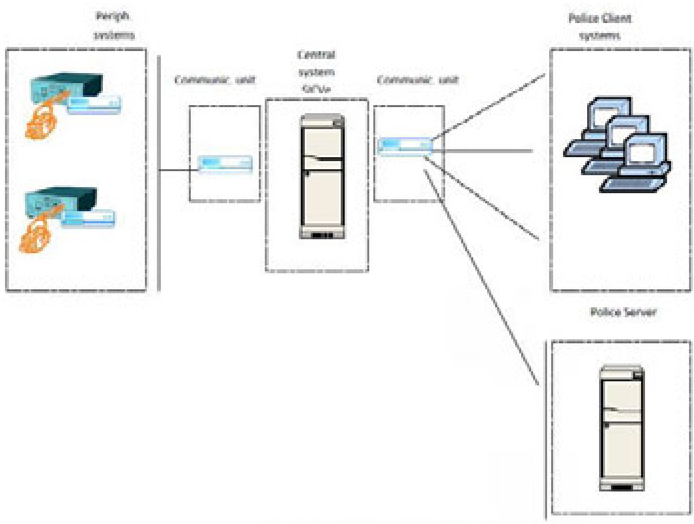
GEOGRAPHICAL ASPECTS	
Country	Italy
Region of implementation	ASPI motorway network
Corridor(s) or Network(s) concerned	2494 km of Italian Trans European network

ITS SERVICE DESCRIPTION	
General Objectives	☐ Reduction of congestion ☒ Increase of safety ☐ Reduction of environmental damage ☐ Protection of the road infrastructure ☐ Increase traveller comfort ☐ Other

Specific Objectives	☐ Change the distribution in time of transport in order to achieve a more even allocation, avoiding peaks (access restrictions, fees) ☐ Change the distribution of transport in space in order to achieve a more even distribution on the network, and prevent "wrong vehicles on wrong places" (traffic control, traffic management, traffic information, access restrictions) ☐ Change the composition of vehicles on a certain piece of infrastructure (access restrictions, fees) ☒ Manage the flow on a given road section in order to reduce speed variation and thus improve the capacity and reduce the risk of incidents ☐ Manage access to a given road section in order to prevent disturbances and reduce the risk of incidents (e.g. ramp metering) ☐ Increase the speed on the link and thus increase capacity (throughput) ☐ Reduce the risk of incidents and traffic disruptions through better informed infrastructure users (traffic and traveller information) ☐ Reduce the consequences from disruptions through fast countermeasures (incident response time) ☐ Reduce traffic volumes through redistributing transport between transport modes ☐ Other
Short narrative description of your best practice including e.g. geographical dimension, numbers, target group like HGV or passengers, costs etc.	The average speed control system based on the use of the so-called "Tutor" is aimed at an enforcement centred on plate number recognition: this can be obtained when two, or more, video cameras are installed at a given distance; matching the plate numbers of vehicles, automatically recorded by the cameras, it allows to know their average speed in a given stretch of motorway given by measuring the time passed. The plate numbers of all vehicles which have kept an average speed compliant with the allowed speed on the considered motorway stretch are immediately deleted from the software buffer. Inductive loops or radar detectors are placed close to VMS and tunnel entrance, notifying or reminding the speed limit to drivers and the beginning of the controlled area. The use of inductive loops and radar detectors is only related to the activation of the video cameras, so in order to avoid their use (energy savings) when no vehicles are running. The purpose of the system is to increase the safety level on the road network, through the respect of speed limits. In order to have a precise time reference, the system is constantly aligned with GPS system. The system detects directly road offences through images elaboration and uses digital technologies for video data transmission. The system uses two cameras, or more: a context camera, detecting and documenting offences through movies, and a plate camera, collecting offending vehicle's plate images. Cameras are digital and not interleaved, therefore providing the best possible quality of both context and plate images. The average speed violations control is executed on the base of a reference grid set up by the authorized operators in the headquarter, where speed limits for any vehicles' class are defined. A second process has to analyse the picture in order to automatically decode the plate number and make it available for following elaborations. Considering the accuracy in time alignment of the detection systems and the precision in measuring the distance, in such operational modality the system capacity to work in automatic way is connected to the system's capacity in reading plates between two points delimiting the stretch under observation. In fact such functioning modality is strictly connected to the plate and to the crossing instant. In order to have the best performance, plates not read automatically by the system are subsequently analysed through an OCR with higher recognition power or manually, by an operator. Such last intervention is quite onerous since it has to be executed on all transits and not only on those in offence described in the previous case. The probability to correctly identify vehicles on a stretch under observation is about 90% of total transits.
Relation with national access point set up according to EC Delegated Regulations	☐ Provide information to the national access point ☐ Receive information from the national access point ☒ No connection to the national access point
Information provision to end users	☒ Web portal ☒ Phone app ☒ VMS ☐ In-vehicle information ☐ Other

IMPLEMENTATION ASPECTS	
Year of implementation (+ end date of measure if applicable)	2005
Technical description	The Tutor system allows controlling long motorway sections using the various instalments present in series. The flexibility of the system allows also modifying the motorway section monitored by coupling different instalment data. The systems, named "Tutor" as above mentioned, operates this way: at the first video camera instalments, all the vehicles passages, using the inductive loops or radar detectors for the activation of the video cameras, are recorded with the automatic plate detection. At the end of the section which is being monitored, usually at a distance comprised between 10 and 25 km, the second instalment records again all the vehicles. The average speed maintained by the driver is calculated in real time. If the result is lower than the speed limit on that motorway section or stretch, the data are deleted; otherwise, the images of the two passages are made available for the Road Police Operator for the necessary procedures of automatic fine ticketing. During homologation procedures made by the competent Italian Ministry, as done for all the speed detectors, it has been decided to apply a 5% margin reduction in the speed detected (with a minimum of km/h) in order to aid the users. The Tutor System uses advanced technology: it works with any weather and light conditions (at night, with rain, with fog up to 30/40 m of visibility). In order to guarantee the security of data, all information collected is elaborated by cryptography and electronic signature systems, guaranteeing privacy, integrity and source. Furthermore, data not concurring to the notification of an offence is automatically cancelled by the system, in full respect of privacy according to the existing laws. The control system has innovative functionalities when compared with the traditional methodologies in use; among these: ▪ monitoring capacity on the entire road section with similar effectiveness on all transit lanes (1,2, 3 lanes); ▪ direct detection through the sensors in the road surface in the 90% of the times or indirect detection (through consultation of public registers) of the vehicle class in relation to the different speed limits established by the art. 142 of the Italian Road Code; ▪ average speed detection on long motorway stretches, more functional for drivers' behaviour measurement than instantaneous speed (this one can sometimes be influenced by driver's conscious choices justified by safety reasons); ▪ automatic attribution of offences to the vehicles' categories expressly indicated at letters e), f),g), h) i) of art. 142, co. 3 of the Italian Road Code. The average speed determination is made by: ▪ dislocating, on the motorway stretch to be controlled, a series of traffic detection stations, composed by a sensor below the road surface (magnetic loop) or radar detectors (above ground) and one detection unit per transit lane; ▪ measuring intermediate distances between two detection stations (A and B) taking into account the shortest route (more advantageous for users); ▪ detection of all traffic passing on station A; ▪ detection of all traffic passing on the following station B; ▪ matching the plates number detected in both stations with the related timestamp; ▪ collecting from the peripheral devices the images of vehicles in transit in order to verify the offence. Images and all data relating non-offending vehicles are deleted within the terms stated by the existing national law. Such functionalities allow eluding a priori any significant instrumental error in speed calculation (based only on distance and time measured). Such a requirement makes the system respectful of the Italian Law. As above mentioned, average speed calculation depends on the reliability of the plate's recognition process. The recognizer system (PLATES) is already used by other specialized products of Autostrade per l'Italia to control the access to limited traffic areas and for the Telepass systems. The sw was assessed in accordance with UNI 10772 standard in March 2001 by the University of Siena (the technical report IRITI-TI 2001.08 describing the executed trials is available) and certified by IEN Galileo Ferraris in March 2004.

	The "Plates" system is able to identify and recognise a plate in an image with accuracy usually more than 95%. Such precision is reached by analyzing images with the same OCR software used first on the URV and then on the UEL. The second attempt - aimed at recovering plates that the OCR software cannot read on the camera – lower the percentage of unrecognized plates of about 3-4%. Plates unrecognized are directly sent to the central system that tries the reading using further OCR sw (eventually for foreign plates) in automatic mode and/or to make them available to operators for the plate manual process. Thanks to such technique, it is possible to raise a 95% recognition capacity. The main parameters that could interfere with the plate's recognition are the physical conditions (characters aspect, character reflections, installation, etc.); for this reason the probability that a plate is read by both the systems is very high. The images containing unrecognised plates can be treated automatically by an OCR sw or treated manually within the stated time limits. The error in recognition of plates is due essentially to two possible reasons: ▪ error in detection the plate (it affects the 98% of cases); it means the plate is not recognized globally in the vehicle's image; ▪ error in recognizing the single characters (it affects less than 2% of cases); it entails a wrong recognition. It is therefore an automated system for the recognition of the plate number that is usually placed closed to variable message panels placed along toll motorways in Italy; the system can read the plate at the first passage. After a number of km, e.g. 15 km, a second instrument can read again the plate number and therefore the average speed of the vehicle is calculated on the basis of the existing distance among the two panels and the time requested for covering the space. Even traffic crossing the lanes can be detected by two systems contemporarily. Such situation is recognized by the peripheral detection system that verifies the covering of sensors installed in the road surface by filtering the image without plate. The peripheral system also can be set up to save both the images, associating them logically so as to present them to the operator. The disposition or layout of sensors permits to detect all the traffic. Anyway a minimum part could be missed tricking the system in the area astride the lanes through an "S-turn" that – considering the little space available – would be possible only at very low speed.
Lessons learnt / factor of success / topics considered as good practice (technical, legal, organisational, financial)	Test sites The Tutor System has been activated in 2005 on the "Autostrade per l'Italia" (ASPI) motorway sections. Until 2016 it has been installed on 2.494 km, meaning about 40% of the ASPI network. Approximately 60% of the fatal accidents is caused or sensibly aggravated by high speed driving. The Tutor System allows detecting, in any weather condition, the average speed of all the vehicles which drive on a particular motorway section. The project was developed with a synergy between ASPI and the Italian Road Police and its main purpose is not to punish the occasional speed limit transgression, but the continuous behaviour of drivers who constantly and averagely maintain a speed which is beyond the legal limits. The Tutor System has the objective of preventing speed limits violations, so all the installations are signalled before with the necessary panels and the whole map of the Tutor System can be seen on the websites www.poliziadistato.it and www.autostrade.it. As mentioned, the system in average speed is usable on condition that detection systems are installed at a distance compatible with the efficiency. The recommended distance is not lower than 1km, while a maximum limit does not exist, depending on the road typology. On the motorway sections where the system has been active for more than 1 year, it has been monitored a 50% decrease in mortality, 20% decrease in incidents and 27% reduction in incidents with injured people (Autostrade per l'Italia).
Impacts assessment / results (if available)	The system is related to the respect of average speed limits, with the aim of evaluating vehicle speed along toll motorways in Italy. Road safety: ▪ where implemented reduction of 51% of mortality rate ▪ where implemented reduction of 27% of accident with injured rate ▪ where implemented reduction of 19% of accidentality rate

ILLUSTRATIONS	
	
	
Generic architecture of the Tutor system	

REFERENCES	
Documentation available on the project	
Web link	Web portal: www.autostrade.it, www.poliziadistato.it Phone App: MyWay – Autostrade per l'Italia

1.1.3.2 Monitoring Centers

GENERAL INFORMATION	
Name of service/system/project	Monitoring Centers
Name of operator/organisation	NATIONAL COMPANY FOR ROADS INFRASTRUCTURE ADMINISTRATION
Service delivery	☒ Public ☐ Private
Mainly applicable Deployment Guideline	TIS-DG04 SPEED LIMIT
Other relevant Deployment Guideline(s)	TIS-DG03-05 Traffic Condition and Travel Time Information TIS-DG06 Weather Information
Contact for more information	carmen.petrisor@andnet.ro

GEOGRAPHICAL ASPECTS	
Country	Romania (RO)
Region of implementation	Romania
Corridor(s) or Network(s) concerned	Crocodile 2; A1 Nadlac (border) to Arad, Orastie – Sibiu the 4th section and Pitesti – Bucharest; A2 Bucharest - Constanta

ITS SERVICE DESCRIPTION	
General Objectives	☒ Reduction of congestion ☒ Increase of safety ☐ Reduction of environmental damage ☐ Protection of the road infrastructure ☐ Increase traveller comfort ☐ Other
Specific Objectives	☐ Change the distribution in time of transport in order to achieve a more even allocation, avoiding peaks (access restrictions, fees) ☐ Change the distribution of transport in space in order to achieve a more even distribution on the network, and prevent "wrong vehicles on wrong places" (traffic control, traffic management, traffic information, access restrictions) ☐ Change the composition of vehicles on a certain piece of infrastructure (access restrictions, fees) ☒ Manage the flow on a given road section in order to reduce speed variation and thus improve the capacity and reduce the risk of incidents ☐ Manage access to a given road section in order to prevent disturbances and reduce the risk of incidents (e.g. ramp metering) ☐ Increase the speed on the link and thus increase capacity (throughput) ☐ Reduce the risk of incidents and traffic disruptions through better informed infrastructure users (traffic and traveller information) ☒ Reduce the consequences from disruptions through fast countermeasures (incident response time) ☐ Reduce traffic volumes through redistributing transport between transport modes ☐ Other

Short narrative description of your best practice including e.g. geographical dimension, numbers, target group like HGV or passengers, costs etc.	Apart from the 'traditional' fixed metal road signs for speed limit according the law, in Romania, the speed limit information can be provided on the Variable Message Signs (VMS), but only for event like on-going road works, congestion (heavy traffic), slippery road, snow, fog or pollution, e.g. Information about speed limits plays an important role in increasing safety on roads as it contributes to the reduction of incidents caused by drivers failing to observe the relevant limits. The VMS shows the speed limit and/or a warning pictogram together with advice on speed reduction. For the present the NCRIA is the only provider of the speed limit information provided by ITS systems. VMSs which are guidance systems are installed on the highway and are operated by NCRIA. The systems consist of VMS or dynamic signage with predefined content. The information that could appear on the VMS warns about events that require speed reduction. The service is used only as a on-trip service.
Relation with national access point set up according to EC Delegated Regulations	☐ Provide information to the national access point ☐ Receive information from the national access point ☒ No connection to the national access point
Information provision to end users	☐ Web portal ☐ Phone app ☒ VMS ☐ In-vehicle information ☐ Other

IMPLEMENTATION ASPECTS	
Year of implementation (+ end date of measure if applicable)	2011 (2012) for A2 Bucharest – Constanta 2012 (2014) for A1 highway sectors
Technical description	For each sector of the highway there is a Monitoring and Information Center, where the information regarding events that need speed limit (e.g. on-going road works, congestion/heavy traffic, slippery road, snow, fog or pollution) is provided. One Monitoring and Information Center monitors some of the highway's sectors which are connected to it. The highways, the ITS system and the Monitoring and Information Centers are in the administration of NATIONAL COMPANY FOR ROADS INFRASTRUCTURE ADMINISTRATION (NCRIA). At some of the Monitoring and Information Centers the operator's work schedule covers 24 hours from 24 and NCRIA intends to be the same in all the centres. The operators who work in the Monitoring and Information Center where this system is connected to agreed the message and the location of the VMS (which will be load on the VMS) with the Traffic Police representative based on the "Plan of measures on the setting and display of variable messages on highways" - document signed by the both parties. The operator from the Monitoring and Information Center is the person who sent the message to the VMS in order to quickly inform the motor vehicle drivers about the respectively event. The messages on the VMS have a pictogram on the left side showing a sign representative for the event and in the right side, the advancing message. All text is provided in Romanian language. Generally in the message it is mentioned the event which lead to the neccesity of the messages disemination, the position where the warning is available and the advice that the motor vehicle drivers must take into account.
Lessons learnt / factor of success / topics considered as good practice (technical, legal, organisational, financial)	Cooperation with external partners based on the Action Plan or Protocol signed between NCRIA and these (i.e. the Romanian Traffic Police, the National Meteorological Administration) is a key when providing information regarding events that need speed limit (e.g. on-going road works, congestion/heavy traffic, slippery road, snow, fog or pollution). The operators from Monitoring and Information Centre monitor all these kind of events. Please note that in each Monitoring and Information Centre there is an office of the Romanian Traffic Police, the operator agrees with the traffic police representative before loading of each messages on the VMS.
Impacts assessment / results (if available)	Continuous increasing of demanding information leads us to a good experience gained with each additional kilometer of highway implemented. It is very important for the operator from Monitoring and Information Centres to have early information regarding specific speed limit event. Based on this information, measures can be taken in advance so as to avoid traffic congestions and/or the occurrence of various unwelcome/unforeseen events.

ILLUSTRATIONS

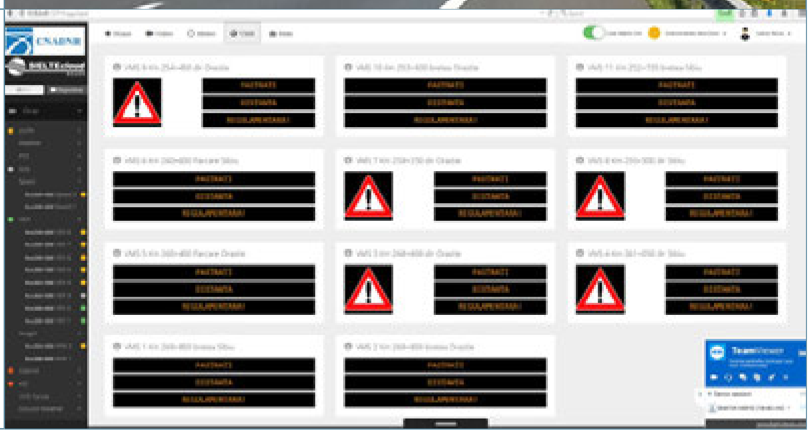
Example of messages on VMS for on-going road works on km ...
Info: “Lane 1 closed”
Advice “Speed Reduced Ahead”

Example of messages on VMS for reduce the speed ahead
Kilometer position
Cause: “Danger of skidding”

Example of message on VMS for speed limit of 130 km/hour on highway “Pay attention, RADAR”

Example of messages on VMS for on-going road works

Example of monitoring the VMS messages by the operators



REFERENCES	
Documentation available on the project	-
Web link	-

1.1.3.3 Speed limit information services based on local traffic regulations

GENERAL INFORMATION	
Name of service/system/project	Speed limit information services based on local traffic regulations.
Name of operator/organisation	Swedish Transport Administration
Service delivery	☒ Public ☐ Private
Mainly applicable Deployment Guideline	DG04 Speed limit Information
Other relevant Deployment Guideline(s)	
Contact for more information	Eva Boethius: eva.boethius@trafikverket.se

GEOGRAPHICAL ASPECTS	
Country	Sweden
Region of implementation	Sweden
Corridor(s) or Network(s) concerned	All road networks

ITS SERVICE DESCRIPTION	
General Objectives	☒ Reduction of congestion ☒ Increase of safety ☒ Reduction of environmental damage ☐ Protection of the road infrastructure ☐ Increase traveller comfort ☒ Other: To modernise the handling of traffic regulations, make it easier to find regulations and improve the rule of law. To be able to offer machine interpretable regulations with the position connected to the road-network.
Specific Objectives	☐ Change the distribution in time of transport in order to achieve a more even allocation, avoiding peaks (access restrictions, fees) ☐ Change the distribution of transport in space in order to achieve a more even distribution on the network, and prevent "wrong vehicles on wrong places" (traffic control, traffic management, traffic information, access restrictions) ☐ Change the composition of vehicles on a certain piece of infrastructure (access restrictions, fees) ☐ Manage the flow on a given road section in order to reduce speed variation and thus improve the capacity and reduce the risk of incidents ☐ Manage access to a given road section in order to prevent disturbances and reduce the risk of incidents (e.g. ramp metering) ☐ Increase the speed on the link and thus increase capacity (throughput) ☐ Reduce the risk of incidents and traffic disruptions through better informed infrastructure users (traffic and traveller information) ☐ Reduce the consequences from disruptions through fast countermeasures (incident response time) ☐ Reduce traffic volumes through redistributing transport between transport modes ☐ Other

Short narrative description of your best practice including e.g. geographical dimension, numbers, target group like HGV or passengers, costs etc.	Government authorities and municipalities deciding on certain traffic regulations (e.g. speed limits) are obliged to publish the regulations on a dedicated website, operated by the Swedish Transport Agency. The interpreted and road net positioned traffic rules are distributed by Swedish Transport Administration via the national road database channels to service providers for use in their services. The database is aiming at giving service providers access to legally valid speed limit information through NVDB-channels. Services are introduced in e.g. fleet management systems, navigation systems and mobile phone applications.
Relation with national access point set up according to EC Delegated Regulations	☐ Provide information to the national access point ☒ Receive information from the national access point ☐ No connection to the national access point
Information provision to end users	☒ Web portal ☐ Phone app ☐ VMS ☐ In-vehicle information ☐ Other: Radio

IMPLEMENTATION ASPECTS	
Year of implementation (+ end date of measure if applicable)	Start: 1990'th (beginning of ISA, intelligent speed adaptation)
Technical description	All speed limits on national road network are stored in the national road data base (NVDB). As a user you can read and download the data on Swedish transport administrations web site and you can also reach the data from Swedish national access point.
Lessons learnt / factor of success / topics considered as good practice (technical, legal, organisational, financial)	**Technical** Back end system with judicial implications have very high demands on security issues **Institutional/organisational** Investigating institutional and organisational roles and responsibilities and arranging cooperation between the actors has been a key issue. **Legal** The Swedish legislation has been changed. The traffic regulations have to be published on the dedicated website to be legally valid. All regulations had to be rewritten to achieve this and have been a prerequisite for a successful project. **Financial** Costs have been distributed to all stakeholders
Impacts assessment / results (if available)	Can be seen as a first step in a full scale implementation of ISA and expected results can be found in ISA assessment reports.

ILLUSTRATIONS	

REFERENCES	
Documentation available on the project	
Web link	Read data: www.nvdb.se/en Download data: www.trafikverket.se/tjanster/Oppna_data/hamta-var-oppna-data/lastkajen---sveriges-vag--och-jarnvagsdata/ National access point: www.trafficdata.se

1.1.4 TTIS-04 Road Weather Information

1.1.4.1 Crocodile, Datex HUB

GENERAL INFORMATION	
Name of service/system/project	Crocodile, Datex HUB
Name of operator/organisation	Hungarian Public Road Non-profit Plc.
Service delivery	☒ Public ☐ Private
Mainly applicable Deployment Guideline	DTX-DG01 DATEX II
Other relevant Deployment Guideline(s)	TIS-DG06 Weather Information Service
Contact for more information	MR. Tamás Attila TOMASCHEK tomaschek.tamas@kozut.hu MR. Máté Verdes verdes.mate@kozut.hu

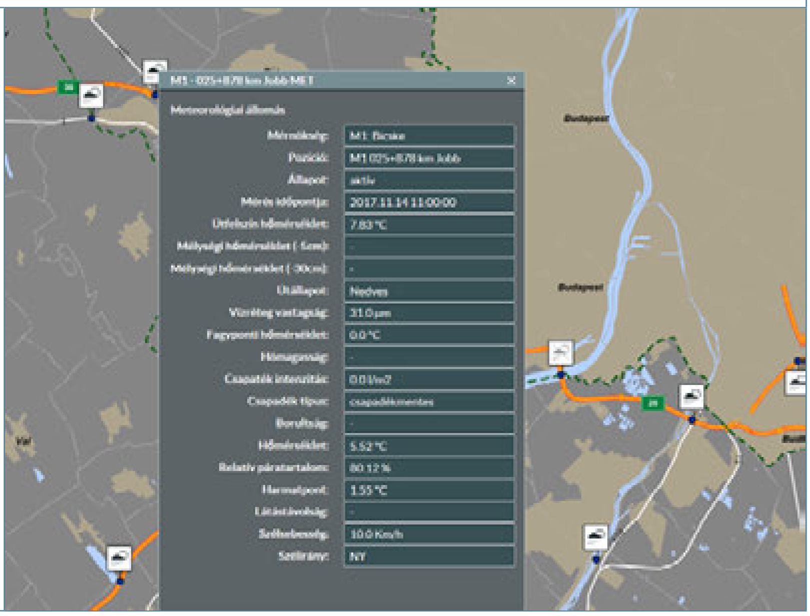
GEOGRAPHICAL ASPECTS	
Country	Hungary
Region of implementation	Weather data available for entire network of Hungarian Public Road Non-profit Plc.
Corridor(s) or Network(s) concerned	TEN-T: Mediterranean, Orient/East – Med

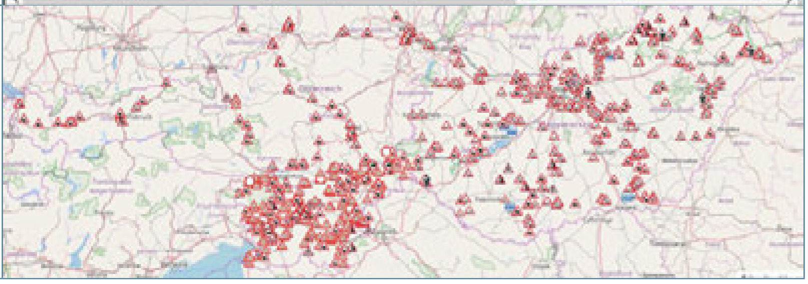
ITS SERVICE DESCRIPTION	
General Objectives	☒ Reduction of congestion ☒ Increase of safety ☐ Reduction of environmental damage ☐ Protection of the road infrastructure ☒ Increase traveller comfort ☐ Other
Specific Objectives	☐ Change the distribution in time of transport in order to achieve a more even allocation, avoiding peaks (access restrictions, fees) ☐ Change the distribution of transport in space in order to achieve a more even distribution on the network, and prevent "wrong vehicles on wrong places" (traffic control, traffic management, traffic information, access restrictions) ☐ Change the composition of vehicles on a certain piece of infrastructure (access restrictions, fees) ☐ Manage the flow on a given road section in order to reduce speed variation and thus improve the capacity and reduce the risk of incidents ☐ Manage access to a given road section in order to prevent disturbances and reduce the risk of incidents (e.g. ramp metering) ☐ Increase the speed on the link and thus increase capacity (throughput) ☒ Reduce the risk of incidents and traffic disruptions through better informed infrastructure users (traffic and traveller information) ☒ Reduce the consequences from disruptions through fast countermeasures (incident response time) ☐ Reduce traffic volumes through redistributing transport between transport modes ☐ Other
Short narrative description of your best practice including e.g. geographical dimension, numbers, target group like HGV or passengers, costs etc.	160 out of the nearly 400 weather stations of our company are located along the country's expressway network. Data coming from the sub-system (so called: Útmet) of the weather stations are integrated in our Traffic management system (FIR) and since then we are capable to share the information automatically via DATEX HUB in DATEX II format. Thanks to our camera system which contains approximately 300 surveillance cameras, 400 webcameras and approximately 100 AID cameras our operators can monitor the weather conditions real-time and country-wide.

Relation with national access point set up according to EC Delegated Regulations	☒ Provide information to the national access point ☒ Receive information from the national access point ☐ No connection to the national access point
Information provision to end users	☒ Web portal ☒ Phone app ☒ VMS ☒ In-vehicle information ☒ Other: ÚTINFORM Call Centre (ÚTINFORM is the Traffic Information Department of Hungarian Public Road Non-profit Plc.)

IMPLEMENTATION ASPECTS	
Year of implementation (+ end date of measure if applicable)	2015
Technical description	The weather sensor data is integrated to our traffic management system, and it is distributed for internal (eg. dispatching system) and external use, via the DATEX HUB. . The measured data is used also for traveller information, and even for generating C-ITS warnings. For more information please contact us!
Lessons learnt / factor of success / topics considered as good practice (technical, legal, organisational, financial)	One of the main focus of the Crocodile project was to create cross-border co-operations in order to avoid the extreme weather-related traffic jams in cross-border sections like the year of 2013 when heavy snowing caused several disruptions, in the CEE countries, that lead to traffic restrictions (mostly HGV ban) or even road closures of TEN-T sections.
Impacts assessment / results (if available)	In Crocodile phase 2 we are planning to revise the existing system, in the National Access Point decision support document.

ILLUSTRATIONS



	
Automatic DATEX II data exchange in second phase of CROCODILE:	

REFERENCES	
Documentation available on the project	
Web link	For general information: Hungarian Public Road Non-profit Plc. webpage: http://internet.kozut.hu/SitePages/Kezdolap.aspx For traffic and weather related information (on the roads): ÚTINFORM webpage: www.utinform.hu/hirek/#

1.1.4.2 Danish Road Directorate

GENERAL INFORMATION	
Name of service/system/project	Vejvejr.dk
Name of operator/organisation	Danish Road Directorate
Service delivery	☒ Public ☒ Private
Mainly applicable Deployment Guideline	TIS-DG06 Road weather Information Service
Other relevant Deployment Guideline(s)	
Contact for more information	Freddy Knudsen

GEOGRAPHICAL ASPECTS	
Country	Denmark
Region of implementation	Entire Road Network
Corridor(s) or Network(s) concerned	Entire Road Network

ITS SERVICE DESCRIPTION	
General Objectives	☒ Reduction of congestion ☒ Increase of safety ☐ Reduction of environmental damage ☐ Protection of the road infrastructure ☐ Increase traveller comfort ☒ Other: maintain passability
Specific Objectives	☐ Change the distribution in time of transport in order to achieve a more even allocation, avoiding peaks (access restrictions, fees) ☐ Change the distribution of transport in space in order to achieve a more even distribution on the network, and prevent "wrong vehicles on wrong places" (traffic control, traffic management, traffic information, access restrictions) ☐ Change the composition of vehicles on a certain piece of infrastructure (access restrictions, fees) ☐ Manage the flow on a given road section in order to reduce speed variation and thus improve the capacity and reduce the risk of incidents ☐ Manage access to a given road section in order to prevent disturbances and reduce the risk of incidents (e.g. ramp metering) ☐ Increase the speed on the link and thus increase capacity (throughput) ☒ Reduce the risk of incidents and traffic disruptions through better informed infrastructure users (traffic and traveller information) ☐ Reduce the consequences from disruptions through fast countermeasures (incident response time) ☐ Reduce traffic volumes through redistributing transport between transport modes ☐ Other
Short narrative description of your best practice including e.g. geographical dimension, numbers, target group like HGV or passengers, costs etc.	VejVejr contains extensive monitoring and forecast facilities, giving the user the best possible basis for salting at the right time. VejVejr is developed by the Danish Meteorological Institute (DMI) for Danish Road Directorate in cooperation with other road authorities. The opening screen in VejVejr is a nationwide presentation of the current situation, as well as a forecast for the next 5 hours. This is shown in the form of alarm categories for road temperature and the risk of frosting. The alarm mode is based on observations every 5 minutes from those over 475 road weather stations located around the country. The user can define areas where a schedule is prepared each hour, which gives an overall overview of the development in the coming hours. At the top of the chart you will find the alarm categories. At the click of the alarm color, you get the road forecast for the station in the area that has the highest alarm status at that time. The duty meteorologist commented ongoing situation of a number of standard fields. The user can always contact DMI's meteorologist if you are in doubt about the weather development. The station data page shows detailed observations and forecasts for the individual reload stations. The left side of the screen shows the observations from the last three hours, while the right side shows the forecast for the next five or 24 hours. A new forecast is issued once an hour.
Relation with national access point set up according to EC Delegated Regulations	☒ Provide information to the national access point ☒ Receive information from the national access point ☐ No connection to the national access point
Information provision to end users	☒ Web portal ☒ Phone app ☐ VMS ☒ In-vehicle information ☐ Other

IMPLEMENTATION ASPECTS	
Year of implementation (+ end date of measure if applicable)	in the mid of 80's for vejvejr.dk (the process has started for implementation of residual salt model)
Technical description	The model for residual salt would be evaluated and implemented until next season

Lessons learnt / factor of success / topics considered as good practice (technical, legal, organisational, financial)	Improving forecasts has one of the highest priorities
Impacts assessment / results (if available)	

ILLUSTRATIONS

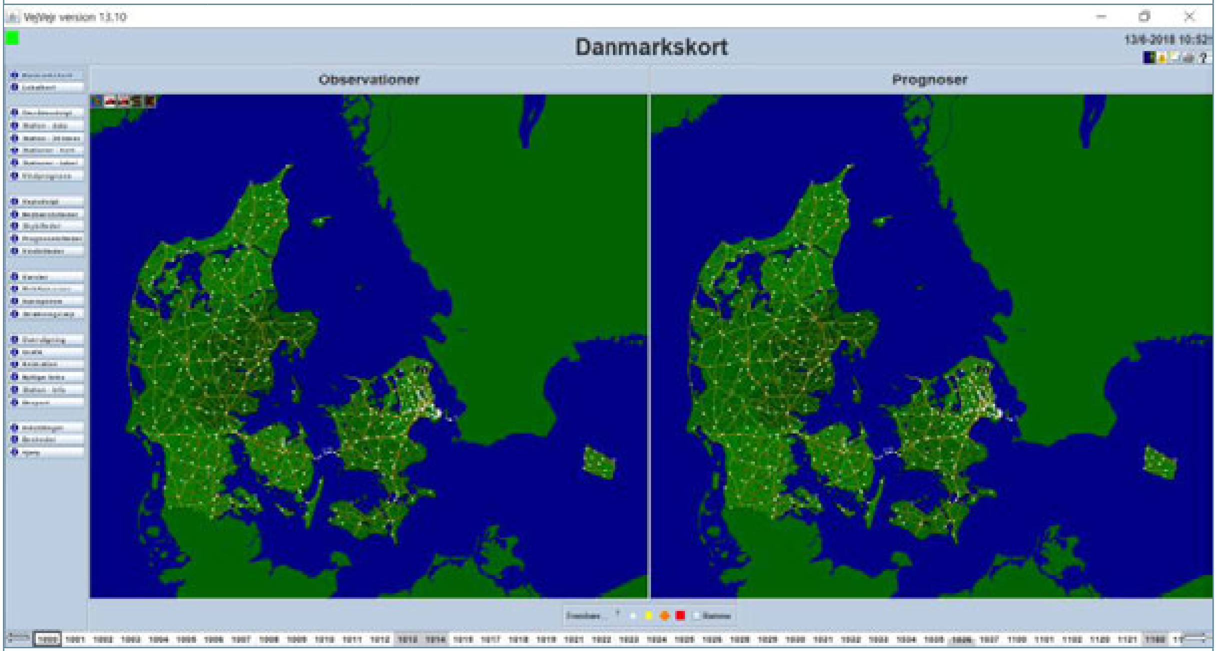


Figure 1 Alarm Map for monitoring stations

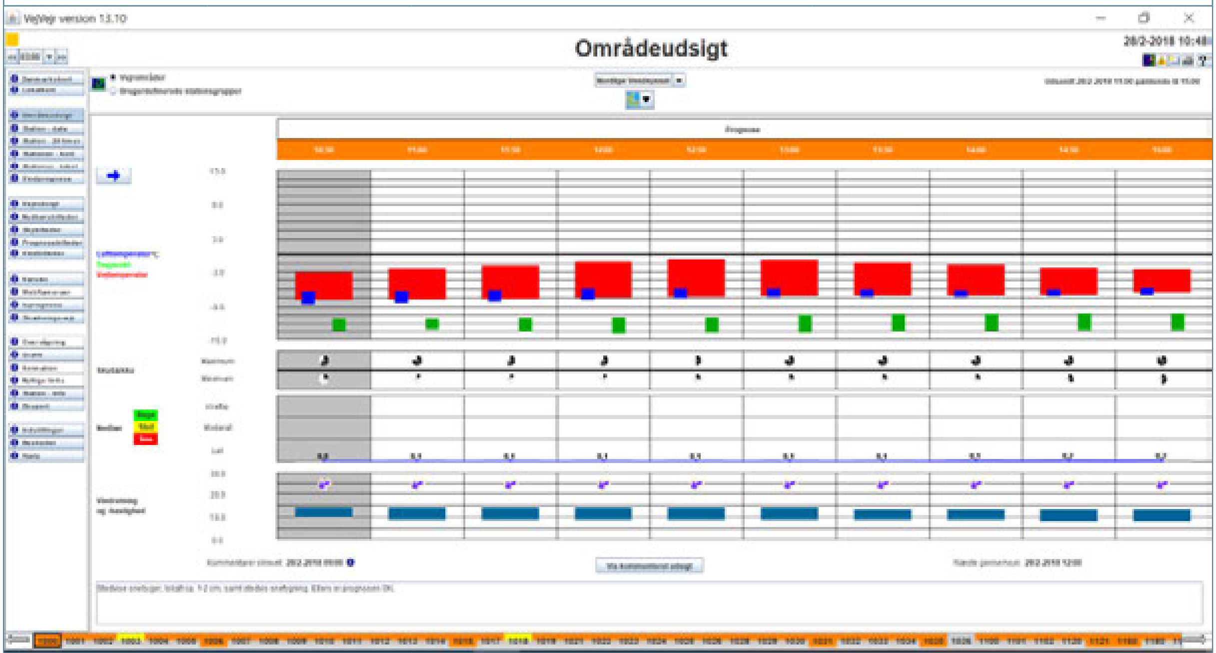


Figure 2 Area view

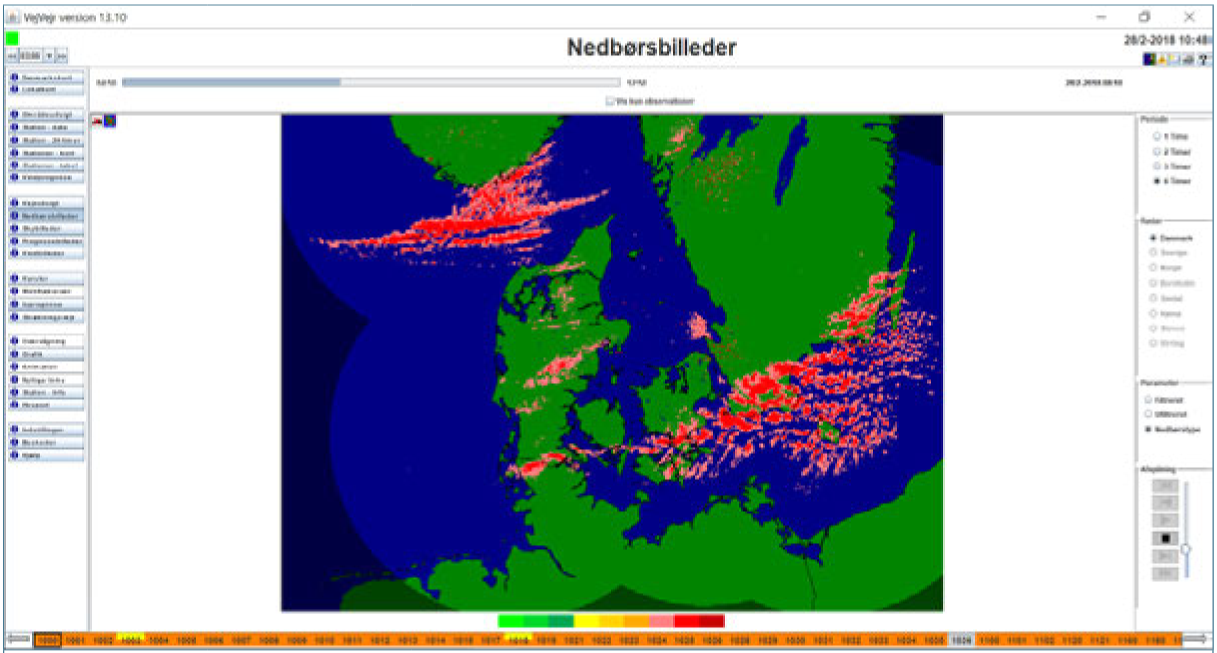


Figure 3 Precipitation picture

REFERENCES	
Documentation available on the project	Most of the documentation are in Danish language Please see more on vejvejr.dk
Web link	www.vejvejr.dk

1.1.4.3 Highways England Weather Information System

GENERAL INFORMATION	
Name of service/system/project	Highways England Weather Information System
Name of operator/organisation	Highways England, United Kingdom
Service delivery	☒ Public ☐ Private
Mainly applicable Deployment Guideline	TIS-DG06 Weather Information Service
Other relevant Deployment Guideline(s)	
Contact for more information	Steve.narroway@highwaysengland.co.uk, info@highwaysengland.co.uk

GEOGRAPHICAL ASPECTS	
Country	United Kingdom
Region of implementation	South East England
Corridor(s) or Network(s) concerned	North Sea Mediterranean / Arc Atlantique ITS Corridor

ITS SERVICE DESCRIPTION	
General Objectives	☐ Reduction of congestion ☒ Increase of safety ☐ Reduction of environmental damage ☐ Protection of the road infrastructure ☒ Increase traveller comfort ☐ Other
Specific Objectives	☐ Change the distribution in time of transport in order to achieve a more even allocation, avoiding peaks (access restrictions, fees) ☐ Change the distribution of transport in space in order to achieve a more even distribution on the network, and prevent "wrong vehicles on wrong places" (traffic control, traffic management, traffic information, access restrictions) ☐ Change the composition of vehicles on a certain piece of infrastructure (access restrictions, fees) ☐ Manage the flow on a given road section in order to reduce speed variation and thus improve the capacity and reduce the risk of incidents ☐ Manage access to a given road section in order to prevent disturbances and reduce the risk of incidents (e.g. ramp metering) ☐ Increase the speed on the link and thus increase capacity (throughput) ☒ Reduce the risk of incidents and traffic disruptions through better informed infrastructure users (traffic and traveller information) ☐ Reduce the consequences from disruptions through fast countermeasures (incident response time) ☐ Reduce traffic volumes through redistributing transport between transport modes ☐ Other
Short narrative description of your best practice including e.g. geographical dimension, numbers, target group like HGV or passengers, costs etc.	Deployment of weather information service throughout the strategic trunk road network in England. Information is provided mapped to regions and areas relating to road network management responsibilities.
Relation with national access point set up according to EC Delegated Regulations	☒ Provide information to the national access point ☐ Receive information from the national access point ☐ No connection to the national access point
Information provision to end users	☒ Web portal ☐ Phone app ☒ VMS ☐ In-vehicle information ☐ Other

IMPLEMENTATION ASPECTS	
Year of implementation (+ end date of measure if applicable)	2012
Technical description	The system consists of a number of key elements: ▪ Observations from Weather Stations located at strategic locations across the road network ▪ Forecasts from Forecast Providers ▪ A Highways England Weather Central Service (HEWCS) to collect, store and distribute weather information. ▪ HEWCS collects weather observations from around 250 weather stations across the English road network. The observation data is distributed by the system to forecast providers and subsequent site specific forecasts are received by the system. Forecast Providers also provide additional forecasts including weather alerts. ▪ HEWCS provides a website showing observation and forecast information on maps, tables and graphs to assist expert users to carry out their operational duties. A DATEXII interface is also provided for exchanging data. The public facing element will is provided by Highways England National Traffic Information Service (NTIS). NTIS receives weather information from HEWCS and delivers this to the wider public both through a website, data exchange interfaces and via the Single Access Point.

Lessons learnt / factor of success / topics considered as good practice (technical, legal, organisational, financial)	The information available covers: Weather observations including camera images, precipitation and visibility, wind speed and direction, atmospheric pressure, road surface condition and temperature. Forecast information including national weather summaries for each region (covering today, tomorrow, days 3 to 5, Days 6 to 10); Severe Weather Alerts, 24 hour Area and Domain forecasts, 24 hour route based forecasts, 2 to 10 day Area forecasts, Site Specific Forecasts. Precipitation Radar and Satellite images. Road Surface Temperature Mapping. Data quality: ▪ Weather Station observation data is collected at up to 10 minute intervals. ▪ Forecasts are delivered at an agreed schedule, for most this is typically once a day and updated on an ad-hoc basis until the next scheduled update. ▪ Functional requirements, Organisational requirements Technical requirements Look & Feel for the end user Level of Service criteria were agreed during the specification development phase. ▪ Stakeholder sessions were used to understand and specify user requirements; Review of existing systems for understanding best practice; Appropriate National/International Standards and other Best Practice was utilised as appropriate.
Impacts assessment / results (if available)	

ILLUSTRATIONS
To follow

REFERENCES	
Documentation available on the project	General descriptions of the data and services can be found at the web link below.
Web link	www.highways.gov.uk

1.1.4.4 Monitoring Centres

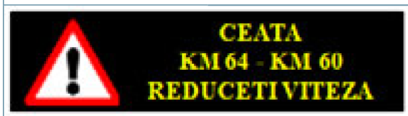
GENERAL INFORMATION	
Name of service/system/project	Monitoring Centres
Name of operator/organisation	NATIONAL COMPANY FOR ROADS INFRASTRUCTURE ADMINISTRATION
Service delivery	☒ Public ☐ Private
Mainly applicable Deployment Guideline	TIS-DG06 Weather Information
Other relevant Deployment Guideline(s)	VMS-DG01 Principles of VMS Design
Contact for more information	carmen.petrisor@andnet.ro

GEOGRAPHICAL ASPECTS	
Country	Romania (RO)
Region of implementation	Romania
Corridor(s) or Network(s) concerned	Crocodile 2; A1 Nadlac (border) to Arad, Orastie – Sibiu the 4th section and Pitesti – Bucharest; A2 Bucharest - Constanta

ITS SERVICE DESCRIPTION	
General Objectives	☒ Reduction of congestion ☒ Increase of safety ☐ Reduction of environmental damage ☐ Protection of the road infrastructure ☒ Increase traveller comfort ☐ Other
Specific Objectives	☐ Change the distribution in time of transport in order to achieve a more even allocation, avoiding peaks (access restrictions, fees) ☒ Change the distribution of transport in space in order to achieve a more even distribution on the network, and prevent "wrong vehicles on wrong places" (traffic control, traffic management, traffic information, access restrictions) ☐ Change the composition of vehicles on a certain piece of infrastructure (access restrictions, fees) ☒ Manage the flow on a given road section in order to reduce speed variation and thus improve the capacity and reduce the risk of incidents ☐ Manage access to a given road section in order to prevent disturbances and reduce the risk of incidents (e.g. ramp metering) ☐ Increase the speed on the link and thus increase capacity (throughput) ☒ Reduce the risk of incidents and traffic disruptions through better informed infrastructure users (traffic and traveller information) ☐ Reduce the consequences from disruptions through fast countermeasures (incident response time) ☐ Reduce traffic volumes through redistributing transport between transport modes ☐ Other
Short narrative description of your best practice including e.g. geographical dimension, numbers, target group like HGV or passengers, costs etc.	Weather acts through visibility impairments, precipitation, high winds, and temperature extremes to affect driver capabilities, vehicle performance (i.e., traction, stability and manoeuvrability), pavement friction, roadway infrastructure, crash risk and traffic flow. Information from weather stations are issued for temperature, humidity, visibility, rainfall, type of rainfall, wind, wind speed, atmospheric pressure, current weather, amount of rainfall, water depth, wind direction, surface conditions, surface temperature and salinity. The compact weather stations were installed in the exit road junction from big cities to the highway, in swampy areas and in areas prone to disturbing factors that can influence the quality of the road way. Generally, the sensors in asphalt have been installed in both directions of the highway, on bridges and viaducts with a length of more than 100 m, as long as the technical specifications allow it. At this moment approximately a number of 18 compact weather and 22 sensors in asphalt provide information regarding weather to the Monitoring and Information Centres, but there are a lot of other which is or will be installed on the sector of highway that were not taking over yet.
Relation with national access point set up according to EC Delegated Regulations	☐ Provide information to the national access point ☐ Receive information from the national access point ☒ No connection to the national access point
Information provision to end users	☐ Web portal ☐ Phone app ☒ VMS ☐ In-vehicle information ☐ Other

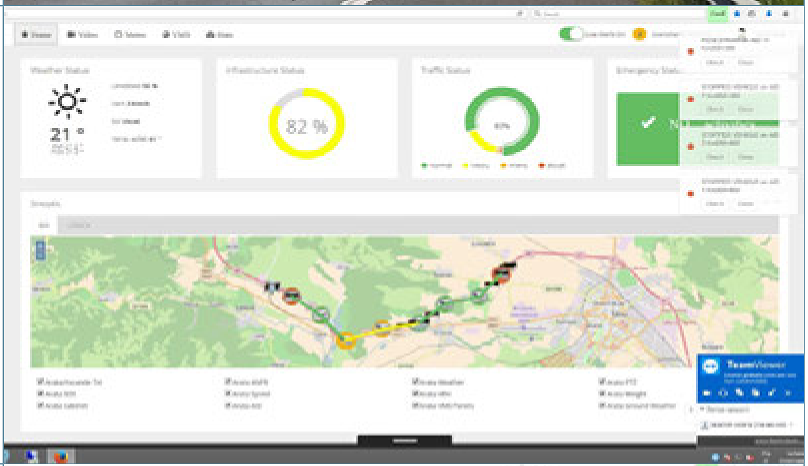
IMPLEMENTATION ASPECTS	
Year of implementation (+ end date of measure if applicable)	2011 (2012) for A2 Bucharest to Constanta 2012 (2014) for a few sectors on A1 Nadlac (border) to Bucharest

Technical description	For each sector of the highway there is a Monitoring and Information Center, where the information from weather stations and sensors in asphalt are provided. One Monitoring and Information Center monitors some of the highway's sectors which are connected to it. The highways, the ITS system and the Monitoring and Information Centers are in the administration of NATIONAL COMPANY FOR ROADS INFRASTRUCTURE ADMINISTRATION (NCRIA). At some of the Monitoring and Information Centers the operator's work schedule covers 24 hours from 24 and NCRIA intends to be the same in all the centres. The information is updated every 30 minutes. Depending on the gravity of the information received from the ITS system, the operators who work in the Monitoring and Information Center where this system is connected agreed the message and the location of the VMS (which will be load on the VMS) with the Traffic Police representative based on the "Plan of measures on the setting and display of variable messages on highways" - document signed by the both parties. The operator from the Monitoring and Information Center is the person who sent the message to the VMS in order to quickly inform the motor vehicle drivers about the respectively event. The messages on the VMS have a pictogram on the left side showing a sign representative for weather condition and in the right side, the afferent message. All text is provided in Romanian language. Generally in the message it is mentioned the event which lead to the neccesity of the messages disemination, the position where the warning is available and the advice that the motor vehicle drivers must take into account.
Lessons learnt / factor of success / topics considered as good practice (technical, legal, organisational, financial)	Cooperation with external partners based on the Action Plan or Protocol signed between NCRIA and these (i.e. the Romanian Traffic Police, the National Meteorological Administration) is a key when providing weather information to the motor vehicle drivers. The NCRIA and all its Directions, received every day information regarding weather from the National Meteorological Administration. This information is used as a weather support and prediction for an advance traffic management. Please note that in each Monitoring and Information Center there is an office of the Romanian Traffic Police and the operator from Monitoring and Information Center agrees with him the type of message and the location of VMS, before loading of each messages on the VMS.
Impacts assessment / results (if available)	Continuous increasing of demanding information leads us to a good experience gained with each additional kilometer of highway implemented. It is very important for the operator from Monitoring and Information Centers to have early information regarding metheorological conditions and road condition. Based on this information, measures can be taken in advance so as to avoid traffic jams, the occurrence of various unwelcome events and even measures for the maintenance of the roads in order to use the roads in optimal conditions for that season.

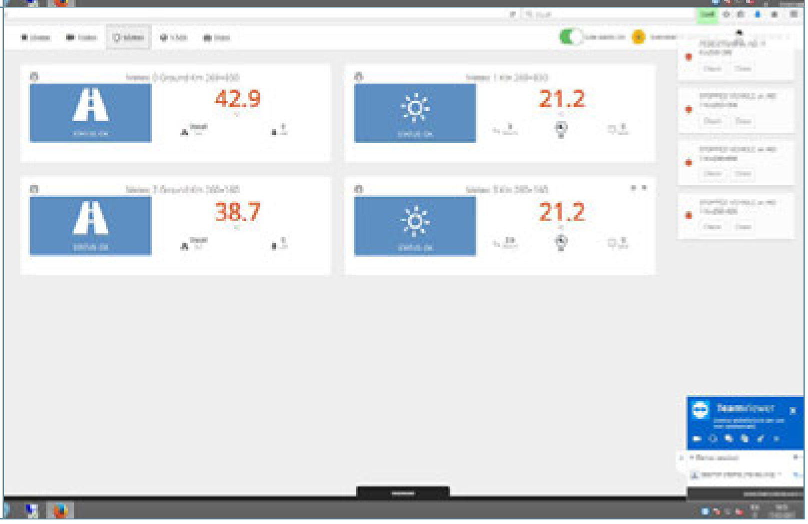
ILLUSTRATIONS	
	Example of messages on VMS for ice or slippery road on the road Advice "Speed Reduced Ahead"
	Example of messages on VMS for glazed frost or snow on the road Advice "Speed Reduced Ahead"
	Example of messages on VMS for fog or smoke on the road Advice "Speed Reduced Ahead
	Example of messages on VMS for strong wind on the road Advice "Speed Reduced Ahead"

Example of messages on VMS for strong wind on the road
Advice “Speed Reduced Ahead”

Example of information in the Monitoring and Information Ceter regarding ITS equipment functionality



Example of information provided by weather stations and sensors in asphalt



REFERENCES	
Documentation available on the project	-
Web link	-

1.1.4.5 Real-time road and street maintenance information

GENERAL INFORMATION	
Name of service/system/project	Real-time road and street maintenance information
Name of operator/organisation	Finnish Transport Infrastructure Agency, Traffic Management Finland Group (state-owned company responsible for traffic management), some major Finnish cities
Service delivery	☒ Public ☐ Private
Mainly applicable Deployment Guideline	TIS-DG06 Weather Information Service
Other relevant Deployment Guideline(s)	
Contact for more information	Matti Huju, Traficon Ltd, matti.huju@traficon.fi

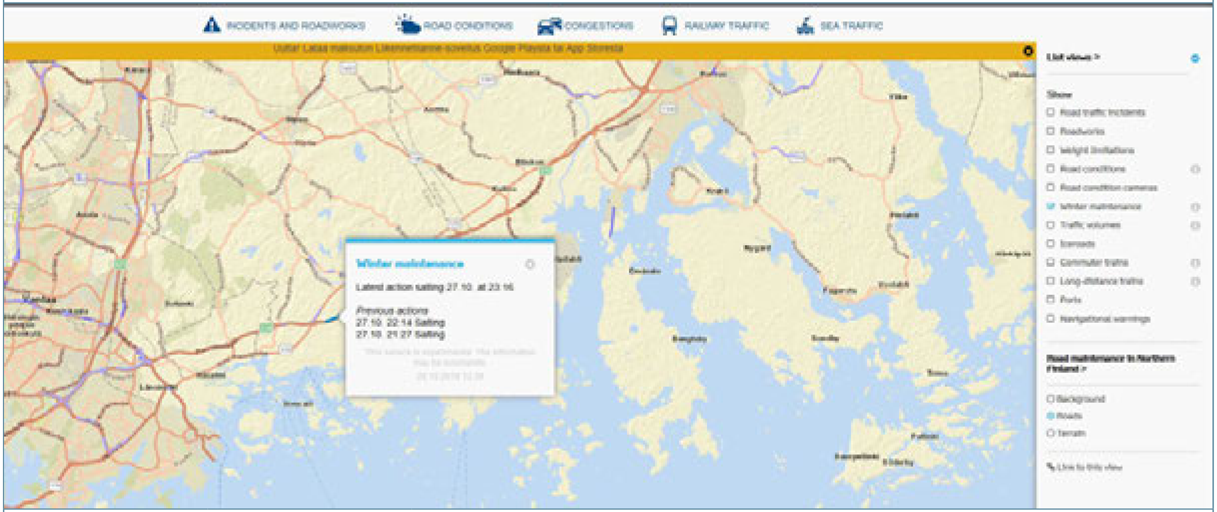
GEOGRAPHICAL ASPECTS	
Country	Finland
Region of implementation	Finland
Corridor(s) or Network(s) concerned	Finnish state road network; streets of Helsinki, Oulu, Tampere and Vantaa

ITS SERVICE DESCRIPTION	
General Objectives	☐ Reduction of congestion ☒ Increase of safety ☐ Reduction of environmental damage ☐ Protection of the road infrastructure ☐ Increase traveller comfort ☒ Other: Increase travellers' situation awareness
Specific Objectives	☐ Change the distribution in time of transport in order to achieve a more even allocation, avoiding peaks (access restrictions, fees) ☐ Change the distribution of transport in space in order to achieve a more even distribution on the network, and prevent "wrong vehicles on wrong places" (traffic control, traffic management, traffic information, access restrictions) ☐ Change the composition of vehicles on a certain piece of infrastructure (access restrictions, fees) ☐ Manage the flow on a given road section in order to reduce speed variation and thus improve the capacity and reduce the risk of incidents ☐ Manage access to a given road section in order to prevent disturbances and reduce the risk of incidents (e.g. ramp metering) ☐ Increase the speed on the link and thus increase capacity (throughput) ☒ Reduce the risk of incidents and traffic disruptions through better informed infrastructure users (traffic and traveller information) ☐ Reduce the consequences from disruptions through fast countermeasures (incident response time) ☐ Reduce traffic volumes through redistributing transport between transport modes ☐ Other
Short narrative description of your best practice including e.g. geographical dimension, numbers, target group like HGV or passengers, costs etc.	Finnish Transport Infrastructure Agency FTIA, Traffic Management Finland Group TMFG and some major cities distribute real-time road and street maintenance information for service providers as open data and for road users through web portals and mobile apps. Contractors get real-time data directly from maintenance vehicles. Road users can check beforehand the maintenance status of roads and streets on their route and prepare for road conditions and increasing travel-time in some cases or even reschedule or reroute their journey according to the information. However, road users should always use maintenance status together with weather forecasts and road condition forecasts.
Relation with national access point set up according to EC Delegated Regulations	☒ Provide information to the national access point ☐ Receive information from the national access point ☐ No connection to the national access point

Information provision to end users	☒ Web portal ☒ Phone app ☐ VMS ☐ In-vehicle information ☒ Other: APIs

IMPLEMENTATION ASPECTS	
Year of implementation (+ end date of measure if applicable)	Finnish Transport Agency FTA has published the road maintenance data as open data and through their web portal since November 2017. Since the beginning of 2019 Finnish Transport Infrastructure Agency (FTIA) has been responsible for distributing the open data and a new state-owned traffic management company Traffic Management Finland Group (TMFG) has been responsible for the web portal. The city of Helsinki has tested distributing maintenance vehicle GPS-data as open data first time in a pilot project in 2013. Because of good experiences the service has later become permanent.
Technical description	The road or street maintenance information is typically based on the following raw data: — maintenance vehicle's GPS location or path — start and end times of the maintenance measures — maintenance measure type (such as snow removal, sand or salt spreading) FTIA distributes the maintenance data regarding the state road network as open data and TMFG provides the information directly to the end-users through its web service and mobile app. The city of Tampere provides the maintenance data only through their web service. The cities of Helsinki, Oulu and Vantaa distribute the maintenance data only as open data. Web links for the services are listed under the references chapter. The maintenance information is typically visualised in a map showing the recently maintained roads and streets in different colours depending on maintenance measure time and type. In the TMFG web portal and mobile app (available for Android and iOS) the maintenance details can be checked by clicking the map. Illustrations of the TMFG web service and mobile app can be found below. The provided maintenance information is typically delayed because all road / street owners do not want to publish the exact location data of maintenance vehicles in real time. Technical limitations are also possible. On state roads the maintenance information is currently about 30 minutes delayed.
Lessons learnt / factor of success / topics considered as good practice (technical, legal, organisational, financial)	The maintenance information service for state roads has been implemented partly based on the proposals received from private road users and professional drivers. One aim is to reduce customer feedback by giving real-time map-based information. Accuracy of the information given to the road users does not have to be the same as used in maintenance contracts.
Impacts assessment / results (if available)	-

ILLUSTRATIONS



TMFG web service

REFERENCES	
Documentation available on the project	
Web link	TMFG web service: https://liikennetilanne.tmfg.fi/ Helsinki: https://auratkartalla.com/ (a free private service based on open data) Tampere: http://kartat.tampere.fi/auratkartalla/

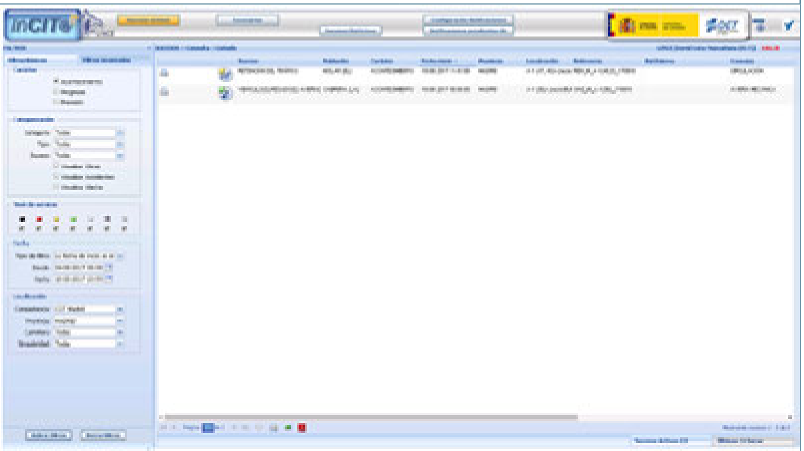
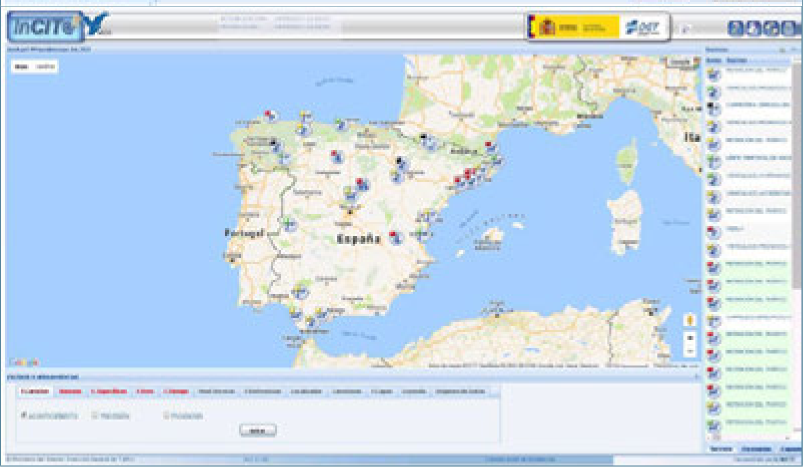
1.1.4.6 Spanish eTraffic service – weather related affecting traffic

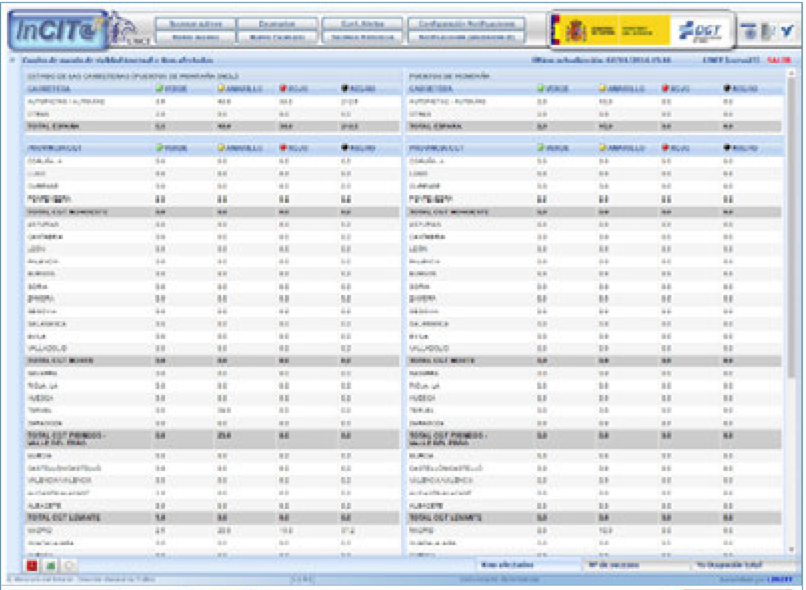
GENERAL INFORMATION	
Name of service/system/project	Spanish eTraffic service – weather related data affecting traffic
Name of operator/organisation	Spanish Directorate General for Traffic (DGT)
Service delivery	☒ Public ☐ Private
Mainly applicable Deployment Guideline	TIS-DG06 (Weather Information Service)
Other relevant Deployment Guideline(s)	
Contact for more information	sistemas.telematica@dgt.es

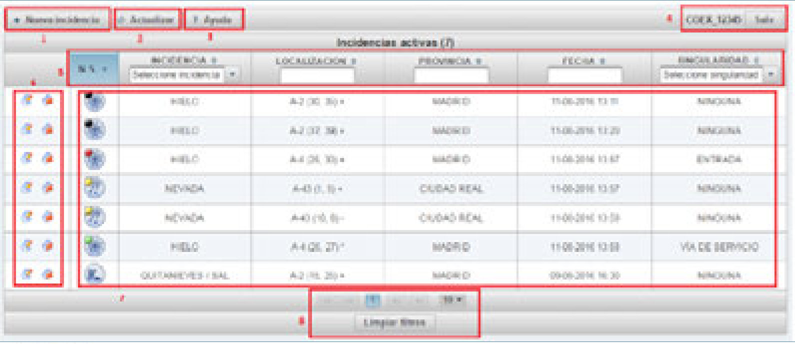
GEOGRAPHICAL ASPECTS	
Country	Spain
Region of implementation	Whole Spanish TEN-T network
Corridor(s) or Network(s) concerned	Whole Spanish TEN-T network

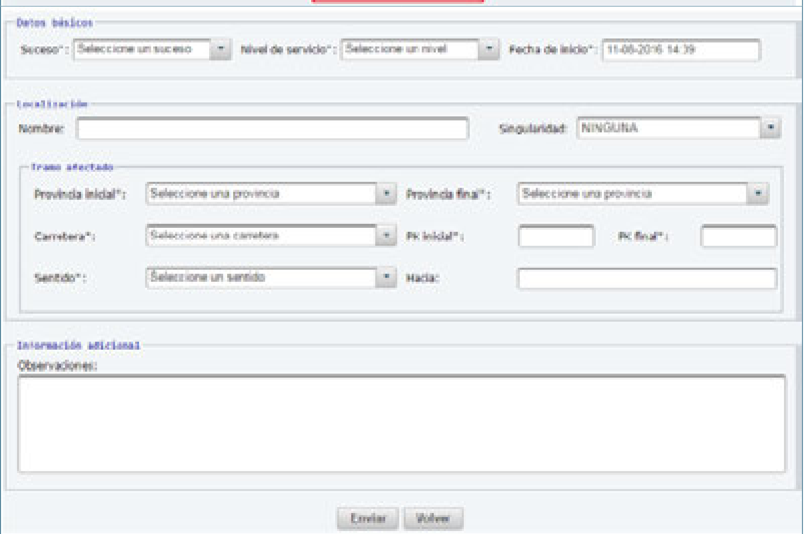
ITS SERVICE DESCRIPTION	
General Objectives	☐ Reduction of congestion ☒ Increase of safety ☐ Reduction of environmental damage ☐ Protection of the road infrastructure ☒ Increase traveller comfort ☐ Other
Specific Objectives	☐ Change the distribution in time of transport in order to achieve a more even allocation, avoiding peaks (access restrictions, fees) ☐ Change the distribution of transport in space in order to achieve a more even distribution on the network, and prevent "wrong vehicles on wrong places" (traffic control, traffic management, traffic information, access restrictions) ☒ Change the composition of vehicles on a certain piece of infrastructure (access restrictions, fees) ☐ Manage the flow on a given road section in order to reduce speed variation and thus improve the capacity and reduce the risk of incidents ☐ Manage access to a given road section in order to prevent disturbances and reduce the risk of incidents (e.g. ramp metering) ☐ Increase the speed on the link and thus increase capacity (throughput) ☒ Reduce the risk of incidents and traffic disruptions through better informed infrastructure users (traffic and traveller information) ☐ Reduce the consequences from disruptions through fast countermeasures (incident response time) ☐ Reduce traffic volumes through redistributing transport between transport modes ☐ Other
Short narrative description of your best practice including e.g. geographical dimension, numbers, target group like HGV or passengers, costs etc.	Information related to forecast of exceptional conditions is being including at the Mobility Map and available to the final users. In addition, a Winter Road Dashboard (WRD) was programmed as an interface in LINCE to complete the information provided by this platform. LINCE is one of the applications which is contributing to the NAP. Used by DGT, is a centralized web system designed to allow joint management of traffic events and traffic conditions on all roads controlled by the TMCs distributed nationwide. LINCE use VEOS to visualize, represent and search traffic events information on the map in real time. The service provides real-time traffic information integrating different sources of traffic data. The end user can access (via this single map application) all traffic information as well as the ITS road equipment installed in the Spanish TEN-T directly. In the roadmap, the user can click the traffic sensor to get real-time traffic data. Some dealerships also use IGLÚ. The purpose of IGLÚ is to facilitate road operators the direct feeding of the NAP with real time information of the road conditions during winter, to provide better information and facilitate traffic management. These aspects are intended to provide a snapshot of the road conditions in real time, so that it is easy to make a gross assessment of the need to establish lines of action aimed at improving traffic or preventing it for safety reasons. All the information available in NAP, is updated on the website, VMS, social networks, etc.
Relation with national access point set up according to EC Delegated Regulations	☒ Provide information to the national access point ☒ Receive information from the national access point ☐ No connection to the national access point
Information provision to end users	☒ Web portal ☒ Phone app ☒ VMS ☐ In-vehicle information ☒ Other: social networks

IMPLEMENTATION ASPECTS	
Year of implementation (+ end date of measure if applicable)	2006 – 2018 (on going)
Technical description	New technologies imply new developments. The objective is always to feed the NAP with quality, real-time information
Lessons learnt / factor of success / topics considered as good practice (technical, legal, organisational, financial)	Technical: The development of new applications for sharing this information on other devices Institutional/organisational: the power to share information with other administrations Legal Financial
Impacts assessment / results (if available)	Good experience

ILLUSTRATIONS	
	
	







REFERENCES	
Documentation available on the project	
Web link	http://infocar.dgt.es/etraffic/ http://nap.dgt.es

1.1.4.7 SWIS

GENERAL INFORMATION	
Name of service/system/project	SWIS
Name of operator/organisation	Federal Ministry of Transport and digital infrastructure (Germany), Deutscher Wetterdienst (meteorological service) and Transport administration of the German federal states
Service delivery	☒ Public ☐ Private
Mainly applicable Deployment Guideline	TIS-DG06 Weather Information Service
Other relevant Deployment Guideline(s)	
Contact for more information	

GEOGRAPHICAL ASPECTS	
Country	Germany
Region of implementation	Whole Germany
Corridor(s) or Network(s) concerned	

ITS SERVICE DESCRIPTION	
General Objectives	☒ Reduction of congestion ☒ Increase of safety ☒ Reduction of environmental damage ☒ Protection of the road infrastructure ☐ Increase traveller comfort ☐ Other
Specific Objectives	☐ Change the distribution in time of transport in order to achieve a more even allocation, avoiding peaks (access restrictions, fees) ☐ Change the distribution of transport in space in order to achieve a more even distribution on the network, and prevent “wrong vehicles on wrong places” (traffic control, traffic management, traffic information, access restrictions) ☐ Change the composition of vehicles on a certain piece of infrastructure (access restrictions, fees) ☒ Manage the flow on a given road section in order to reduce speed variation and thus improve the capacity and reduce the risk of incidents ☐ Manage access to a given road section in order to prevent disturbances and reduce the risk of incidents (e.g. ramp metering) ☐ Increase the speed on the link and thus increase capacity (throughput) ☐ Reduce the risk of incidents and traffic disruptions through better informed infrastructure users (traffic and traveller information) ☐ Reduce the consequences from disruptions through fast countermeasures (incident response time) ☐ Reduce traffic volumes through redistributing transport between transport modes ☐ Other
Short narrative description of your best practice including e.g. geographical dimension, numbers, target group like HGV or passengers, costs etc.	Information serves the winter service for quick and correct action to maintain road safety and capacity
Relation with national access point set up according to EC Delegated Regulations	☒ Provide information to the national access point ☒ Receive information from the national access point ☐ No connection to the national access point

Information provision to end users	☒ Web portal ☐ Phone app ☐ VMS ☐ In-vehicle information ☐ Other

IMPLEMENTATION ASPECTS	
Year of implementation (+ end date of measure if applicable)	Circa 1990 (start) circa 2000 (whole implementation)
Technical description	In cooperation with the German meteorological service available weather data is mapped to road sections. Those sections have been defined based on (a similar) meteorological/ thermal behaviour. Thematic coverage: Road condition service: air temperature, relative humidity, dew point, precipitation, road surface temperature, road surface humidity, waterfilm height, residual salt-factor, freezing temperature, deep level ground temperature (30 cm), (partly) Wind speed and direction Weather information/ prediction: cloudless, cloudy, rain, snow Official weather warning (3 levels each based on probability): Heavy rain, thunderstorm, storm, hail, sleekness, fog/ other reduced visibility, snow Data quality: Forecasting information available for up to 24h in advance, less detailed, forecast for the next 10 days., special forecasts for the points of the road weather stations
Lessons learnt / factor of success / topics considered as good practice (technical, legal, organisational, financial)	targeted winter maintenance (unknown costs savings)
Impacts assessment / results (if available)	targeted winter maintenance

ILLUSTRATIONS	

REFERENCES	
Documentation available on the project	Station list and codes (https://www.dwd.de/DE/leistungen/opendata/hilfe.html)
Web link	http://www.swis2010.dwd.de/ (only with password)

1.1.4.8 The Traffic Information Web Site "Läget i trafiken"

GENERAL INFORMATION	
Name of service/system/project	The Traffic Information Web Site "Läget i trafiken"
Name of operator/organisation	Trafikverket (the Swedish Transport Administration)
Service delivery	☒ Public ☐ Private
Mainly applicable Deployment Guideline	TIS DG 06 Weather Information
Other relevant Deployment Guideline(s)	
Contact for more information	Roberg, Clas

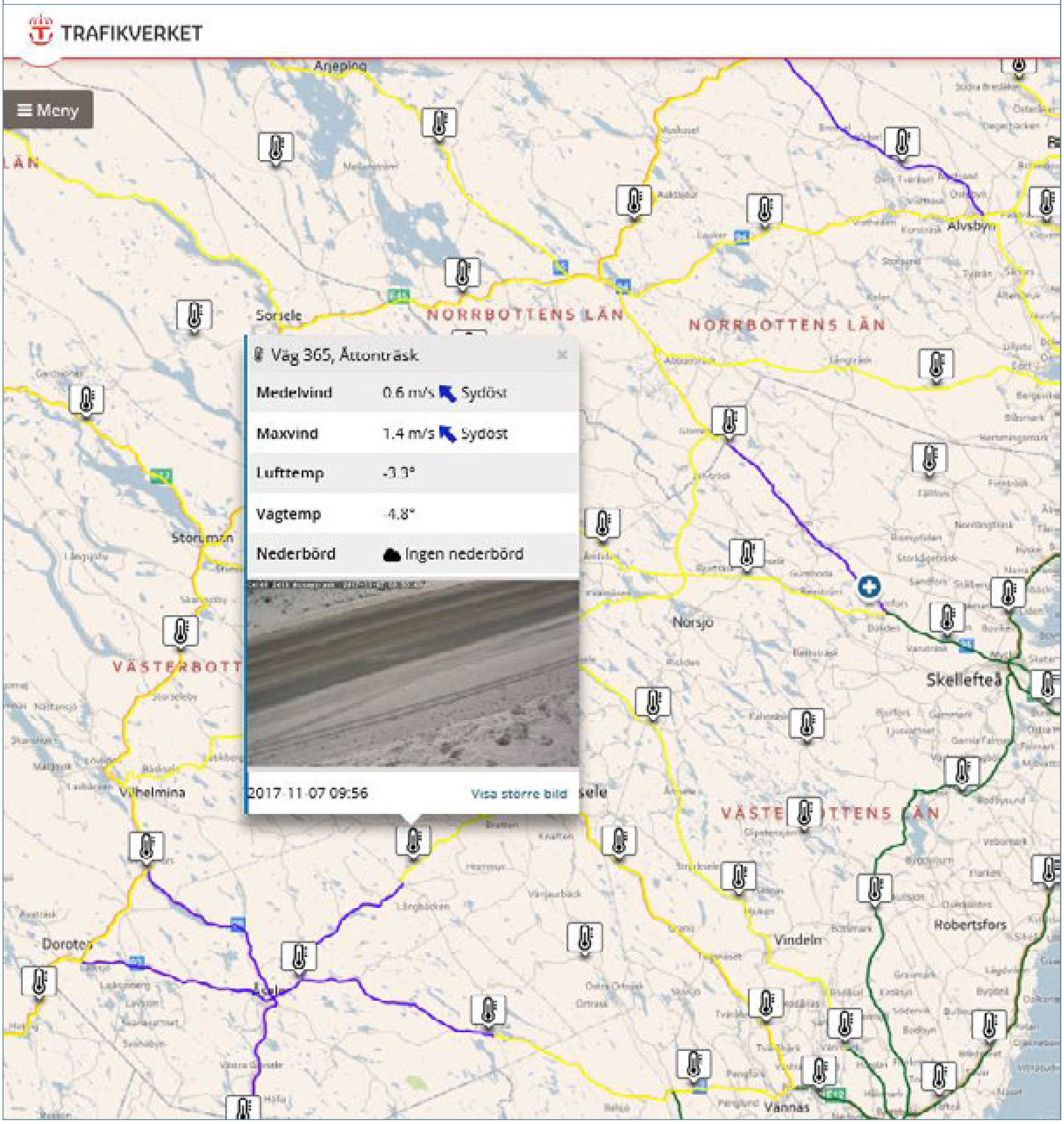
GEOGRAPHICAL ASPECTS	
Country	Sweden
Region of implementation	Nation wide
Corridor(s) or Network(s) concerned	TERN + main roads

ITS SERVICE DESCRIPTION	
General Objectives	☐ Reduction of congestion ☒ Increase of safety ☐ Reduction of environmental damage ☐ Protection of the road infrastructure ☐ Increase traveller comfort ☒ Other: Increase travellers' convenience
Specific Objectives	☐ Change the distribution in time of transport in order to achieve a more even allocation, avoiding peaks (access restrictions, fees) ☐ Change the distribution of transport in space in order to achieve a more even distribution on the network, and prevent "wrong vehicles on wrong places" (traffic control, traffic management, traffic information, access restrictions) ☐ Change the composition of vehicles on a certain piece of infrastructure (access restrictions, fees) ☐ Manage the flow on a given road section in order to reduce speed variation and thus improve the capacity and reduce the risk of incidents ☐ Manage access to a given road section in order to prevent disturbances and reduce the risk of incidents (e.g. ramp metering) ☐ Increase the speed on the link and thus increase capacity (throughput) ☐ Reduce the risk of incidents and traffic disruptions through better informed infrastructure users (traffic and traveller information) ☐ Reduce the consequences from disruptions through fast countermeasures (incident response time) ☐ Reduce traffic volumes through redistributing transport between transport modes ☐ Other
Short narrative description of your best practice including e.g. geographical dimension, numbers, target group like HGV or passengers, costs etc.	Weather information for travellers (end user service) were road conditions and weather situation is displayed on the web site "Läget i Trafiken". The road condition data is mapped to meteorological sections. Those sections have been defined based on (a similar) meteorological/ thermal behaviour. The weather information displayed to the public is: Average wind, Max wind, Precipitation and Temperature. Public road weather information during winter: Wind, precipitation, temperature, road conditions (dry, wet, ice, snow, slush), prediction of slipperiness Warnings: Slipperiness, strong wind, heavy precipitation , reduced visibility
Relation with national access point set up according to EC Delegated Regulations	☐ Provide information to the national access point ☒ Receive information from the national access point ☐ No connection to the national access point
Information provision to end users	☒ Web portal ☐ Phone app ☐ VMS ☐ In-vehicle information ☐ Other

IMPLEMENTATION ASPECTS	
Year of implementation (+ end date of measure if applicable)	
Technical description	220 Camera stations and approximately 1000 weather stations are delivering data every 30 minutes. The stations are positioned in cold spots and the mapping is performed with a measuring car. Data is combined with data from the Swedish Meteorological Institute and data from road maintenance operators. Support of road maintenance and infrastructure management (expert service). The expert service includes action planning for winter maintenance/operation and also support for payment for winter operation. The information used in the expert system is: ▪ Road surface temperature ▪ Humidity ▪ Dew point temperature (condensation temperature) ▪ Air temperature ▪ Precipitation (type and volume) ▪ Wind speed and direction

Lessons learnt / factor of success / topics considered as good practice (technical, legal, organisational, financial)	This service is seen as safety related traveller information which should be delivered free of charge to the public. The usage of the service is very high during harsh weather conditions resulting in very high demands on the technical implementation and operation.
Impacts assessment / results (if available)	During harsh weather conditions the usage is very high, resulting in major impact on traveler behavior and thus traffic safety.

ILLUSTRATIONS



REFERENCES

Documentation available on the project	
Web link	www.trafikverket.se/trafikinformation/vag

1.1.4.9 Traffic Scotland Weather Information Services

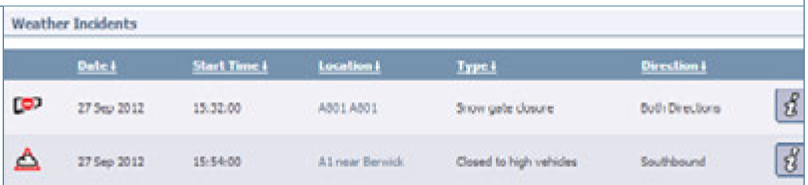
GENERAL INFORMATION	
Name of service/system/project	Traffic Scotland Weather Information Services
Name of operator/organisation	Transport Scotland
Service delivery	☒ Public ☐ Private
Mainly applicable Deployment Guideline	TIS Weather Information Services
Other relevant Deployment Guideline(s)	
Contact for more information	Peter McGillion, Transport Scotland e: Peter.McGillion@transport.gov.scot

GEOGRAPHICAL ASPECTS	
Country	Scotland, UK
Region of implementation	Scotland, UK
Corridor(s) or Network(s) concerned	Trunk Road Network including Arc Atlantique Corridor

ITS SERVICE DESCRIPTION	
General Objectives	☐ Reduction of congestion ☒ Increase of safety ☐ Reduction of environmental damage ☐ Protection of the road infrastructure ☒ Increase traveller comfort ☐ Other
Specific Objectives	☐ Change the distribution in time of transport in order to achieve a more even allocation, avoiding peaks (access restrictions, fees) ☐ Change the distribution of transport in space in order to achieve a more even distribution on the network, and prevent “wrong vehicles on wrong places” (traffic control, traffic management, traffic information, access restrictions) ☐ Change the composition of vehicles on a certain piece of infrastructure (access restrictions, fees) ☐ Manage the flow on a given road section in order to reduce speed variation and thus improve the capacity and reduce the risk of incidents ☐ Manage access to a given road section in order to prevent disturbances and reduce the risk of incidents (e.g. ramp metering) ☐ Increase the speed on the link and thus increase capacity (throughput) ☒ Reduce the risk of incidents and traffic disruptions through better informed infrastructure users (traffic and traveller information) ☐ Reduce the consequences from disruptions through fast countermeasures (incident response time) ☐ Reduce traffic volumes through redistributing transport between transport modes ☐ Other
Short narrative description of your best practice including e.g. geographical dimension, numbers, target group like HGV or passengers, costs etc.	Weather information is provided all year with enhanced information provided between October and May.
Relation with national access point set up according to EC Delegated Regulations	☒ Provide information to the national access point ☐ Receive information from the national access point ☐ No connection to the national access point
Information provision to end users	☒ Web portal ☐ Phone app ☒ VMS ☐ In-vehicle information ☒ Other: Mobile site, Internet radio, Twitter feed

IMPLEMENTATION ASPECTS	
Year of implementation (+ end date of measure if applicable)	Ongoing additions and enhancements
Technical description	Information includes: ▪ Real time, road side, weather station information – 150+ sites providing road temperature, road surface conditions, air temperature, wind speed/direction, precipitation and camera images where available (via Vaisala FTP service) ▪ Regional weather forecasts – across 5 Scottish regions (xml feed from UK Met Office) ▪ Regional weather alerts - across 5 Scottish regions (xml feed from UK Met Office) ▪ Localised weather alerts and weather incidents ▪ Gritters and winter salt treatment maps and information ▪ Weather related VMS messages ▪ Winter information campaigns and Winter driving advice and guidance ▪ Trunk Road Height Map – highlights roads by height above sea level, used for planning journeys during winter weather ▪ Snow gate closures ▪ VMS message sets to be used before and during weather events
Lessons learnt / factor of success / topics considered as good practice (technical, legal, organisational, financial)	▪ Advanced planning essential for winter period ▪ Services come under additional scrutiny and user demand in winter periods, therefore resilience is vital ▪ End user expectation is high ▪ Agreed and documented process and procedures to ensure weather related activities (treatments / closures / delays / conditions) from regional operating companies are provided to Traffic Scotland ▪ Benefits from close cooperation with the Met Office and inclusion of their services ▪ Benefits from cooperation with Police
Impacts assessment / results (if available)	No formal evaluation undertaken / any user feedback

ILLUSTRATIONS


Weather Incidents

	Date	Start Time	Location	Type	Direction
	27 Sep 2012	15:32:00	A801 A801	Snow gate closure	Both Directions
	27 Sep 2012	15:54:00	A1 near Berwick	Closed to high vehicles	Southbound

Website weather incident example (snow gate closure and weather event)


Weather station location map

Typical winter road side image from a weather station

	Authorised VMS weather legends

REFERENCES	
Documentation available on the project	Information provided in links above
Web link	Mobile - https://my.trafficscotland.org/ Desktop - https://trafficscotland.org/

1.1.4.10 Weather impact assessment team

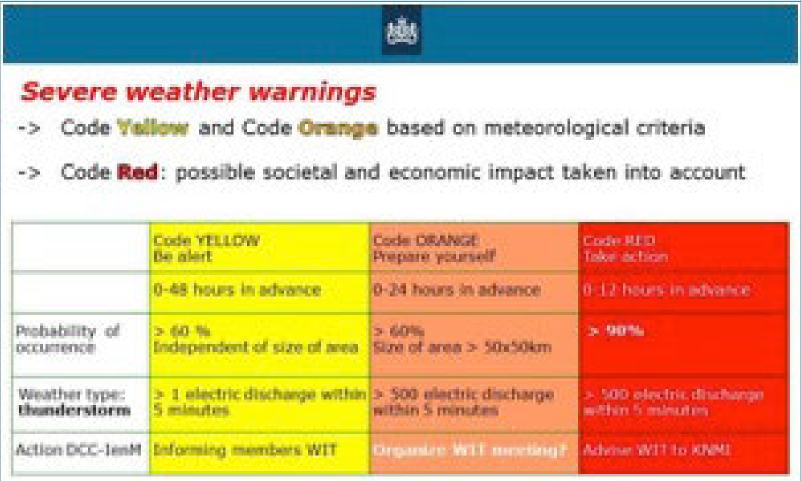
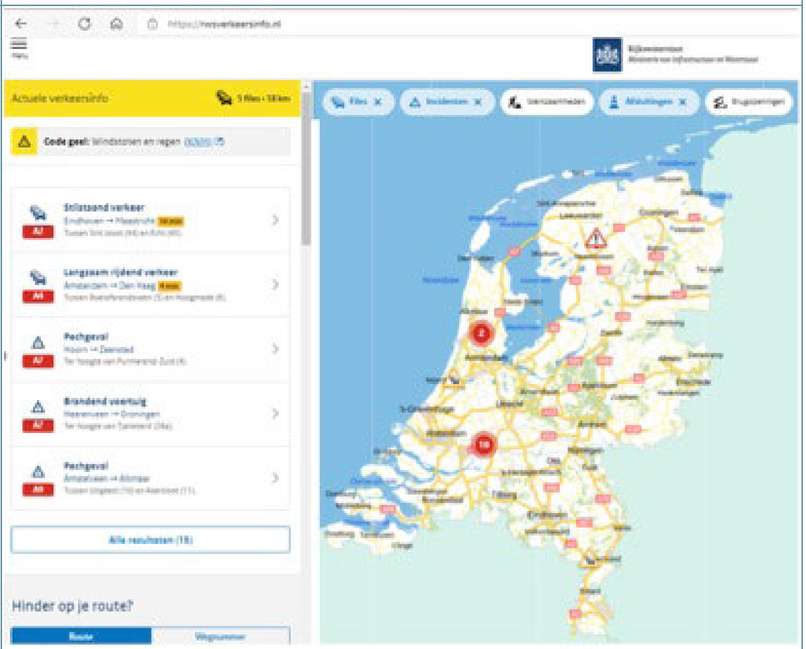
GENERAL INFORMATION	
Name of service/system/project	Weather impact assessment team
Name of operator/organisation	Rijkswaterstaat
Service delivery	☒ Public ☐ Private
Mainly applicable Deployment Guideline	TIS-DG06 Weather Information Service
Other relevant Deployment Guideline(s)	
Contact for more information	Ellen Moens

GEOGRAPHICAL ASPECTS	
Country	The Netherlands
Region of implementation	National road network
Corridor(s) or Network(s) concerned	National road network

ITS SERVICE DESCRIPTION	
General Objectives	☒ Reduction of congestion ☒ Increase of safety ☐ Reduction of environmental damage ☐ Protection of the road infrastructure ☐ Increase traveller comfort ☐ Other

Specific Objectives	☐ Change the distribution in time of transport in order to achieve a more even allocation, avoiding peaks (access restrictions, fees) ☐ Change the distribution of transport in space in order to achieve a more even distribution on the network, and prevent "wrong vehicles on wrong places" (traffic control, traffic management, traffic information, access restrictions) ☐ Change the composition of vehicles on a certain piece of infrastructure (access restrictions, fees) ☐ Manage the flow on a given road section in order to reduce speed variation and thus improve the capacity and reduce the risk of incidents ☐ Manage access to a given road section in order to prevent disturbances and reduce the risk of incidents (e.g. ramp metering) ☐ Increase the speed on the link and thus increase capacity (throughput) ☒ Reduce the risk of incidents and traffic disruptions through better informed infrastructure users (traffic and traveller information) ☐ Reduce the consequences from disruptions through fast countermeasures (incident response time) ☐ Reduce traffic volumes through redistributing transport between transport modes ☐ Other
Short narrative description of your best practice including e.g. geographical dimension, numbers, target group like HGV or passengers, costs etc.	The Royal Netherlands Meteorological Institute (KNMI) is the Dutch national weather service. In case the weather could become a risk the KNMI gives a warning so one can prepare themselves. Based on the weather forecast the KNMI consults the Weather Impact Team (WIT) in case a decision has to be made for a yes or no for a 'code red weather alert'. This WIT advices the KNMI about the effect of weather forecast on road traffic, railway, shipping, aviation and public safety. The following partners cooperate in the WIT; Departmental Crisiscoordination Center (DCC), National Crisis Center (NCC), National Traffic Centre (VCNL), Air Traffic Control Center (LVNL) and Railway (ProRail). The National Traffic Center of Rijkswaterstaat advices about the impact on road traffic taking into account the daily situation on the network (e.g. events, rush hours, roadworks). The chair of WIT decides in cooperation with chair of KNMI expert team if the WIT has to be activated. Often this will be the case when the probability is near 60% when the weather code could be qualified as 'orange' or 'red'. A organisational requirement is the response time of the WIT; the team has to act and decide within 2 hours. Also the impact of weather forecast will be taken into account. In case a weather situation is labelled as code 'red' the National traffic centre will inform road users via Service Providers (radio), alerts on road text panels, alerts on social media via Twitter (https://twitter.com/RWSverkeersinfo), alerts on the website www.rwsverkeersinfo.nl, including liveblogs. If necessary the Traffic Center will take extra actions like extra Road inspectors, winter maintenance, extra recovery vehicles on specific locations (for example Moerdijk bridge when there's a storm from the west).
Relation with national access point set up according to EC Delegated Regulations	☐ Provide information to the national access point ☐ Receive information from the national access point ☒ No connection to the national access point
Information provision to end users	☒ Web portal ☐ Phone app ☒ VMS ☐ In-vehicle information ☒ Other: Radio, twitter, website.

IMPLEMENTATION ASPECTS	
Year of implementation (+ end date of measure if applicable)	The WIT started in 2012.
Technical description	
Lessons learnt / factor of success / topics considered as good practice (technical, legal, organisational, financial)	National warnings could be further developed to regional warnings.
Impacts assessment / results (if available)	

ILLUSTRATIONS	
	
	

Severe weather warnings

-> Code Yellow and Code Orange based on meteorological criteria

-> Code Red: possible societal and economic impact taken into account

	Code YELLOW Be alert	Code ORANGE Prepare yourself	Code RED Take action
	0-48 hours in advance	0-24 hours in advance	0-12 hours in advance
Probability of occurrence	> 60 % Independent of size of area	> 60% Size of area > 50x50km	> 90%
Weather type: **thunderstorm**	> 1 electric discharge within 5 minutes	> 500 electric discharge within 5 minutes	> 500 electric discharge within 5 minutes
Action DCC-IenM	Informing members WIT	Organize WIT meeting?	Advise WIT to KNMI

REFERENCES	
Documentation available on the project	
Web link	www.knmi.nl/over-het-knmi/about

1.1.4.11 Weather information

GENERAL INFORMATION	
Name of service/system/project	Weather information
Name of operator/organisation	Austrian motorway operator ASFINAG
Service delivery	☒ Public ☒ Private

Mainly applicable Deployment Guideline	TIS-DG06 - Weather Information Service
Other relevant Deployment Guideline(s)	
Contact for more information	Martin.nemec@asfinag.at

GEOGRAPHICAL ASPECTS	
Country	Austria
Region of implementation	Weather data is available for whole Austrian TERN. Data is mapped to meteorological sections
Corridor(s) or Network(s) concerned	2.200km (Complete highway level motorway network in Austria)

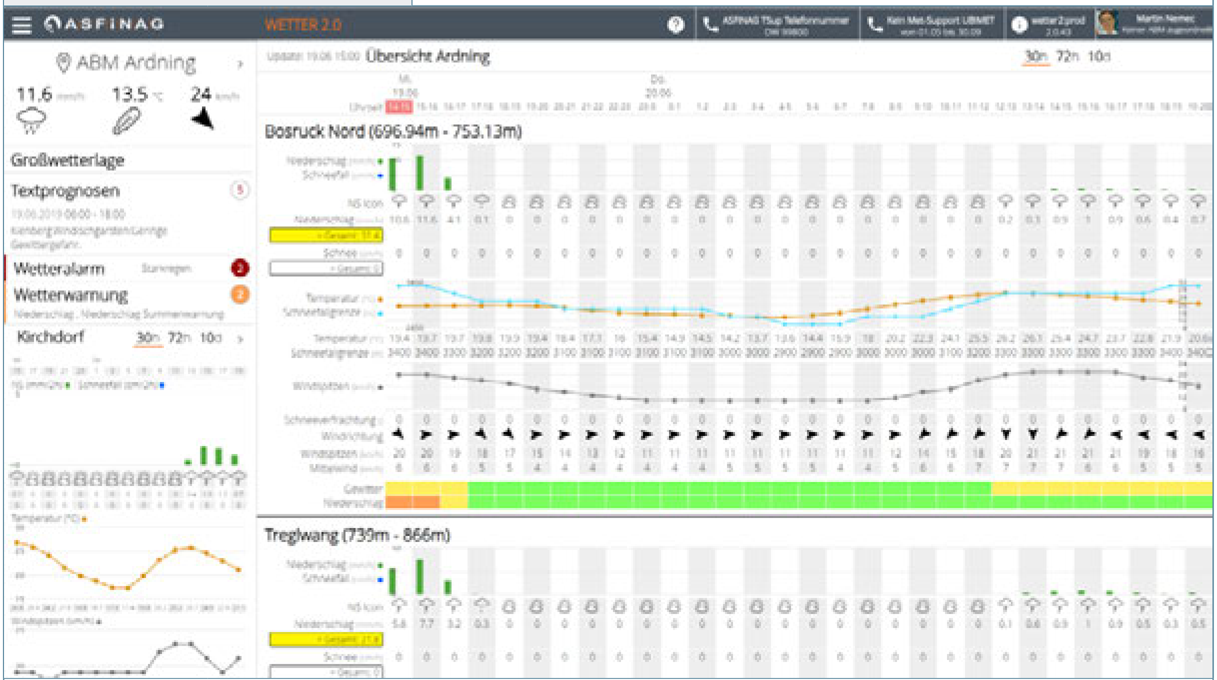
ITS SERVICE DESCRIPTION	
General Objectives	☐ Reduction of congestion ☒ Increase of safety ☐ Reduction of environmental damage ☐ Protection of the road infrastructure ☐ Increase traveller comfort ☒ Other: Increase travellers' convenience
Specific Objectives	☒ Manage the flow on a given road section in order to reduce speed variation and thus improve the capacity and reduce the risk of incidents
Short narrative description of your best practice including e.g. geographical dimension, numbers, target group like HGV or passengers, costs etc.	ASFINAG has superseded the road weather information system with a new weather data provider and a new general approach. The old system was provided as a onestop shop including a tool to browse through the weather situations throughout Austria. With the reimplementation of the road weather information system the following approach has been adopted: ▪ The Austrian third party provider Ubimet is providing a very exhausted and detailed set of weather information (current + prognosis) to ASFINAG ▪ ASFINAG has implemented a web gui for visualization of the data. This portal is used internally by the operators for e.g. management of the snow plows ▪ Based on the provided data weather a set of weather warnings is also generated which is provided to end users via existing channels (e.g. ASFINAG App)
Relation with national access point set up according to EC Delegated Regulations	☒ Provide information to the national access point ☐ Receive information from the national access point ☐ No connection to the national access point
Information provision to end users	☐ Web portal ☒ Phone app ☐ VMS ☐ In-vehicle information ☐ Other

IMPLEMENTATION ASPECTS	
Year of implementation (+ end date of measure if applicable)	2018
Technical description	With the reimplementation of the road weather information system the following approach has been adopted: ▪ The Austrian third party provider Ubimet is providing a very exhausted and detailed set of weather information (current + prognosis) to ASFINAG ▪ ASFINAG has implemented a web gui for visualization of the data. This portal is used internally by the operators for e.g. management of the snow plows ▪ Based on the provided data weather a set of weather warnings is also generated which is provided to end users via existing channels (e.g. ASFINAG App) The web-GUI is based on AngularJS technology and a Leaflet based framework that we have developed within ASFINAG.

Lessons learnt / factor of success / topics considered as good practice (technical, legal, organisational, financial)	The split between data provision by third party and internal development of presentation layer has been a very effective way in order to: ▪ Reduce total costs ▪ Tailor the presentation of ASFINAG' needs
Impacts assessment / results (if available)	-

ILLUSTRATIONS

Visualization in public end user app. As an icon a general icon taken from the road law is used to present general weather warnings. More details (e.g. type of weather warning, location etc.) are provided via textual information.
The decision against the usage of icons as proposed in the Deployment Guideline has been taken in order to reduce the effort needed by the end users. With our approach only one icons needs to be recongnised in order to build the connex to weather warning. The rest is conveyed via textual information (currently under translation)



For internal purpose (and as a basis for the public information as described above) a full blown webportal has been developed and is powered by external data provider Ubimet.

REFERENCES

Documentation available on the project	Currently no publicly available information is offered
Web link	https://wetter.asfinag.at

1.1.4.12 RWS De-icing map of the road during winter

GENERAL INFORMATION	
Name of service/system/project	RWS De-icing map of the road during winter
Name of operator/organisation	Rijkswaterstaat
Service delivery	☒ Public ☐ Private
Mainly applicable Deployment Guideline	TIS-DG06 Weather Information Service
Other relevant Deployment Guideline(s)	
Contact for more information	Rini Donker

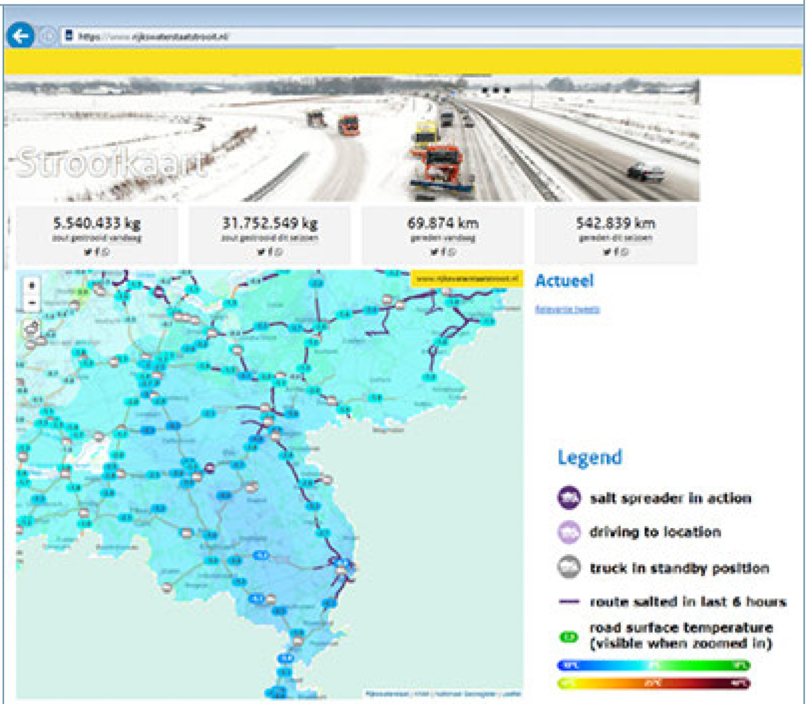
GEOGRAPHICAL ASPECTS	
Country	The Netherlands
Region of implementation	National road network
Corridor(s) or Network(s) concerned	

ITS SERVICE DESCRIPTION	
General Objectives	☒ Reduction of congestion ☒ Increase of safety ☐ Reduction of environmental damage ☐ Protection of the road infrastructure ☐ Increase traveller comfort ☐ Other
Specific Objectives	☒ Change the distribution in time of transport in order to achieve a more even allocation, avoiding peaks (access restrictions, fees) ☐ Change the distribution of transport in space in order to achieve a more even distribution on the network, and prevent “wrong vehicles on wrong places” (traffic control, traffic management, traffic information, access restrictions) ☐ Change the composition of vehicles on a certain piece of infrastructure (access restrictions, fees) ☐ Manage the flow on a given road section in order to reduce speed variation and thus improve the capacity and reduce the risk of incidents ☐ Manage access to a given road section in order to prevent disturbances and reduce the risk of incidents (e.g. ramp metering) ☐ Increase the speed on the link and thus increase capacity (throughput) ☒ Reduce the risk of incidents and traffic disruptions through better informed infrastructure users (traffic and traveller information) ☐ Reduce the consequences from disruptions through fast countermeasures (incident response time) ☐ Reduce traffic volumes through redistributing transport between transport modes ☐ Other

Short narrative description of your best practice including e.g. geographical dimension, numbers, target group like HGV or passengers, costs etc.	To keep the traffic safe on the national roads during winter, the de-icing process is very important in the Netherlands. The webpage https://rijkswaterstaatstrooit.nl shows live the de-icing activities of Rijkswaterstaat (RWS) during winter when snow and frost are causing slippery roads. The map shows live: ▪ the locations of salt spreaders/snow ploughs (ice gritters) on the main network ▪ the routes salted last 6 hours and ▪ road surface temperature. From the current moment one can look back what the situation was in the last 6 hours of road temperature, radar weather maps and location of salt spreaders. The map can show a forecast of 'road surface temperature' and weather maps up to two hours ahead. During winter RWS is continuously monitoring the temperature of the road surface, the concentration of salt and amount of moist on the road. As soon there is a chance of slippery roads, the de-icing activities will start where needed, often at night when temperatures are low. The total available fleet (private) consists of about 1200 salt spreaders and 560 snow plough trucks. The whole national road network can be salted within 2 hours costing about € 500.000 at a time. During summer more than 200 million kg salt is stored.
Relation with national access point set up according to EC Delegated Regulations	☐ Provide information to the national access point ☐ Receive information from the national access point ☒ No connection to the national access point
Information provision to end users	☒ Web portal ☐ Phone app ☐ VMS ☐ In-vehicle information ☒ Other; please specify: https://twitter.com/rijkswaterstaat

IMPLEMENTATION ASPECTS	
Year of implementation (+ end date of measure if applicable)	Major update 1-1-2018
Technical description	The whole de-icing process runs digitally, starting at road temperature and forecast, route planning for salt spreaders and timing, and ending with amount of salt used and finance/ costs. Starting with an RWS road weather info system consisting of 330 measure points which delivers roads surface temperature data to the Dutch national weather service (KNMI) which runs the data through a model producing current and 2-hour predictions data. These temperatures are shown live (updated each 5 minutes) on the map. Temperature combined with weather forecast are monitored to decide at which moment the RWS de-icing program has to start. The whole fleet of spreaders is equipped with a track & tracing system and the location of all trucks are shown live on the map as well (updated every 20 seconds).
Lessons learnt / factor of success / topics considered as good practice (technical, legal, organisational, financial)	▪ Pilots in 2020/21 have shown added value in combining data of the road weather info system with in-car data (road friction, use of windshield wiper, outside car temperature). It is expected that building new weather info system including the usage of in-car data will make it possible to include the regional roads as well in a sufficient and cost-effective way.
Impacts assessment / results (if available)	The de-icing map is often consulted by service providers to broadcast information about the road condition to the road users.

ILLUSTRATIONS



Detail map showing location of salt spreaders, salted routes and road surface temperature. (https://rijkswaterstaatstrooit.nl/)

Trucks equipped with salt spreader and snow plough in action on a national road.

REFERENCES

Documentation available on the project	
Web link	https://rijkswaterstaatstrooit.nl/ https://twitter.com/rijkswaterstaat

1.1.5 TTIS-05 Multimodal Travel Information Service

1.1.5.1 Automated Gate System at the port of Venice/URSA MAJOR neo

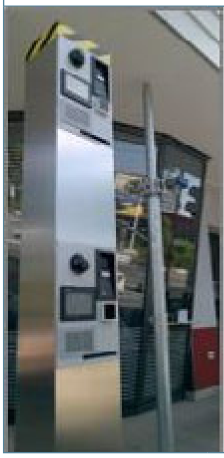
GENERAL INFORMATION	
Name of service/system/project	Automated Gate System at the port of Venice/URSA MAJOR neo
Name of operator/organisation	North Adriatic Sea Port Authority (NASPA, Ports of Venice and Chioggia)
Service delivery	☒ Public ☐ Private
Mainly applicable Deployment Guideline	TIS-DG07 - Co-Modal Traveller Information
Other relevant Deployment Guideline(s)	
Contact for more information	mara.pitaccolo@port.venice.it

GEOGRAPHICAL ASPECTS	
Country	Italy
Region of implementation	Veneto Region
Corridor(s) or Network(s) concerned	Med and Baltic-Adriatic Corridor, URSA MAJOR neo

ITS SERVICE DESCRIPTION	
General Objectives	☒ Reduction of congestion ☒ Increase of safety ☐ Reduction of environmental damage ☐ Protection of the road infrastructure ☐ Increase traveller comfort ☒ Other: increased security control
Specific Objectives	☐ Change the distribution in time of transport in order to achieve a more even allocation, avoiding peaks (access restrictions, fees) ☒ Change the distribution of transport in space in order to achieve a more even distribution on the network and prevent "wrong vehicles on wrong places" (traffic control, traffic management, traffic information, access restrictions) ☐ Change the composition of vehicles on a certain piece of infrastructure (access restrictions, fees) ☒ Manage the flow on a given road section in order to reduce speed variation and thus improve the capacity and reduce the risk of incidents ☒ Manage access to a given road section in order to prevent disturbances and reduce the risk of incidents (e.g. ramp metering) ☒ Increase the speed on the link and thus increase capacity (throughput) ☐ Reduce the risk of incidents and traffic disruptions through better informed infrastructure users (traffic and traveller information) ☐ Reduce the consequences from disruptions through fast countermeasures (incident response time) ☐ Reduce traffic volumes through redistributing transport between transport modes ☒ Other: increased security control
Short narrative description of your best practice including e.g. geographical dimension, numbers, target group like HGV or passengers, costs etc.	The Port of Venice has direct access to national and European Road and Rail Core Corridors (Med and Baltic-Adriatic Corridor). North Adriatic Sea Port Authority is striving to improve the road access to the commercial and passenger terminals to relieve roads from heavy traffic and increase their safety. Within the framework of URSA MAJOR NEO , North Adriatic Sea Port Authority has implemented a new ITS solutions for the access control system at the two main gates of Porto Marghera, the commercial port area of Venice.
Relation with national access point set up according to EC Delegated Regulations	☐ Provide information to the national access point ☐ Receive information from the national access point ☒ No connection to the national access point

Information provision to end users	☐ Web portal ☐ Phone app ☒ VMS ☐ In-vehicle information ☐ Other

IMPLEMENTATION ASPECTS	
Year of implementation (+ end date of measure if applicable)	2019
Technical description	The new system consists of the following main technical and functional features: ▪ identification of people and vehicles; ▪ video surveillance system for the supervision of the gate area; ▪ computerization aimed at the automation of the processes and procedures for entering and exiting the port, through a new software system, AGS – Automated Gate System, dedicated to the process logic and the management of access authorizations; ▪ development of a new ICT infrastructure based on the interoperability among the systems, via standard communication protocols and the exchange of XML messages and/or web services; ▪ main components of the overall system are: 1. Identification devices(RFID readers, barcode readers, alphanumeric keyboards), 2. vehicle detection sensors (inductive loops and laser scanners), 3. IP video phones, 4. LCD displays, 5. ANPR cameras, 6. Video surveillance cameras, 7. Variable message signs (VMS), 8. IT workstations for gate operators, 9. Dedicated IT infrastructure.
Lessons learnt / factor of success / topics considered as good practice (technical, legal, organisational, financial)	Being the port gateway a multipurpose environment, several solutions have been considered and assessed before the implementation of the AGS, hence the analysis has been carried out with multi sector approach (traffic, operations, ICT and users' driven). The action has foreseen the replacement of the magneto resistive sensors, that were too sensitive for the type of cargo going through the gate and that were once present at the "control blocks" of the entrance lanes and of the exit gates, with a pair of sensors consisting of inductive coils and laser scanner.
Impacts assessment / results (if available)	

ILLUSTRATIONS	
(please include image caption and source)	
	

REFERENCES	
Documentation available on the project	
Web link	www.port.venice.it

1.1.5.2 Bayerninfo – Traveller information service and System for collection and distribution of traffic information

GENERAL INFORMATION	
Name of service/system/project	Bayerninfo – Traveller information service and System for collection and distribution of traffic information
Name of operator/organisation	Bavarian Road Administration
Service delivery	☒ Public ☐ Private
Mainly applicable Deployment Guideline	TIS-DG07_Co-Modal Traveller Information

Other relevant Deployment Guideline(s)	TIS-DG02_Forecast And Real Time Event Information TIS-DG03_Travel Condition And Travel Time Information TIS-DG06_Weather Information FLS-DG01_Intelligent And Secure Truck Parking
Contact for more information	zvm@abdsb.bayern.de

GEOGRAPHICAL ASPECTS	
Country	Germany
Region of implementation	Bavaria
Corridor(s) or Network(s) concerned	Ursa Major; Information covers the TEN-T Network, but also the secondary, urban, public transport and bicycle network

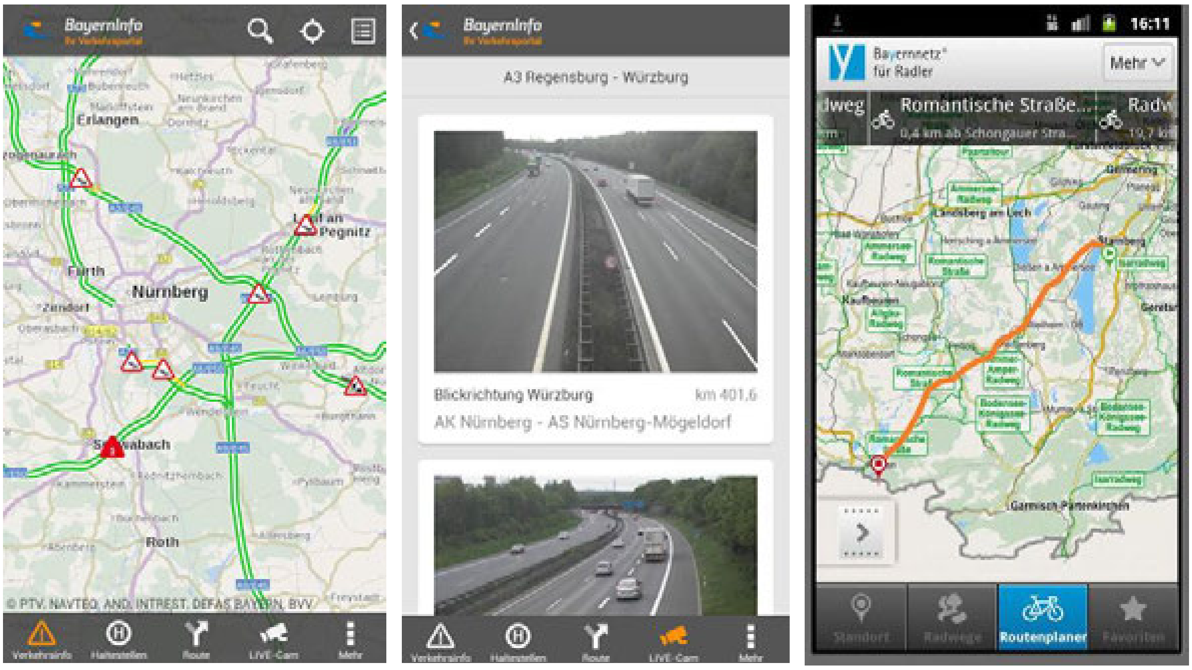
ITS SERVICE DESCRIPTION	
General Objectives	☒ Reduction of congestion ☒ Increase of safety ☒ Reduction of environmental damage ☐ Protection of the road infrastructure ☒ Increase traveller comfort ☐ Other
Specific Objectives	☒ Change the distribution in time of transport in order to achieve a more even allocation, avoiding peaks (access restrictions, fees) ☐ Change the distribution of transport in space in order to achieve a more even distribution on the network and prevent “wrong vehicles on wrong places” (traffic control, traffic management, traffic information, access restrictions) ☐ Change the composition of vehicles on a certain piece of infrastructure (access restrictions, fees) ☐ Manage the flow on a given road section in order to reduce speed variation and thus improve the capacity and reduce the risk of incidents ☐ Manage access to a given road section in order to prevent disturbances and reduce the risk of incidents (e.g. ramp metering) ☐ Increase the speed on the link and thus increase capacity (throughput) ☒ Reduce the risk of incidents and traffic disruptions through better informed infrastructure users (traffic and traveller information) ☐ Reduce the consequences from disruptions through fast countermeasures (incident response time) ☒ Reduce traffic volumes through redistributing transport between transport modes ☐ Other
Short narrative description of your best practice including e.g. geographical dimension, numbers, target group like HGV or passengers, costs etc.	The German State of Bavaria has been offering traveller and traffic information services since more than 15 years with different operating approaches. These services have been offered through the BayernInfo system. It covers the State of Bavaria, but shall be extended towards the neighboring regions. The target groups are all kinds of travelers on the Bavarian network including commuters, truck drivers, tourists and others.
Relation with national access point set up according to EC Delegated Regulations	☒ Provide information to the national access point ☐ Receive information from the national access point ☐ No connection to the national access point
Information provision to end users	☒ Web portal ☒ Phone app ☐ VMS ☒ In-vehicle information ☒ Other: Info booths on rest areas

IMPLEMENTATION ASPECTS	
Year of implementation (+ end date of measure if applicable)	1996 (first launch of the website)

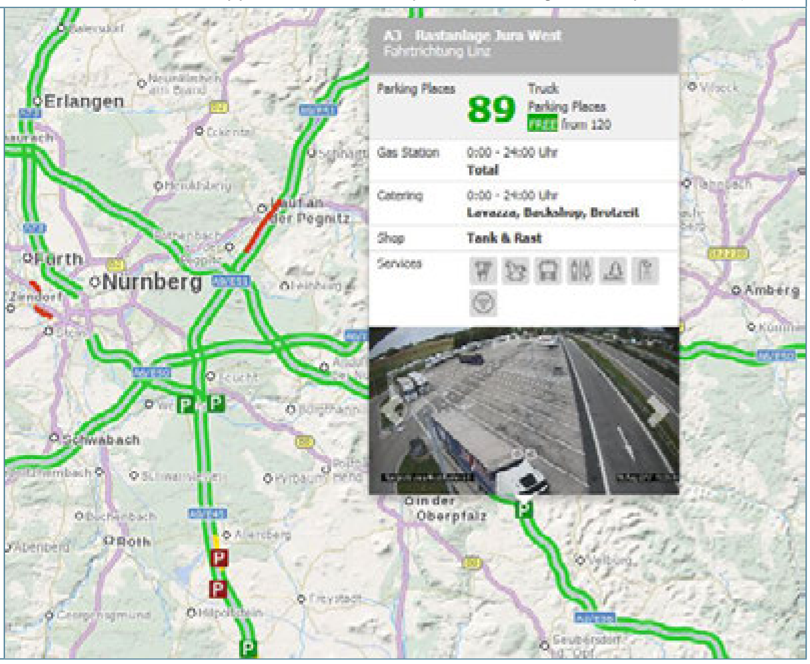
Technical description	The Bavarian Road Administration has built up an overall traffic information system for the State of Bavaria, where all data are being compiled and integrated. It consists of a content platform for road traffic data and messages, a public transport platform, a weather data platform, a webcam image server and a parking data center. The technical operation and data integration is assisted by a traffic editor, located in the TCC Munich. The complete system is based on the georeferencing system INTREST, which works with an enhanced commercial map. The system is equipped with several interfaces for data exchange, including DATEX2. It contributes to the German National Access Point, called Mobility data marketplace (MDM). Beyond offering services for the public and providing data to the MDM, BayernInfo is also integrated into the data chain for RDS-TMC and TPEG traffic messages. Additionally several internal services for the road administration (e.g. construction site management system, congestion statistics) are being fed by the BayernInfo system. The core services of the BayernInfo platform: ▪ a visualisation of the current traffic situation on all roads including a level-of-service using real-time data (probe data), construction sites and road closures, event information (trade fair, sports events), weather information (warnings for areas and specific road stretches) ▪ a multimodal route planner on basis of real-time traffic data and prognoses for road transport ▪ webcam images from the major roads ▪ paring information services ▪ parking information for passenger vehicles in major cities ▪ a bicycle route planner including information for bicycle tourists. Various partners contribute with data for the services: ▪ A private provider delivers real-time probe data ▪ The Traffic Control Centers provide sensor data regarding traffic load, truck parking and weather ▪ The Highway Directorates as well as local and communal road maintenance offices contribute with messages on road works and road closures ▪ The police provide data on accidents, congestions and other police messages ▪ The German Automobile Club provides parking data for passenger cars ▪ The Bavarian public transport agency BEG delivers data for the public transport including time-tables and real-time data (delays) ▪ The State Ministry for Economy is responsible for the collection of bicycle information.
Lessons learnt / factor of success / topics considered as good practice (technical, legal, organisational, financial)	The Bayerninfo system has been operated in a public-private-partnership approach 2006-2015 and is since being operated by public agencies again. It showed that a private operator cannot make enough profit with this kind of information. An operation by a public agency suits better for such a system in our experience.
Impacts assessment / results (if available)	

ILLUSTRATIONS

Web: road works info, weather info, congestion info, level-of-service and closed road on the secondary network



Mobile Application: Traffic map, webcam images, route planner for cyclists



Web: truck parking information

Information booth on a rest area	

REFERENCES	
Documentation available on the project	
Web link	www.bayerninfo.de

1.1.5.3 Traffic Information Portal Verkehr.NRW

GENERAL INFORMATION	
Name of service/system/project	Traffic Information Portal Verkehr.NRW
Name of operator/organisation	Landesbetrieb Strassenbau Nordrhein-Westfalen (Strassen.NRW)
Service delivery	☒ Public ☐ Private
Mainly applicable Deployment Guideline	TIS-DG07 Co-modal Traveller Information
Other relevant Deployment Guideline(s)	
Contact for more information	verkehrszentrale@strassen.nrw.de

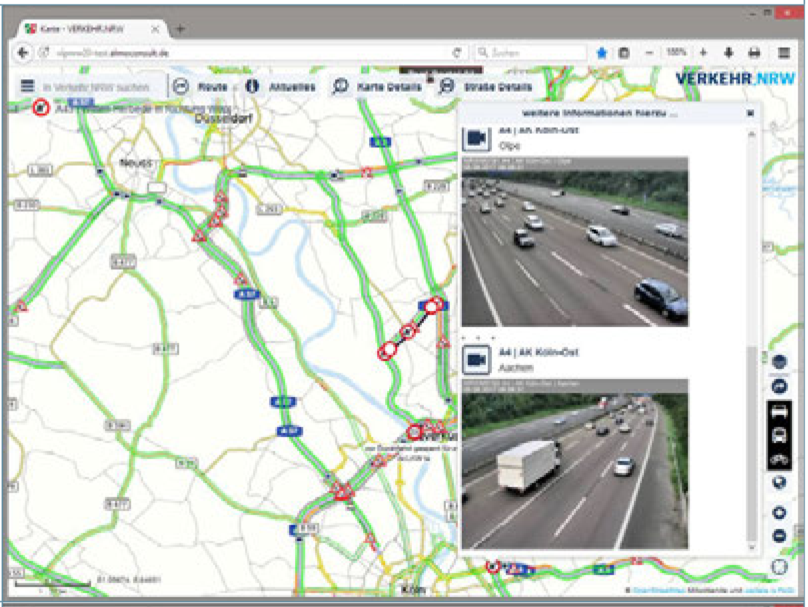
GEOGRAPHICAL ASPECTS	
Country	Germany
Region of implementation	North Rhine-Westphalia
Corridor(s) or Network(s) concerned	Rhine – Alpine, North Sea – Baltic

ITS SERVICE DESCRIPTION	
General Objectives	☐ Reduction of congestion ☐ Increase of safety ☐ Reduction of environmental damage ☐ Protection of the road infrastructure ☒ Increase traveller comfort ☐ Other

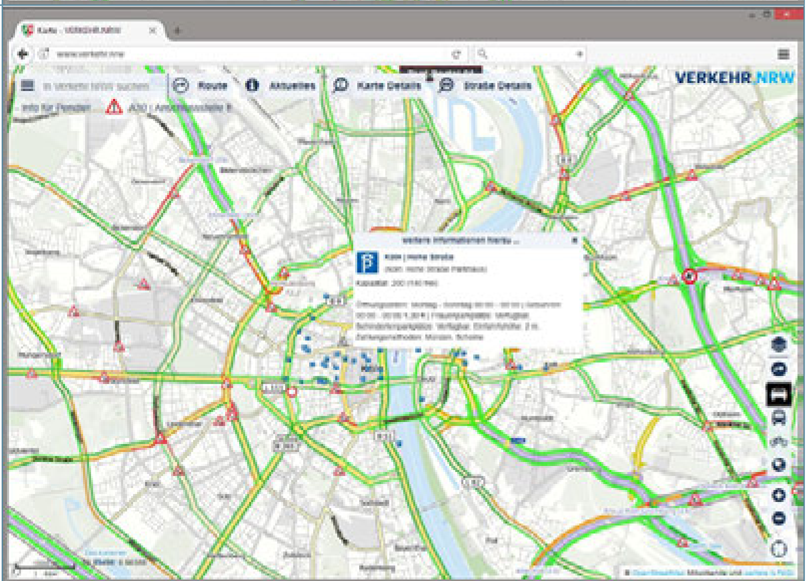
Specific Objectives	☒ Change the distribution in time of transport in order to achieve a more even allocation, avoiding peaks (access restrictions, fees) ☒ Change the distribution of transport in space in order to achieve a more even distribution on the network and prevent "wrong vehicles on wrong places" (traffic control, traffic management, traffic information, access restrictions) ☐ Change the composition of vehicles on a certain piece of infrastructure (access restrictions, fees) ☐ Manage the flow on a given road section in order to reduce speed variation and thus improve the capacity and reduce the risk of incidents ☐ Manage access to a given road section in order to prevent disturbances and reduce the risk of incidents (e.g. ramp metering) ☐ Increase the speed on the link and thus increase capacity (throughput) ☒ Reduce the risk of incidents and traffic disruptions through better informed infrastructure users (traffic and traveller information) ☐ Reduce the consequences from disruptions through fast countermeasures (incident response time) ☐ Reduce traffic volumes through redistributing transport between transport modes ☐ Other
Short narrative description of your best practice including e.g. geographical dimension, numbers, target group like HGV or passengers, costs etc.	So far, the traffic information portal covers following information: ▪ Car: road works, road closures, traffic warnings, current traffic condition on motorways and on urban streets in metropolitan regions, parking information in urban areas, live streams of traffic cams; ▪ Routing functions allow to select all traffic information on the user specific route. ▪ Bicycle: Routing functions shall offer an alternative to traveling by car or show the way to a railway station in case of multimodal trips by bike and railway. Results base on queries to bike portal with theme and bicycle routes and elevation profile. Deep links for further information are provided. ▪ Public transport: Routing functions shall offer an alternative to traveling by car. Results base on queries to EFA server of transport association VRR with timetables and current departure and arrival times. Users get local information based on Openstreetmap and can initiate requests to multimodal journey planner.
Relation with national access point set up according to EC Delegated Regulations	☐ Provide information to the national access point ☒ Receive information from the national access point ☐ No connection to the national access point
Information provision to end users	☒ Web portal ☒ Phone app ☐ VMS ☐ In-vehicle information ☐ Other

IMPLEMENTATION ASPECTS	
Year of implementation (+ end date of measure if applicable)	The traffic information portal has been in operation since September 2013.
Technical description	Road network related information is visualised based on an Openstreetmap with extension of an RDS-TMC reference. Original data coming from different sources are mostly received in DATEX II. Sources for those Strassen.NRW is responsible for, like road work information and video streams, use direct interfaces. Other data are received via the Mobility Data Marketplace (MDM). The journey planner including PT timetables has been realised by service interfaces to EFA server respectively to the bicycle route planner of North Rhine-Westphalia.
Lessons learnt / factor of success / topics considered as good practice (technical, legal, organisational, financial)	Verkehr.NRW offers independent, free of advertising and non-discriminatory access to traffic information. Desktop and mobile version have a common look and feel. Both are easy and intuitively to use. Commuters as well as occasional travellers get just the information they need when travelling in North Rhine-Westphalia be it by car, by public transport or by bike.
Impacts assessment / results (if available)	Verkehr.NRW has round about 500.000 users per month and 10 million hits per day (with rising tendency). Regularly, positive user feedback is received via existing communication channel of the portal.

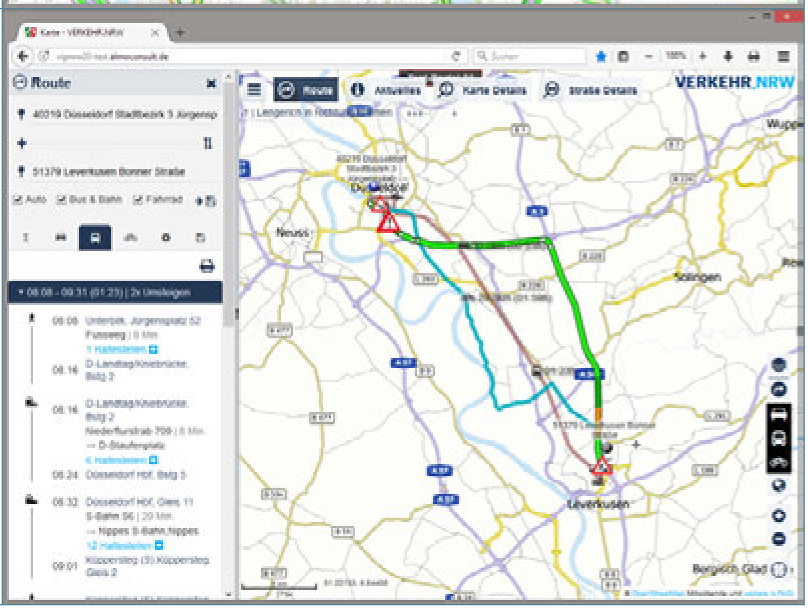
ILLUSTRATIONS



Verkehr.NRW: Motorway network with access to traffic cam pictures/streams as well as specific information about current traffic conditions, long/short term road works and road or exit/entry closures



Verkehr.NRW: Urban traffic information about road works, current traffic conditions and parking facilities



Verkehr.NRW: Result of a journey planning request for different modes (car, public transport and bicycle)

REFERENCES	
Documentation available on the project	GIS Best Practice Award: Preis für NRW-Verkehrsportal Strassen.NRW press release of 14 September 2015; https://www.land.nrw/de/pressemitteilung/gis-best-practice-award-preis-fuer-nrw-verkehrsportal-strassennrw Landesbetrieb Straßenbau NRW gewinnt den DVW GIS Best Practice Award 2015 – internet publication of 9 September 2015; http://www.dvw.de/aktuelles/18560/landesbetrieb-stra-enbau-nrw-gewinnt-den-dvw-gis-best-practice-award-2015 Sander, Klaus-Werner: Verkehr.NRW – das integrierte Verkehrsinformationsportal des Landes. In: zfv – Zeitschrift für Geodäsie, Geoinformation und Landmanagement, 1/2016, p. 59-63. Verkehrsportal von Strassen.NRW wurde überarbeitet – press release of 1 March 2017; https://www.strassen.nrw.de/presse/meldungen/2017/pi2017-2-1385.html
Web link	Verkehr.NRW

1.2
TMS - Traffic Management services

1.2 TMS - Traffic Management Services

1.2.1 TMS-01 Dynamic Lane Management

1.2.1.1 Dynamic Lane Managment on the Motorway A14

GENERAL INFORMATION	
Name of service/system/project	Dynamic Lane Management on the Motorway A14 Bologna – Bari – Taranto (known as “Adriatica”) between Km 8+400 (Intersection Casalecchio A1-A14) and Bologna S. Lazzaro (Km 22+231)
Name of operator/organisation	Autostrade per l’Italia
Service delivery	☐ Public ☒ Private
Mainly applicable Deployment Guideline	TMS-DG01
Other relevant Deployment Guideline(s)	
Contact for more information	Francesco Trallori francesco.trallori@autostrade.it

GEOGRAPHICAL ASPECTS	
Country	Italy
Region of implementation	Emilia Romagna
Corridor(s) or Network(s) concerned	Motorway A14 Bologna – Bari – Taranto

ITS SERVICE DESCRIPTION	
General Objectives	☒ Reduction of congestion ☐ Increase of safety ☐ Reduction of environmental damage ☐ Protection of the road infrastructure ☐ Increase traveller comfort ☒ Other: Modernisation and expansion
Specific Objectives	☐ Change the distribution in time of transport in order to achieve a more even allocation, avoiding peaks (access restrictions, fees) ☒ Change the distribution of transport in space in order to achieve a more even distribution on the network and prevent “wrong vehicles on wrong places” (traffic control, traffic management, traffic information, access restrictions) ☐ Change the composition of vehicles on a certain piece of infrastructure (access restrictions, fees) ☒ Manage the flow on a given road section in order to reduce speed variation and thus improve the capacity and reduce the risk of incidents ☐ Manage access to a given road section in order to prevent disturbances and reduce the risk of incidents (e.g. ramp metering) ☐ Increase the speed on the link and thus increase capacity (throughput) ☐ Reduce the risk of incidents and traffic disruptions through better informed infrastructure users (traffic and traveller information) ☐ Reduce the consequences from disruptions through fast countermeasures (incident response time) ☐ Reduce traffic volumes through redistributing transport between transport modes ☐ Other

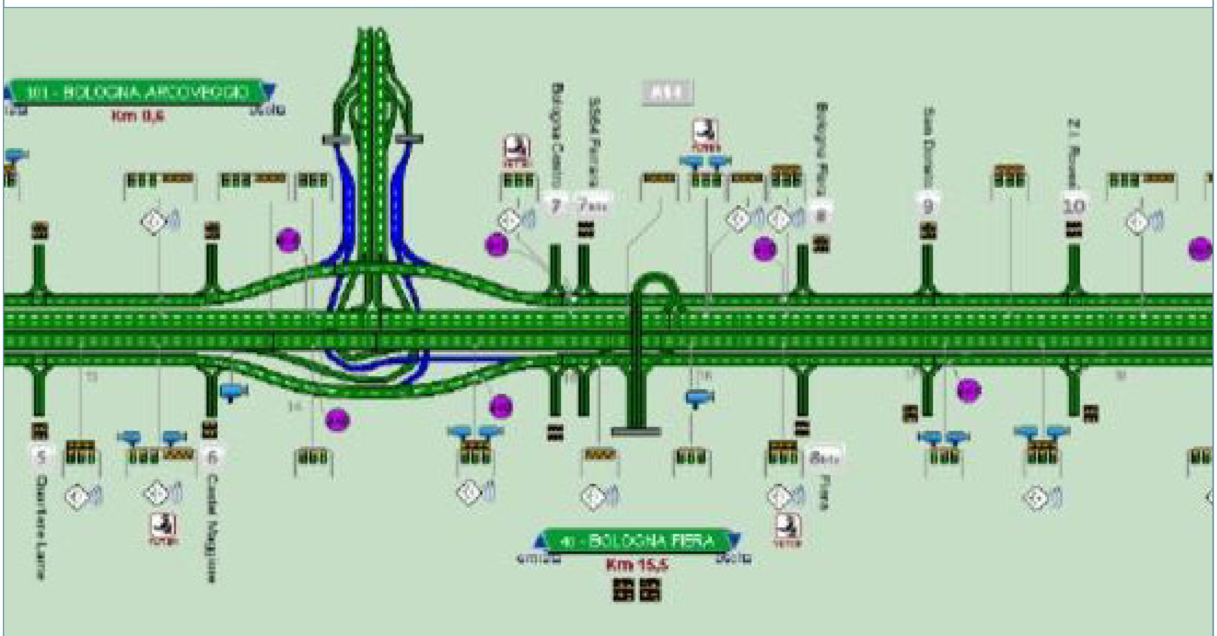
Short narrative description of your best practice including e.g. geographical dimension, numbers, target group like HGV or passengers, costs etc.	The dynamic lane is a part of the activities that have been performed for the Single Convention Motorways License between Autostrade per l'Italia and ANAS (Italian Public Road Authority), that in this specific case provided for the modernization and expansion of the Motorway A14 Bologna - Bari - Taranto. The route of the A14 describes a straight north - south along the Adriatic coast and connects Milan to Bologna and Taranto, then it represents one of the main national highway connections between South and North. In the first stretch between the Km 8+400 (Intersection Casalecchio A1-A14) and Bologna S. Lazzaro (Km 22+231), starting from an existing two lanes plus emergency (2L+1E) and because of the existence of a sub-urban ring belt all along the motorway section, it has not been impossible to enlarge the carriageway (2L+1E) to three lanes plus emergency lane (3L+1E) and as a consequences the project has focused on the opening of the emergency lane to the traffic by mean of transforming it in a dynamic lane and obtaining a configuration 2L+1L/E Dynamic. Beyond Bologna S. Lazzaro (Km 22+231) and up to Km 29+000 the final purpose is to enlarge the carriageway to a fixed configuration of 3L+1E without Dynamic, which represents a wider carriageway respect to the previous and already working section. Beyond the Km 29+000 and Km 56+600 (Ravenna) it is possible to expand to a configuration 4L+1E because of the inexistence of a sub urban road along the motorway and there will be no dynamic. The intervention of expansion to IV lane of A14 is located entirely in the territory of the Emilia Romagna region. The entire motorway section is divided into two provinces, respectively Bologna (equal to 92.6% of total development) and Ravenna (equal to 7.4%). Moving from Rimini to Bologna, the road section between Ravenna and Bologna San Lazzaro of the Motorway A14 Bologna - Taranto presents current levels of traffic ranging from about 88.500 vehicles per day to about 92.500 with an incidence of heavy vehicles in traffic of about 25%, which is higher than the national network average that is 23%. The current 3 lanes in each direction of travel are able to give to the system a transport capacity sufficient to provide more adequate answer to the request of mobility expressed by the territory, that has a significant component of short distances traffic due to the proximity of the capital and the current level of congestion characterizing the SS9 Via Emilia. The relationship between travel demand and the flow capacity of the supply system has, despite of high traffic volumes, conditions of service still acceptable.
Relation with national access point set up according to EC Delegated Regulations	☐ Provide information to the national access point ☐ Receive information from the national access point ☒ No connection to the national access point
Information provision to end users	☐ Web portal ☐ Phone app ☒ VMS ☐ In-vehicle information ☐ Other

IMPLEMENTATION ASPECTS	
Year of implementation (+ end date of measure if applicable)	January, 15 2008

Technical description	The chosen reference architecture is consistent with the analysis of the preliminary project, it is in line with experience in similar achievements and provides multi-level systems. Starting from the lowest level, which is from the road, we have: The first level is composed by peripheral devices connected to the relevant units or local units, using copper connections, coaxial cable or ad-hoc optical fibre depending on the specific needs. The second level is composed by "concentrator" devices or multifunctional MFO ("Multi-Functional Outstation") nodes, grouped (in terms of communications and functions) in sets of devices linked to the centre: so a hierarchical network is realized. These nodes of "concentration" will result in fibre optic infrastructure nodes realized by adopting technologies that enable transmission transport up to 1 GBps. The third level is composed by front-ends or centres for the individual subsystems; The fourth level is composed by the integrated system supervision center that allows management of the various subsystems. The various peripheral devices (Local Units) are grouped together and placed in appropriate local (shelters). The criterion for groupings and then locating the shelter is the portal LCS, so there will be a shelter at each LCS panel. The quantity of devices necessary to distinguish the different types of each subsystem is: Quantity AID (Automatic Incident Detection) n. 46, CCTV n. 24, RT Sensors (count of vehicles above ground) n. 84, RT Sensors Loop (count of vehicles underground) n. 4, VMS text (traffic information) n. 8, VMS pictograms n. 89 and Gantry for VMS (one direction) n. 15. In the illustrations the figure 8 "type of connections" provides a schematic diagram for the workstation type physical architecture, where all devices are located for the different subsystems. The working hypothesis is that each station is available for the access to the backbone via Ethernet switch-hubs. Units of local management of traffic sensors UL_RT, of VMS and LCS (UL_PMV), codec for video surveillance system and AID system analyzer are located inside the shelter. The diagram shows the types of connections assumed. The ULCT (Control Local Unit) software will be able to communicate with sensors and control center, to perform sensors and network diagnosis and to process the following data: a) Count of vehicles b) Distance between vehicles c) Speed of vehicles d) Vehicle Classification e) Vehicle length f) Employment% g) Traffic slowed h) Traffic stop Count of vehicles: Where "above ground" sensors are used, the error of vehicle count, for a section, for each lane or for each direction of travel must not exceed + / - 3%. Distance between two vehicles: The subsystem must detect the distance between vehicles in the control area of each sensor. Where above ground sensors are used, the error on the distance from the vehicle ahead, calculated for each class of vehicle, must not exceed + / - 5%. Speed of vehicles: The subsystem must detect the speed of vehicles in the control area of each sensor. Where above ground sensors are used, the error on the rate, calculated for each class of vehicle, must not exceed + / - 5%. Vehicle Classification: The processing software will be able to classify both the vehicle passing on each lane and those passing in each direction according to the following table: Speed Class I From 0 to 30 Km/h II From 30 to 50 Km/h III From 50 to 70 Km/h IV From 70 to 90 Km/h V From 90 to 110 Km/h VI Over 110 Km/h Length Class I From 0 to 2,5 m II From 2,5 to 5 m III From 5 to 7,5 m IV From 7,5 to 10 m V From 10 to 12,5m VI From 12,5 to 15m VII From 15 to 17,5 m VIII Over 17,5 m

	The error in assigning a vehicle to a class must not exceed 5%. The classification error will be calculated on a sample of 50 vehicles with the following formula: $E_{att} = \frac{/\text{Real vehicles of class} - \text{Vehicles assigned to the class}/}{\text{Real vehicles of the class}} * 100$ Slow Traffic: This condition is defined as an alarm if in a lane the traffic is moving with average speed below a predetermined threshold via software between 10 and 40 km/h for a defined minimum time via software between 10 and 180 seconds. Stopped traffic: This condition is defined as an alarm when a lane traffic is stationary or is moving with average speed below a predetermined threshold via software from 0 to 10 km/ h for a defined minimum time via software between 10 and 180 seconds.
Lessons learnt / factor of success / topics considered as good practice (technical, legal, organisational, financial)	
Impacts assessment / results (if available)	The infrastructure density context refers to the existing 2L+1E/L Dynamic between the Km 8+400 (Intersection Casalecchio A1-A14) and Bologna S. Lazzaro (Km 22+231) the density of gantries supporting all the ITS sub-system is 22 in one direction and the same quantity viceversa, reaching a total of 44. According to the length of 13.600 mt, we have a gantry every 618 mt, which allow the driver to be constantly updated about the functionality of the dynamic lane. The capillarity of the ITS systems is high enough to have a full monitoring of the motorway section and capable to deliver the necessary information to TCC operator in charge of managing promptly the opening or the closing of the lane.

ILLUSTRATIONS



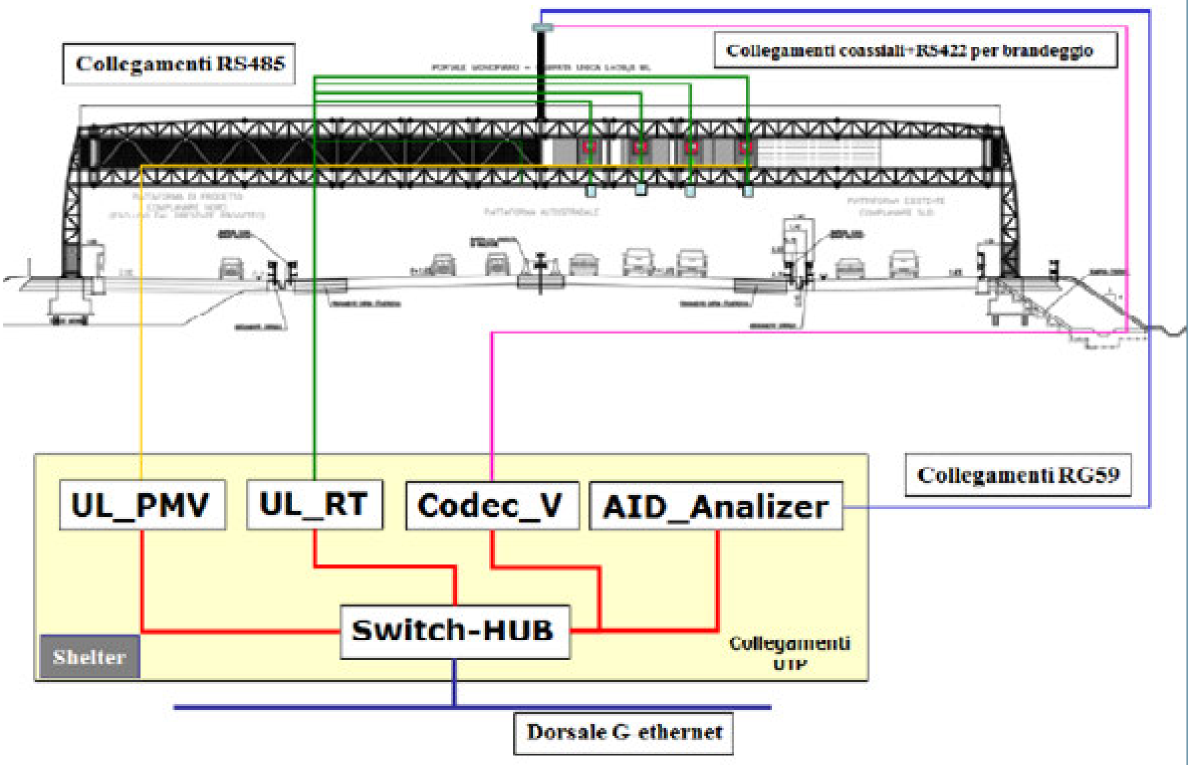


Figure 8: Type of connections

REFERENCES	
Documentation available on the project	
Web link	www.autostrade.it/it/home

1.2.2 TMS-02 Variable Speed Limits

1.2.2.1 Deployment of Variable Speed Limit systems on the VINCI Autoroutes motorway networks

GENERAL INFORMATION	
Name of service/system/project	Deployment of Variable Speed Limit systems on the VINCI Autoroutes motorway networks
Name of operator/organisation	VINCI Autoroutes
Service delivery	☒ Public ☐ Private
Mainly applicable Deployment Guideline	TMS-DG02 Variable Speed Limits
Other relevant Deployment Guideline(s)	
Contact for more information	Laurent BESSOU VINCI Autoroutes / ASF, France laurent.bessou@vinci-autoroutes.com

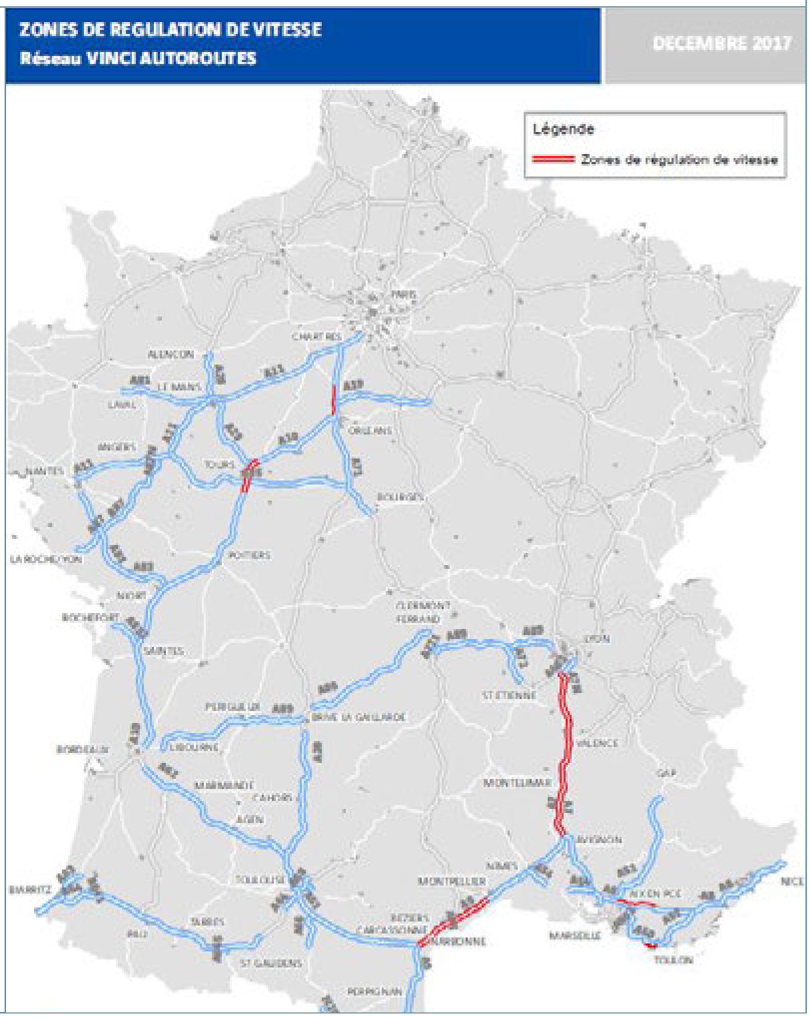
GEOGRAPHICAL ASPECTS	
Country	France
Region of implementation	French Southern motorways network
Corridor(s) or Network(s) concerned	Medtis and Arc Atlantique

ITS SERVICE DESCRIPTION	
General Objectives	☒ Reduction of congestion ☒ Increase of safety ☒ Reduction of environmental damage ☐ Protection of the road infrastructure ☒ Increase traveller comfort ☐ Other
Specific Objectives	☐ Change the distribution in time of transport in order to achieve a more even allocation, avoiding peaks (access restrictions, fees) ☒ Change the distribution of transport in space in order to achieve a more even distribution on the network and prevent "wrong vehicles on wrong places" (traffic control, traffic management, traffic information, access restrictions) ☐ Change the composition of vehicles on a certain piece of infrastructure (access restrictions, fees) ☒ Manage the flow on a given road section in order to reduce speed variation and thus improve the capacity and reduce the risk of incidents ☐ Manage access to a given road section in order to prevent disturbances and reduce the risk of incidents (e.g. ramp metering) ☐ Increase the speed on the link and thus increase capacity (throughput) ☒ Reduce the risk of incidents and traffic disruptions through better informed infrastructure users (traffic and traveller information) ☐ Reduce the consequences from disruptions through fast countermeasures (incident response time) ☐ Reduce traffic volumes through redistributing transport between transport modes ☐ Other
Short narrative description of your best practice including e.g. geographical dimension, numbers, target group like HGV or passengers, costs etc.	Variable speed limit systems have been deployed on the busiest sections of ASF, Escota and Cofiroute. These systems included mainline new software and VMS in order to ensure a 10-minute customer information frequency. In particular, the A7 and A9 motorways in France are two strategic corridors in Europe linking North to South. These interurban motorways are among the busiest in Europe and have the following characteristics: — high density of vehicles with peak periods (particularly in summer) reaching more than 100,000 vehicles/day on some sections — 20% of HGV and 30% of foreign drivers, — The traffic flow has constantly increased during the past years (+3% per year) leading to more disturbance for drivers and greater difficulty for ASF in managing daily traffic.
Relation with national access point set up according to EC Delegated Regulations	☒ Provide information to the national access point ☒ Receive information from the national access point ☐ No connection to the national access point
Information provision to end users	☒ Web portal ☒ Phone app ☒ VMS ☐ In-vehicle information ☐ Other

IMPLEMENTATION ASPECTS	
Year of implementation (+ end date of measure if applicable)	ASF has experimented and deployed since 2004 a variable speed limits systems which is now operational on several sections of the Vinci Network, cf map in illustrations.

Technical description	The solution set up by ASF is based on real-time systems allowing detection of traffic destabilisation 30 to 45 minutes in anticipation and the display of speed limits to drivers in order to adjust the traffic flow, thus contributing to a decrease in accident risks. The principle retained is a dynamic speed limits per level (110, 90 or 70 km/h) during periods of heavy traffic. The communication strategy has been determined in coordination with public authorities. The messages delivered via VMS on speed limits is mandatory. This deployment is only effective if the information is given to the whole network of concerned motorways. The user must have the speed limit information every 10 minutes. The aim is to complement measures of user information already available and deployed in other projects, that is to say increasing the frequency with which the user perceives the mandatory speed and informing new drive arriving in the area concerned. For this additional facilities of VMS are needed on the motorway and at each entrance. Every driver arriving in the area or already driving is rapidly aware of the restricted speed limit. The deployment is compliant with The Deployment Guidelines TMSDG02: Variable Speed Limits, version January 2012.
Lessons learnt / factor of success / topics considered as good practice (technical, legal, organisational, financial)	Transferability: Jointly with national road authorities' permission, others European motorway operators can realise such project. Before starting the deployment they must consider the great amount of equipment needed to ensure a good efficiency of the variable speed limit system.
Impacts assessment / results (if available)	The evaluation of the dynamic speed control system has shown some very good results in terms of impact on congestion and safety: — 25% reduction of accidents — 30% reduction of congestion — 85% of satisfied customers.

ILLUSTRATIONS



Speed regulation areas on the VINCI Motorways' network

REFERENCES	
Documentation available on the project	
Web link	

1.2.2.2 Dynamic Speed Control on the A13 West of Paris

GENERAL INFORMATION	
Name of service/system/project	DYNAMIC SPEED CONTROL ON THE A13 WEST OF PARIS
Name of operator/organisation	SAPN Motorway, Groupe Sanef
Service delivery	☒ Public ☐ Private
Mainly applicable Deployment Guideline	TMS-DG02 Variable Speed Limits
Other relevant Deployment Guideline(s)	
Contact for more information	Franck RIVEY, Groupe Sanef, Franck.RIVEY@Sanef.com

GEOGRAPHICAL ASPECTS	
Country	France
Region of implementation	West of Paris
Corridor(s) or Network(s) concerned	Arc Atlantique

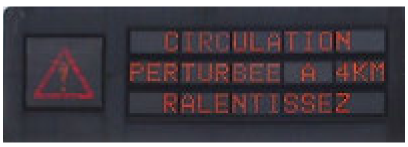
ITS SERVICE DESCRIPTION	
General Objectives	☒ Reduction of congestion ☒ Increase of safety ☒ Reduction of environmental damage ☐ Protection of the road infrastructure ☒ Increase traveller comfort ☐ Other

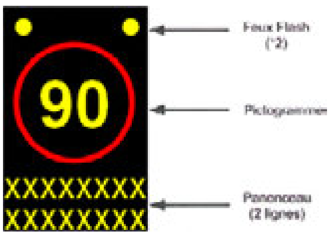
Specific Objectives	☐ Change the distribution in time of transport in order to achieve a more even allocation, avoiding peaks (access restrictions, fees) ☒ Change the distribution of transport in space in order to achieve a more even distribution on the network and prevent "wrong vehicles on wrong places" (traffic control, traffic management, traffic information, access restrictions) ☐ Change the composition of vehicles on a certain piece of infrastructure (access restrictions, fees) ☒ Manage the flow on a given road section in order to reduce speed variation and thus improve the capacity and reduce the risk of incidents ☐ Manage access to a given road section in order to prevent disturbances and reduce the risk of incidents (e.g. ramp metering) ☐ Increase the speed on the link and thus increase capacity (throughput) ☒ Reduce the risk of incidents and traffic disruptions through better informed infrastructure users (traffic and traveller information) ☐ Reduce the consequences from disruptions through fast countermeasures (incident response time) ☐ Reduce traffic volumes through redistributing transport between transport modes ☐ Other
Short narrative description of your best practice including e.g. geographical dimension, numbers, target group like HGV or passengers, costs etc.	The A13 motorway between Poissy and Mantes is a busy peri-urban motorway, carrying over 120,000 vehicles per day. The motorway operates at or near capacity during the morning and evening rush hours and during busy summer weekends and holidays. Approximately half of the congestion on the A13 motorway is concentrated within this 25 kilometre section. The A13 between Poissy and Mantes is well adapted to dynamic speed limits: ▪ vehicle demand approaches or exceeds capacity on a daily basis; ▪ the section has a relatively high accident rate which could be reduced through more constant vehicle speeds; and ▪ the motorway has a large volume of commuters and regular weekend drivers who will quickly become familiar with the scheme. The project area on the A13 covers the most heavily trafficked stretch of the motorway, with average daily flows twice that of the rest of the route. The section is toll-free and frequently congested carrying large volumes of daily commuter traffic travelling towards Paris and Poissy; freight traffic between the northwest ports and cities; and weekend traffic to and from the coast.
Relation with national access point set up according to EC Delegated Regulations	☒ Provide information to the national access point ☐ Receive information from the national access point ☐ No connection to the national access point
Information provision to end users	☐ Web portal ☐ Phone app ☒ VMS ☐ In-vehicle information ☐ Other

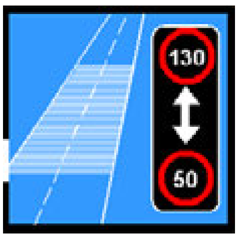
IMPLEMENTATION ASPECTS	
Year of implementation (+ end date of measure if applicable)	

Technical description	The dynamic speed limit zone is divided into sections where different speed limits can be applied depending on the traffic situation. The speed control system is an extension of SAPN's existing system of traffic management. The system has two main functions: ▪ Aid decision making The system continuously analyses traffic data, detecting changing conditions. When predefined thresholds are met (i.e. demand is nearing capacity) the system creates an alert for operators and proposes variable speed limits for the relevant sections. As traffic conditions change, the system proposes appropriate changes in speed limits to maintain continuous flow. When dynamic speed limits are no longer required, a phased return to the nominal speed limit is proposed. ▪ Implement the dynamic speed limit The mandatory dynamic speed limits are displayed on signs for drivers entering and driving through the project zone. Information is also disseminated to project partners (i.e. 107.7FM). Dynamic speed limits can be adapted or removed in circumstances when traffic priorities change, i.e. in the event of an incident The system is based on a two-stage algorithm ▪ Activation Stage Activation is based on measurement of flow and occupancy, with algorithm thresholds determined by the level of service. Optimum speed is calculated for each section. ▪ Control Stage Dynamic speeds limits are assigned to each road section, these are then analysed to ensure local constraints and regulations are met, if regulations are not met the speed limit instruction is changes or ignored. If the dynamic speed limits pass the control algorithm, they are transmitted to the control centre. The algorithm is highly adaptive, considering the local conditions on each section to minimise flow breakdown over the entire 25km of the dynamic speed limit zone. There are no preconfigured scenarios; different algorithms are applied in different conditions (i.e. peak hour traffic or weekend traffic).
Lessons learnt / factor of success / topics considered as good practice (technical, legal, organisational, financial)	Factor of success depends the great amount of equipment needed to ensure a good efficiency of the variable speed limit system. Three types of signs were used for this deployment: ▪ Fixed Signs Installed at the start of the dynamic speed limit zone and on slips roads leading onto the motorway, informing drivers that the speed limit may vary between 50 and 130kmph. ▪ Variable Message Signs Primarily used to display mandatory dynamic speed limits, but versatile and can display a range of pictograms (e.g. roadworks, hazards, accidents). Signs are installed in pairs (on the hard shoulder and central reservation) or on overhead gantries at 4km spacing. ▪ Information Signs Located on gantries upstream of the project area around Mantes, used to warn drivers of congestion ahead
Impacts assessment / results (if available)	Benefits recorded: ▪ Increased capacity ▪ Delayed onset of flow breakdown ▪ Smoother traffic flow and reduced CO_2 emissions ▪ Increased safety ▪ Reduced driver stress

ILLUSTRATIONS







REFERENCES	
Documentation available on the project	
Web link	

1.2.2.3 M20 J5-7 Variable Speed Limits

GENERAL INFORMATION	
Name of service/system/project	M20 J5-7 Variable Speed Limits
Name of operator/organisation	Highways England, United Kingdom
Service delivery	☒ Public ☐ Private
Mainly applicable Deployment Guideline	TMS-DG02 Variable Speed Limits
Other relevant Deployment Guideline(s)	
Contact for more information	Steve.narroway@highwaysengland.co.uk, info@highwaysengland.co.uk

GEOGRAPHICAL ASPECTS	
Country	United Kingdom
Region of implementation	South East England
Corridor(s) or Network(s) concerned	North Sea Mediterranean / Arc Atlantique ITS Corridor

ITS SERVICE DESCRIPTION	
General Objectives	☒ Reduction of congestion ☒ Increase of safety ☒ Reduction of environmental damage ☐ Protection of the road infrastructure ☐ Increase traveller comfort ☐ Other
Specific Objectives	☐ Change the distribution in time of transport in order to achieve a more even allocation, avoiding peaks (access restrictions, fees) ☒ Change the distribution of transport in space in order to achieve a more even distribution on the network and prevent "wrong vehicles on wrong places" (traffic control, traffic management, traffic information, access restrictions) ☐ Change the composition of vehicles on a certain piece of infrastructure (access restrictions, fees) ☒ Manage the flow on a given road section in order to reduce speed variation and thus improve the capacity and reduce the risk of incidents ☐ Manage access to a given road section in order to prevent disturbances and reduce the risk of incidents (e.g. ramp metering) ☐ Increase the speed on the link and thus increase capacity (throughput) ☐ Reduce the risk of incidents and traffic disruptions through better informed infrastructure users (traffic and traveller information) ☐ Reduce the consequences from disruptions through fast countermeasures (incident response time) ☐ Reduce traffic volumes through redistributing transport between transport modes ☐ Other
Short narrative description of your best practice including e.g. geographical dimension, numbers, target group like HGV or passengers, costs etc.	Deployment of a variable speed limit service principally to ease congestion on the M20, which is the main route through to the channel tunnel and ports. The length over which the service is deployed is approximately 5km. The target group is all eligible traffic that travels on this stretch of motorway which carries long distance traffic on the North Sea – Mediterranean CEF corridor / Arc Atlantique ITS Corridor, as well as significant local traffic using the route as a bypass to the major town of Mainstone.

Relation with national access point set up according to EC Delegated Regulations	☒ Provide information to the national access point ☐ Receive information from the national access point ☐ No connection to the national access point
Information provision to end users	☒ Web portal ☐ Phone app ☒ VMS ☐ In-vehicle information ☐ Other

IMPLEMENTATION ASPECTS

Year of implementation (+ end date of measure if applicable)	2011
Technical description	Installation of a series of gantries, civil engineering infrastructure and Advanced Matrix Indicators (AMI) The AMI's set speeds at 50mph during hours of peak congestion. Digital speed cameras enforce the temporary limits and speeding tickets are issued for non-compliance. Speeds are set using an advanced algorithm managed by the Regional Traffic Control Centre. The functional and technical requirements were developed by Highways England from specifications following an extensive research and design process involving multi-stakeholder consultation, testing and subsequent evaluation at a pilot site in the West Midlands. Look and feel accord with national perspectives that are in line with the Deployment Guidelines.
Lessons learnt / factor of success / topics considered as good practice (technical, legal, organisational, financial)	**Technical** The key challenge for Highways England was to develop an algorithm to determine the level of congestion at which lower speed limits should be set, the sequenced introduction of temporary limits, and the development of an indicator sign that is compliant with traffic signs regulations and allows enforcement of speed limits. **Institutional/organisational** The need for early engagement with Police Authorities to reach agreement to enforce the lower limits was a key challenge along with the need to provide of evidential quality data for enforcement. The requirement to educate road users in modes of operation and expectations of behaviours in response to changed limits as critical to its acceptance and eventual success. **Legal** The need to develop a Type Approved enforcement system to allow enforcement of the displayed speed limit on the Advance Indicator Sign in a court of law was a legal challenge to the designers of the systems.
Impacts assessment / results (if available)	The objectives for the scheme have been met. This scheme follows a similar project on the M25 J10-16 where it was proven that traffic congestion decreased, journey time reliability improved and environmental impact was ameliorated

ILLUSTRATIONS

REFERENCES	
Documentation available on the project	General descriptions of similar projects that use variable speed limits can be found at the web link below.
Web link	www.highways.gov.uk

1.2.2.4 Road weather controlled variable speed limits

GENERAL INFORMATION	
Name of service/system/project	Road weather controlled variable speed limits
Name of operator/organisation	Traffic Management Finland Group (state-owned company responsible for traffic management),
Service delivery	☒ Public ☐ Private
Mainly applicable Deployment Guideline	TMS-DG02 Variable Speed Limits
Other relevant Deployment Guideline(s)	
Contact for more information	General questions: Petri Antola, Finnish Transport Infrastructure Agency FTIA, petri.antola@vayla.fi Technical questions: Jarkko Johansson, Traffic Management Finland Group TMFG, jarkko.johansson@tmfg.fi

GEOGRAPHICAL ASPECTS	
Country	Finland
Region of implementation	Mainly south part of Finland
Corridor(s) or Network(s) concerned	E18, arterial main roads, peri-urban roads

ITS SERVICE DESCRIPTION	
General Objectives	☐ Reduction of congestion ☒ Increase of safety ☐ Reduction of environmental damage ☐ Protection of the road infrastructure ☐ Increase traveller comfort ☐ Other
Specific Objectives	☐ Change the distribution in time of transport in order to achieve a more even allocation, avoiding peaks (access restrictions, fees) ☐ Change the distribution of transport in space in order to achieve a more even distribution on the network and prevent “wrong vehicles on wrong places” (traffic control, traffic management, traffic information, access restrictions) ☐ Change the composition of vehicles on a certain piece of infrastructure (access restrictions, fees) ☐ Manage the flow on a given road section in order to reduce speed variation and thus improve the capacity and reduce the risk of incidents ☐ Manage access to a given road section in order to prevent disturbances and reduce the risk of incidents (e.g. ramp metering) ☐ Increase the speed on the link and thus increase capacity (throughput) ☐ Reduce the risk of incidents and traffic disruptions through better informed infrastructure users (traffic and traveller information) ☐ Reduce the consequences from disruptions through fast countermeasures (incident response time) ☐ Reduce traffic volumes through redistributing transport between transport modes ☒ Other: Reduce speeds to reduce risk of incidents when the weather or road conditions are hazardous (especially in winter)

Short narrative description of your best practice including e.g. geographical dimension, numbers, target group like HGV or passengers, costs etc.	To have harmonised criteria over different roads to adjust the variable speed limits according to the risk of incidents due to hazardous weather and road conditions
Relation with national access point set up according to EC Delegated Regulations	☒ Provide information to the national access point ☐ Receive information from the national access point ☐ No connection to the national access point
Information provision to end users	☐ Web portal ☐ Phone app ☒ VMS ☐ In-vehicle information ☒ Other: Variable speed limit signs

IMPLEMENTATION ASPECTS	
Year of implementation (+ end date of measure if applicable)	The implementation has been made section by section from end of the 1990's.
Technical description	The Variable Speed Limits system provides speed limits that are based on current weather and road conditions. Besides displaying speed limits with variable speed limit signs, the system also explains to drivers the reason for a lower speed limit making use of combinations of variable warning signs and variable text VMSs and in some case combinations of variable warning signs and variable speed limit signs. The road condition sections are carriageway specific and their length varies generally between 5 to 15 kilometres. The system receives input data from road condition section specific weather sensors and road condition sensors. The data includes, such as, air temperature, humidity, condensation point, state and intensity of rain, visibility and wind velocity plus the road surface condition: friction and temperature. The monitoring stations are placed at such locations along the road where the need for weather and road conditions information is highest and at specific locations where slippery situations frequently occur. In addition, there are road condition cameras along the road. The system carries out recommendation calculations and defines a road condition class (A, B, C or D, the conditions being best in class A) for each road section. The class and speed limit recommendation for a road condition section are defined according to the lowest condition class recommendation for the section. The speed limits and also warning sign messages applied in the various classes (typically 120, 100, 80 or 60km/h) are defined in the designs phase of the system/systems. The automatically calculated speed limit and control recommendations for variable warning signs and information VMSs are, depending on the system, either transmitted automatically as control commands to the roadside controllers of that road section, or the Control Centre Operator verifies the recommendations after which the commands are transmitted to the roadside equipment. In part of the systems, and as a goal for coming systems, control recommendations will be directly transmitted to the roadside equipment without supervision of the operator. In such case, the quality of the monitoring equipment must be very high and meet the requirements specified for them. In part of the systems, the control centre operator verifies the control recommendations in order to avoid inappropriate controls. When the operator notices a new recommendation on the centre user interface (s)he has to confirm that it meets the requirements of the current road condition section circumstances before accepting the control proposal. For confirmation, the operator has following tools: real-time video images of the section, real-time sensor data from the road weather stations, weather forecasts and weather radar images. In addition to road weather-based control, variable speed limits combined to variable warning signs and text are utilized in road maintenance, traffic disorder and accident situations. In urban areas variable speed limits and signs can be automatically controlled based on real time traffic volumes and average speeds.

<table>
<tr><td>Lessons learnt / factor of success / topics considered as good practice
(technical, legal, organisational, financial)</td><td>Based on several implementations and evaluation studies, we have learned a number of important lessons on weather-related variable speed limits:
1) The system works better and is more effective, when the dynamic speed limits are accompanied by information/warning signs indicating the reason of the possibly reduced speed limits.
2) The acceptance of the system is very high among the road users.
3) The impacts depend very much on the control principles, e.g. a safety oriented system reacting quickly to deteriorating road weather conditions and lowering the speed limit will have more accident reduction in comparison to systems, where the main objective is to maintain low travel times also during the winter season; Hence, the control principles are very important and should be carefully designed and harmonised, likely benefiting from a national policy related to them. The harmonisation is the keyword!
4) To improve the quality and benefits of the system, increasing of the automation level in the control is important as manual acceptance of control actions proposed by the system takes unnecessary time and may cause increased accident risks.
5) It is important that the speed limit value is reflecting the reactions of the driver, e.g. by not displaying too high a value in adverse weather and road surface conditions, where the majority of the drivers on a road would without the system use a lower speed.</td></tr>
<tr><td>Impacts assessment / results (if available)</td><td>The impacts of variable speed limits and road conditions warnings on annual level on the Finnish roads are (Tieliikenteen vaihtuvan ohjauksen palvelutasot, Liikenneviraston toimintalinjoja 1/2013):
<table>
<tr><td rowspan="2">Service</td><td colspan="4">Estimated annual impacts on equipped sections</td></tr>
<tr><td>Journey time</td><td>Accidents with injuries</td><td>CO_2 emissions</td><td>Other impacts</td></tr>
<tr><td>Variable speed limits</td><td>~0%</td><td>-6 … -10%</td><td>-0,2 … -0,5%</td><td>Comfort, manageability</td></tr>
<tr><td>Road condition warnings</td><td>~0%</td><td>-1 … -3%</td><td>~0%</td><td>Comfort, manageability</td></tr>
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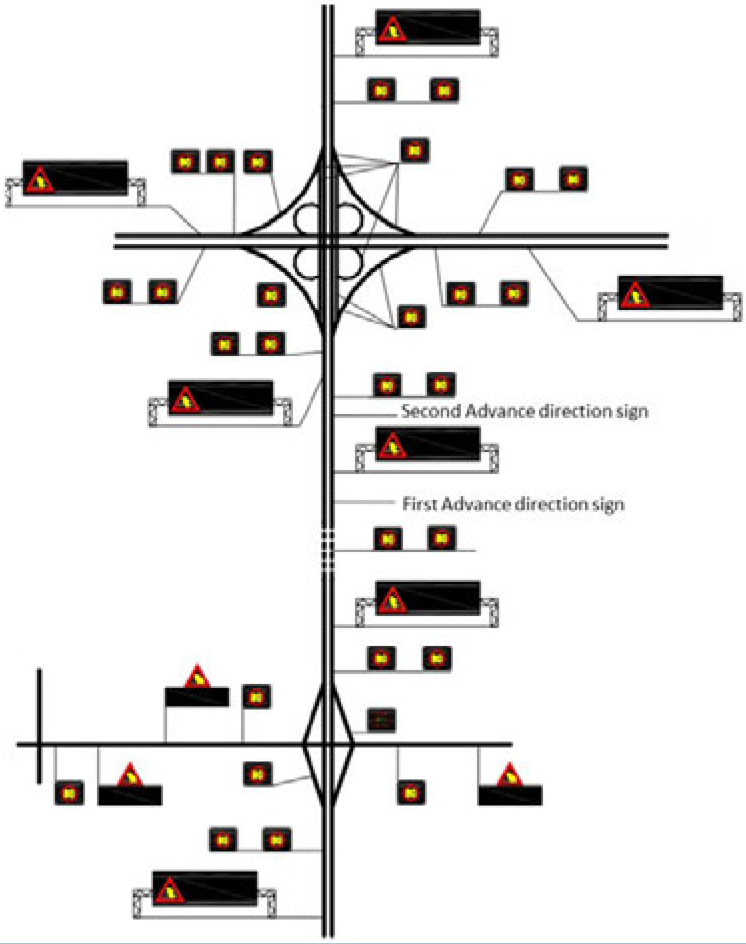
ILLUSTRATIONS	
	

REFERENCES	
Documentation available on the project	
Web link	

1.2.2.5 Strategic Routing and Virtual Traffic Control Systems

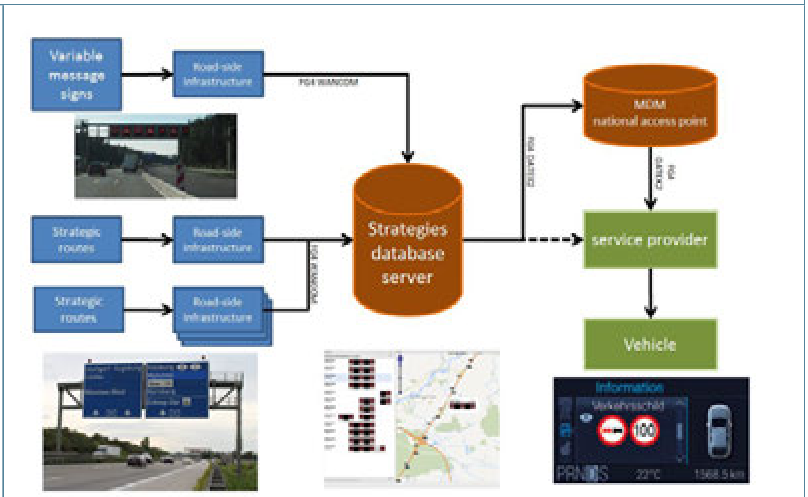
GENERAL INFORMATION	
Name of service/system/project	Strategic Routing and Virtual Traffic Control Systems
Name of operator/organisation	Bavarian Road Administration
Service delivery	☒ Public ☐ Private
Mainly applicable Deployment Guideline	TMS-DG02_Variable Speed Limits
Other relevant Deployment Guideline(s)	TIS-DG04_Speed Limit Information TMS-DG05_Incident Warning And Management TIS-DG06_Weather Information TMS-DG06_HGV Overtaking Ban TMS-DG07_Traffic Management Plan For Corridors And Networks
Contact for more information	zvm@abdsb.bayern.de

GEOGRAPHICAL ASPECTS	
Country	Germany
Region of implementation	Bavaria
Corridor(s) or Network(s) concerned	Ursa Major; Information covers the TEN-T Network

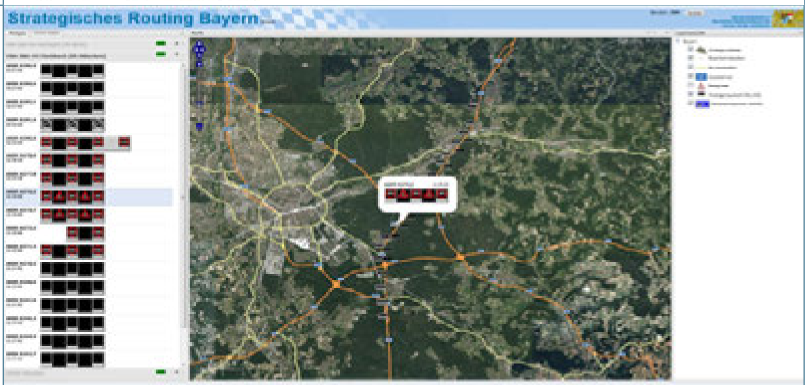
ITS SERVICE DESCRIPTION	
General Objectives	☒ Reduction of congestion ☒ Increase of safety ☒ Reduction of environmental damage ☐ Protection of the road infrastructure ☒ Increase traveller comfort ☐ Other
Specific Objectives	☐ Change the distribution in time of transport in order to achieve a more even allocation, avoiding peaks (access restrictions, fees) ☒ Change the distribution of transport in space in order to achieve a more even distribution on the network and prevent "wrong vehicles on wrong places" (traffic control, traffic management, traffic information, access restrictions) ☐ Change the composition of vehicles on a certain piece of infrastructure (access restrictions, fees) ☒ Manage the flow on a given road section in order to reduce speed variation and thus improve the capacity and reduce the risk of incidents ☐ Manage access to a given road section in order to prevent disturbances and reduce the risk of incidents (e.g. ramp metering) ☐ Increase the speed on the link and thus increase capacity (throughput) ☒ Reduce the risk of incidents and traffic disruptions through better informed infrastructure users (traffic and traveller information) ☐ Reduce the consequences from disruptions through fast countermeasures (incident response time) ☐ Reduce traffic volumes through redistributing transport between transport modes ☐ Other
Short narrative description of your best practice including e.g. geographical dimension, numbers, target group like HGV or passengers, costs etc.	Traffic control systems are wide-spread mean of traffic management. Current architectures of these systems however, often do not consider the communication to a service provider or a navigation system. Drivers will therefore often find inconsistent road sign information compared to what is displayed in their in car navigation system. This results in the fact that the compliance level of the information on the road sign is low. Previous projects have dealt with this problem in a research context, including a successful demonstration project at the Munich Allianz Arena. After the successful research phase, the Bavarian Road Administration has started to develop a long-term solution for unifying the content of variable message signs and traffic control systems with the content in car navigation devices. The system has been developed and tested within 2016. An extensive scientific support will be put in place to measure e.g. latency times.
Relation with national access point set up according to EC Delegated Regulations	☒ Provide information to the national access point ☐ Receive information from the national access point ☐ No connection to the national access point
Information provision to end users	☐ Web portal ☒ Phone app ☒ VMS ☒ In-vehicle information ☒ Other: in-vehicle representation of VMS

IMPLEMENTATION ASPECTS	
Year of implementation (+ end date of measure if applicable)	2016 (Strategies Database server operational)
Technical description	The basic idea about strategic routes is to communicate a route advice that is generated by infrastructure operators. Cities, road authorities and other infrastructure operators often spend much effort on creating traffic management plans and communicate them via variable message signs or web pages on the Internet. However, current navigation systems do not consider these strategies when calculating a route. Cooperation between the local authorities and the supplier of navigation services are of equal interest. A driver would benefit from the extra information supplied and would therefore be able to take the optimal route, calculated based on local knowledge and prediction. On the other hand, the local authorities would be able to have more influence on the drivers and divert more traffic according to their plans. The idea behind the "virtual" traffic control system is to communicate the information displayed on the variable message signs of traffic control systems to service providers or navigation systems. Although especially Information of variable speed limits can also be acquired by other means, e.g. in-vehicle cameras, however the communication between road operators and the navigation system directly is more reliable, faster (as it can be delivered to the driver before reaching the sign) and less error prone (in case of bad weather or other challenging situations). In 2015, the Bavarian Road Administration has decided to develop a solution for the problems of redirecting traffic and manipulating the traffic flow. The aim was to use the existing infrastructure in an operational context. Both use cases can be combined into one technical approach as they are based on the same technical infrastructure and communication channel within the two Bavarian Traffic Control Centers: a strategic database server collects all information in a central database that are displayed on variable message signs and traffic control systems. The information chain starts in the road-side sub-centers (UZ), which communicate with the Traffic Control Center (VRZ). Via the system integration tool (SI VRZ), the data is transmitted to the strategy database server. The data can also be transmitted through new Traffic Information Center of the Bavarian Road Administration (VIZ Bayern), which can be an option for the future. The data transferred included e.g. variable speed limits, congestion warning, overtaking bans, slippery road warnings and accident warnings. Within the server all data is stored in a common format. It then makes all data available through the German Mobility Data Marketplace (MDM) using the standard format DATEX II. The Bavarian server thus acts as an information broker. From the MDM, service providers can receive the data and use them for any service they offer. The Bavarian Road Administration itself will thus not act as a provider of services, but leave this role to the market.
Lessons learnt / factor of success / topics considered as good practice (technical, legal, organisational, financial)	The special value of this service lies in the support of the activities related to c2x-communication and the German Digital testbed A9 focusing on autonomous and connected driving. In addition the acceptance of collective traffic management measures is fostered. Especially regarding strategic routes, an improvement in the acceptance rate of the proposed routes due to an integration of strategic routing information into navigation systems, is expected. Considering the significant investments taken in the frame of the implementation of road-side gantries, the improvement of the acceptance rates can be deemed essential. Regarding variable speed limits also an improvement of the traffic safety can be expected by displaying the information not only on road sign, but also on the dashboard. When implementing such services, it is essential to supply additional meta-information in order to justify the strategy and put it in the right context. Only if a strategy is well justified it stands a chance to be considered in the routing, especially if it is in contradiction to other traffic information. Today's strategies are usually not linked to any corresponding traffic messages and therefore their context is often unclear.
Impacts assessment / results (if available)	An independent scientific partner has been chosen to check latency, jitter, package loss and data integration of the messages sent from the TCS to the vehicle. The latency average was tested with roughly 3 seconds from start to end.

ILLUSTRATIONS



System architecture



Visualisation in the Strategies DB server

Visualisation of the data in an OEM device

REFERENCES

Documentation available on the project	
Web link	

1.2.2.6 Variable Speed Limits on Motorring 3

GENERAL INFORMATION	
Name of service/system/project	Variable Speed Limits on Motorring 3
Name of operator/organisation	Vejdirektoratet
Service delivery	☒ Public ☐ Private
Mainly applicable Deployment Guideline	TMS DG02 Variable Speed Control
Other relevant Deployment Guideline(s)	
Contact for more information	Lars Tingleff, lti@vd.dk

GEOGRAPHICAL ASPECTS	
Country	Denmark
Region of implementation	Copenhagen
Corridor(s) or Network(s) concerned	Motorway, 14 numbers of kilometres

ITS SERVICE DESCRIPTION	
General Objectives	☒ Reduction of congestion ☒ Increase of safety ☐ Reduction of environmental damage ☐ Protection of the road infrastructure ☐ Increase traveller comfort ☐ Other
Specific Objectives	☐ Change the distribution in time of transport in order to achieve a more even allocation, avoiding peaks (access restrictions, fees) ☐ Change the distribution of transport in space in order to achieve a more even distribution on the network and prevent "wrong vehicles on wrong places" (traffic control, traffic management, traffic information, access restrictions) ☐ Change the composition of vehicles on a certain piece of infrastructure (access restrictions, fees) ☐ Manage the flow on a given road section in order to reduce speed variation and thus improve the capacity and reduce the risk of incidents ☐ Manage access to a given road section in order to prevent disturbances and reduce the risk of incidents (e.g. ramp metering) ☐ Increase the speed on the link and thus increase capacity (throughput) ☐ Reduce the risk of incidents and traffic disruptions through better informed infrastructure users (traffic and traveller information) ☐ Reduce the consequences from disruptions through fast countermeasures (incident response time) ☐ Reduce traffic volumes through redistributing transport between transport modes ☐ Other
Short narrative description of your best practice including e.g. geographical dimension, numbers, target group like HGV or passengers, costs etc.	On Motoring 3 around Copenhagen there is a motorway control system with following key applications ▪ Traffic detector system ▪ Variable speed limits (via variable speed signs, mandatory) ▪ Real time traffic information provided by VMS, e.g. incident warnings and travel times ▪ Video surveillance ▪ Web applications The Motorway control system was originally implemented as part of a large construction work in connection with the extension of the motorway from 2 to 3 lanes. The control system is still in use after the opening of the wider motorway
Relation with national access point set up according to EC Delegated Regulations	☐ Provide information to the national access point ☐ Receive information from the national access point ☐ No connection to the national access point

Information provision to end users	☒ Web portal ☐ Phone app ☒ VMS ☒ In-vehicle information ☐ Other

IMPLEMENTATION ASPECTS

Year of implementation (+ end date of measure if applicable)	2005
Technical description	
Lessons learnt / factor of success / topics considered as good practice (technical, legal, organisational, financial)	See below
Impacts assessment / results (if available)	**Driving Speeds** Investigations regarding travelling speeds have shown that the speed signs and variable message signs have led to a slight decrease in travelling speeds, the magnitude of which depends on what is shown on the variable signs (both speed limits and others) and the traffic conditions at hand. **Gaps between vehicles** The traffic management system in general causes the drivers to drive more closely to each other at speeds between 80 km/hour and 100 km/hour. Outside of this speed interval the time gaps have generally increased. **Accident statistics** The construction works did not lead to an increase in the number of traffic accidents taking place on the M3. This was one of the primary success criteria for the traffic management system. The safety impact of the Motorway Control System has not been evaluated after the opening of the wider motorway.

ILLUSTRATIONS

Figure NN: Speed control using variable message signs on Motorring 3 around Copenhagen

REFERENCES

Documentation available on the project	Title: Impacts of Traffic Management on Motorring 3, VIKING, 2007-04-03 Evaluation summary of "Effect of variable message signs on the Motorring 3"
Web link	

1.2.3 TMS-03 Ramp Metering

1.2.3.1 Highways England Ramp Metering

Name of service/system/project	Highways England Ramp Metering
Name of operator/organisation	Highways England, United Kingdom
Service delivery	☒ Public ☐ Private
Mainly applicable Deployment Guideline	TMS-DG03 Ramp Metering
Other relevant Deployment Guideline(s)	
Contact for more information	Steve.narroway@highwaysengland.co.uk, info@highwaysengland.co.uk

GEOGRAPHICAL ASPECTS	
Country	United Kingdom
Region of implementation	South East England
Corridor(s) or Network(s) concerned	North Sea Mediterranean / Arc Atlantique ITS Corridor

ITS SERVICE DESCRIPTION	
General Objectives	☒ Reduction of congestion ☒ Increase of safety ☒ Reduction of environmental damage ☐ Protection of the road infrastructure ☐ Increase traveller comfort ☐ Other
Specific Objectives	☐ Change the distribution in time of transport in order to achieve a more even allocation, avoiding peaks (access restrictions, fees) ☐ Change the distribution of transport in space in order to achieve a more even distribution on the network and prevent "wrong vehicles on wrong places" (traffic control, traffic management, traffic information, access restrictions) ☐ Change the composition of vehicles on a certain piece of infrastructure (access restrictions, fees) ☐ Manage the flow on a given road section in order to reduce speed variation and thus improve the capacity and reduce the risk of incidents ☒ Manage access to a given road section in order to prevent disturbances and reduce the risk of incidents (e.g. ramp metering) ☐ Increase the speed on the link and thus increase capacity (throughput) ☐ Reduce the risk of incidents and traffic disruptions through better informed infrastructure users (traffic and traveller information) ☐ Reduce the consequences from disruptions through fast countermeasures (incident response time) ☐ Reduce traffic volumes through redistributing transport between transport modes ☐ Other
Short narrative description of your best practice including e.g. geographical dimension, numbers, target group like HGV or passengers, costs etc.	Deployment of ramp meters on ramps at critical intersections of motorway network where modelling indicates control of traffic entering the motorway network will benefit the main line. The systems is aimed at all traffic intending to enter the motorway network at an intersection. The systems are deployed on ''on ramps' and operate at peak times.
Relation with national access point set up according to EC Delegated Regulations	☐ Provide information to the national access point ☐ Receive information from the national access point ☒ No connection to the national access point
Information provision to end users	☐ Web portal ☐ Phone app ☐ VMS ☐ In-vehicle information ☐ Other

IMPLEMENTATION ASPECTS	
Year of implementation (+ end date of measure if applicable)	2012
Technical description	Fixed warning signs are deployed ahead of the ramp. Traffic control is achieved using traffic signal heads with three aspects: Red, Ambre and Green. They have a similar appearance to standard traffic signals but have a yellow shield behind the lights. Signals are deployed on the near and off side carriageways. Flashing lights are not used. It is the responsibility of the Regional Traffic Control Centre to monitor performance of the network and adjust accordingly the signals using algorithms developed for the purpose. Signals are only used during peak times and when network capacity is restricted.
Lessons learnt / factor of success / topics considered as good practice (technical, legal, organisational, financial)	The functional and technical requirements were developed following a research project, pilot deployments and evaluation of results. The specifications were developed from existing technical specifications and best practice. Stakeholder sessions involving police and local authorities were key to successful implementation. Developing the control algorithm that successfully implements and controls ramp metering requires considerable development, testing and commissioning before the systems are proven for use.
Impacts assessment / results (if available)	Ramp metering systems have proven successful in certain locations where unregulated entry would trigger flow breakdown. Travel efficiency has improved (travel times have decreased and speeds increased). Further research is being undertaken.

ILLUSTRATIONS	
	To follow

REFERENCES	
Documentation available on the project	General descriptions of the services can be found at the web link below.
Web link	www.highways.gov.uk

1.2.3.2 Ramp Metering on Motorways in North Rhine-Westphalia

GENERAL INFORMATION	
Name of service/system/project	Ramp Metering on Motorways in North Rhine-Westphalia
Name of operator/organisation	Landesbetrieb Strassenbau Nordrhein-Westfalen (Strassen.NRW)
Service delivery	☒ Public ☐ Private
Mainly applicable Deployment Guideline	TMS-DG03 Ramp Metering
Other relevant Deployment Guideline(s)	
Contact for more information	verkehrszentrale@strassen.nrw.de

GEOGRAPHICAL ASPECTS	
Country	Germany
Region of implementation	North Rhine-Westphalia
Corridor(s) or Network(s) concerned	Rhine – Alpine, North Sea – Baltic

ITS SERVICE DESCRIPTION	
General Objectives	☒ Reduction of congestion ☒ Increase of safety ☐ Reduction of environmental damage ☐ Protection of the road infrastructure ☐ Increase traveller comfort ☒ Other: Smoothing of traffic flow on main carriageway, ease vehicles on the ramp the access to main carriageway
Specific Objectives	☐ Change the distribution in time of transport in order to achieve a more even allocation, avoiding peaks (access restrictions, fees) ☐ Change the distribution of transport in space in order to achieve a more even distribution on the network and prevent "wrong vehicles on wrong places" (traffic control, traffic management, traffic information, access restrictions) ☐ Change the composition of vehicles on a certain piece of infrastructure (access restrictions, fees) ☐ Manage the flow on a given road section in order to reduce speed variation and thus improve the capacity and reduce the risk of incidents ☒ Manage access to a given road section in order to prevent disturbances and reduce the risk of incidents (e.g. ramp metering) ☐ Increase the speed on the link and thus increase capacity (throughput) ☐ Reduce the risk of incidents and traffic disruptions through better informed infrastructure users (traffic and traveller information) ☐ Reduce the consequences from disruptions through fast countermeasures (incident response time) ☐ Reduce traffic volumes through redistributing transport between transport modes ☐ Other
Short narrative description of your best practice including e.g. geographical dimension, numbers, target group like HGV or passengers, costs etc.	First installations of ramp metering have been in operation in North Rhine-Westphalia since 1999. Positive impacts on traffic flow and increase of traffic safety are the main reasons for further realisation of numerous installations. Until now, there are nearly one hundred systems in operation. Main regions of this application are the Ruhr area and conurbations of Cologne (A1/A3), Krefeld (A57), Wuppertal (A46). Further 19 systems will be realised within the next years – among others at several junctions on motorways A3 and A57. Costs depend on local circumstances like available connection for power supply. In average, a single installation causes costs about 100.000 to 120.000 Euro.
Relation with national access point set up according to EC Delegated Regulations	☐ Provide information to the national access point ☐ Receive information from the national access point ☒ No connection to the national access point
Information provision to end users	☐ Web portal ☐ Phone app ☐ VMS ☐ In-vehicle information ☐ Other

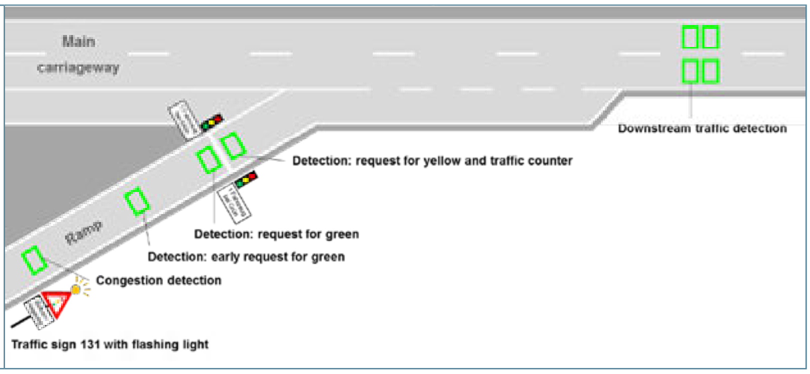
IMPLEMENTATION ASPECTS	
Year of implementation (+ end date of measure if applicable)	First implementation of ramp metering was realised in 1999.

Technical description	Based on downstream traffic flow detection the traffic lights will be activated in case of heavy traffic on main carriageway. To inform drivers about the active ramp metering, flashing lights in combination with traffic sign 131 will be activated as well at the beginning of the ramp. Cycle time is calculated by an ALINEA algorithm. To avoid queuing vehicles up to the beginning of the ramp appropriate detectors are implemented. Specific parameters are defined to shorten the red phase or even to deactivate the traffic lights. If applicable, the number of vehicles allowed to pass can be increased from one to two. But in practice, algorithms ensure deactivation of RM traffic lights only in cases of heavy congestion on main carriageway and queuing vehicles on the entering ramp up to the detector requesting yellow. (see illustration #3)
Lessons learnt / factor of success / topics considered as good practice (technical, legal, organisational, financial)	Main effect of ramp metering in highly frequented parts of the motorway network is fragmenting vehicle platoons on the ramp. This ensures traffic flow on main carriageway. The original ALINEA algorithm is often too strong to reach this aim and needs modification in order to shorten the red phase.
Impacts assessment / results (if available)	Evaluation studies confirm the effectiveness of implemented systems. Occurrence of gridlocks and duration of congestions have been notably reduced. The speed level on main carriageway during rush hours has been increased when systems are in operation.

ILLUSTRATIONS

Installation with dynamic message about number of vehicles allowed to access (motorway A4, junction Moitzfeld)

Installation on a ramp with two lanes (motorway A40, junction Essen Zentrum)

Principle of ramp metering installation in North Rhine-Westphalia with details of vehicle detection	

REFERENCES	
Documentation available on the project	Begleituntersuchung der Zuflussregelungsanlagen Essen-Frillendorf und Essen-Kray (A 40) – Zusammenfassung der Ergebnisse, Gutachten im Auftrag des Landesbetriebs Strassenbau NRW, April 2004. Begleituntersuchung der Zuflussregelungsanlage Köln-Dellbrück Fahrtrichtung Nord (A 3) – Zusammenfassung der Ergebnisse, Gutachten im Auftrag des Landesbetriebs Strassenbau NRW, Dezember 2003.
Web link	

1.2.4 TMS-04 Hard Shoulder Running

1.2.4.1 Hard Shoulder Running and Line Control – Frankfurt

Name of service/system/project	Hard Shoulder Running and Line Control - Frankfurt
Name of operator/organisation	Verkehrszentrale Hessen (Traffic Centre Hessen, VZH)
Service delivery	☒ Public ☐ Private
Mainly applicable Deployment Guideline	TMS-DG04_Hard Shoulder Running
Other relevant Deployment Guideline(s)	TMS-DG01_Dynamic Lane Management TMS-DG02_Variable Speed Limits TMS-DG05-08_Incident Warning and Management, TMS-DG06_HGV Overtaking Ban
Contact for more information	www.mobil.hessen.de/kontakt

GEOGRAPHICAL ASPECTS	
Country	Germany
Region of implementation	Frankfurt
Corridor(s) or Network(s) concerned	URSA MAJOR 2

ITS SERVICE DESCRIPTION	
General Objectives	☒ Reduction of congestion ☒ Increase of safety ☒ Reduction of environmental damage ☐ Protection of the road infrastructure ☐ Increase traveller comfort ☒ Other: Harmonisation of traffic flow

Specific Objectives	☐ Change the distribution in time of transport in order to achieve a more even allocation, avoiding peaks (access restrictions, fees) ☐ Change the distribution of transport in space in order to achieve a more even distribution on the network and prevent "wrong vehicles on wrong places" (traffic control, traffic management, traffic information, access restrictions) ☐ Change the composition of vehicles on a certain piece of infrastructure (access restrictions, fees) ☒ Manage the flow on a given road section in order to reduce speed variation and thus improve the capacity and reduce the risk of incidents ☐ Manage access to a given road section in order to prevent disturbances and reduce the risk of incidents (e.g. ramp metering) ☐ Increase the speed on the link and thus increase capacity (throughput) ☐ Reduce the risk of incidents and traffic disruptions through better informed infrastructure users (traffic and traveller information) ☐ Reduce the consequences from disruptions through fast countermeasures (incident response time) ☐ Reduce traffic volumes through redistributing transport between transport modes ☒ Other: Reduce variation in speed to harmonise traffic flow
Short narrative description of your best practice including e.g. geographical dimension, numbers, target group like HGV or passengers, costs etc.	Hessen with the Rhein-Main-Area is a key hub for long-distance-traffic, including the North-South-relation. The motorway A3 and A5 are the most important links. The temporary opening of hard shoulder as additional lane improves the conditions for better traffic flow and safety at these important links for all road users. Currently over 90km of HSR are in operation in Hessen, e.g. A3 south of Frankfurt interchange (Hessen) and A5 between Friedberg and Northwest interchange Frankfurt (Hessen). In future, 340 km HSR should be implemented in total.
Relation with national access point set up according to EC Delegated Regulations	☐ Provide information to the national access point ☐ Receive information from the national access point ☒ No connection to the national access point
Information provision to end users	☐ Web portal ☐ Phone app ☒ VMS ☐ In-vehicle information ☐ Other

IMPLEMENTATION ASPECTS	
Year of implementation (+ end date of measure if applicable)	
Technical description	In Hessen the temporary hard shoulder running is usually connected with a line control system. The control is carried out via corresponding sub- and video centres, which are connected to the traffic control centre Hessen. Video cameras, installed along the whole section, check whether the hard shoulder is free of broken down vehicles, objects or other obstacles. The approval by the staff in the TCC is repeated both directly before and after the release in regular intervals. This enables the immediate annulation of the release in case of, e.g. a breakdown. Outside the peak hours the hard should remain blocked for flowing traffic.
Lessons learnt / factor of success / topics considered as good practice (technical, legal, organisational, financial)	
Impacts assessment / results (if available)	

ILLUSTRATIONS

HSR in Hessen

Line control with integrated HSR in operation (A3 Limburg)

Line control with integrated HSR in operation

Line control with integrated HSR in operation

REFERENCES

Documentation available on the project	
Web link	

1.2.4.2 Highways England Hard Shoulder Running

GENERAL INFORMATION	
Name of service/system/project	Highways England Hard Shoulder Running
Name of operator/organisation	Highways England, United Kingdom
Service delivery	☒ Public ☐ Private
Mainly applicable Deployment Guideline	TMS-DG04 Hard Shoulder Running
Other relevant Deployment Guideline(s)	TMS-DG02 Variable Speed Limits
Contact for more information	Steve.narroway@highwaysengland.co.uk, info@highwaysengland.co.uk

GEOGRAPHICAL ASPECTS	
Country	United Kingdom
Region of implementation	West Midlands England
Corridor(s) or Network(s) concerned	North Sea Mediterranean / Arc Atlantique ITS Corridor

ITS SERVICE DESCRIPTION	
General Objectives	☒ Reduction of congestion ☒ Increase of safety ☒ Reduction of environmental damage ☐ Protection of the road infrastructure ☐ Increase traveller comfort ☐ Other
Specific Objectives	☐ Change the distribution in time of transport in order to achieve a more even allocation, avoiding peaks (access restrictions, fees) ☒ Change the distribution of transport in space in order to achieve a more even distribution on the network and prevent “wrong vehicles on wrong places” (traffic control, traffic management, traffic information, access restrictions) ☐ Change the composition of vehicles on a certain piece of infrastructure (access restrictions, fees) ☒ Manage the flow on a given road section in order to reduce speed variation and thus improve the capacity and reduce the risk of incidents ☐ Manage access to a given road section in order to prevent disturbances and reduce the risk of incidents (e.g. ramp metering) ☒ Increase the speed on the link and thus increase capacity (throughput) ☐ Reduce the risk of incidents and traffic disruptions through better informed infrastructure users (traffic and traveller information) ☐ Reduce the consequences from disruptions through fast countermeasures (incident response time) ☐ Reduce traffic volumes through redistributing transport between transport modes ☐ Other
Short narrative description of your best practice including e.g. geographical dimension, numbers, target group like HGV or passengers, costs etc.	Hard Shoulder Running has been deployed to ease congestion, improve journey time reliability and increase available capacity. Advanced Matrix Indicators (AMI) set lane speeds and open hard shoulders at peak times when capacity is restricted. Digital speed cameras enforce temporary speed limits. Hard Shoulders are opened using a set of agreed operating guidelines supported by an advanced algorithm and managed by the Regional Traffic Control Centre. This scheme is deployed on the M42 J3A -7 Birmingham, that is part of the Birmingham box.
Relation with national access point set up according to EC Delegated Regulations	☒ Provide information to the national access point ☐ Receive information from the national access point ☐ No connection to the national access point

Information provision to end users	☒ Web portal ☐ Phone app ☒ VMS ☐ In-vehicle information ☐ Other

IMPLEMENTATION ASPECTS	
Year of implementation (+ end date of measure if applicable)	2012
Technical description	Provision of gantries at 500m spacing with Advanced Matrix Indicators (AMI) over each lane provide enforceable speed limits when speed limits are varied down to 50mph. A separate variable message sign at each gantry allows traffic and travel information to be presented to road users. Traffic monitoring for traffic flow and congestion as well as safety is achieved by comprehensive deployment of CCTV cameras and loop detectors. These are supplemented by above ground detectors. Emergency refuge areas for use when hard shoulders are used for running are provided at up to 1km spacing, complete with CCTV and emergency telephones.
Lessons learnt / factor of success / topics considered as good practice (technical, legal, organisational, financial)	Technical lessons learned – 1) Time required to develop the algorithm to determine the level of congestion at which lower speed limits should be set and hard shoulders opened, 2) the operational sequencing for the implementation of temporary speed limits to maintain safety, and 3) the time required for the developmental processes for an indicator sign that is compliant with traffic signs regulations that allows legal enforcement of the changed speed limit. The scheme design needs to have been through a robust safety assessment which ensures the service operates without compromising safety levels. Operational lessons included the need to engage with highways operations, police authorities and road users to develop and agree safe operational regimes. The need to increase the level of complexity of operational regimes over a period of time using a phased introduction rather than a 'big bang' approach. The need to actively communicate and educate road users during introduction of alternative approach to road use.
Impacts assessment / results (if available)	Description of impacts - This scheme delivered a 7-9% increase in capacity, journey time reliability increased by up to 25%. Speed compliance was in access of 94%. There was an approximate 50% reduction in monthly personal injury accident rate.

ILLUSTRATIONS	
	To follow

REFERENCES	
Documentation available on the project	General descriptions of the services can be found at the web link below.
Web link	www.highways.gov.uk

1.2.4.3 Temporary release of hard shoulder assisted by automatic video detection

GENERAL INFORMATION	
Name of service/system/project	Temporary release of hard shoulder assisted by automatic video detection
Name of operator/organisation	Bavarian Road Administration
Service delivery	☒ Public ☐ Private
Mainly applicable Deployment Guideline	Hard Shoulder Running TMS-DG 04
Other relevant Deployment Guideline(s)	
Contact for more information	poststelle@abdsb.bayern.de

GEOGRAPHICAL ASPECTS	
Country	Germany
Region of implementation	Bavaria
Corridor(s) or Network(s) concerned	Ursa Major

ITS SERVICE DESCRIPTION	
General Objectives	☒ Reduction of congestion ☒ Increase of safety ☐ Reduction of environmental damage ☐ Protection of the road infrastructure ☐ Increase traveller comfort ☐ Other
Specific Objectives	☐ Change the distribution in time of transport in order to achieve a more even allocation, avoiding peaks (access restrictions, fees) ☐ Change the distribution of transport in space in order to achieve a more even distribution on the network and prevent “wrong vehicles on wrong places” (traffic control, traffic management, traffic information, access restrictions) ☐ Change the composition of vehicles on a certain piece of infrastructure (access restrictions, fees) ☒ Manage the flow on a given road section in order to reduce speed variation and thus improve the capacity and reduce the risk of incidents ☐ Manage access to a given road section in order to prevent disturbances and reduce the risk of incidents (e.g. ramp metering) ☒ Increase the speed on the link and thus increase capacity (throughput) ☐ Reduce the risk of incidents and traffic disruptions through better informed infrastructure users (traffic and traveller information) ☐ Reduce the consequences from disruptions through fast countermeasures (incident response time) ☐ Reduce traffic volumes through redistributing transport between transport modes ☐ Other
Short narrative description of your best practice including e.g. geographical dimension, numbers, target group like HGV or passengers, costs etc.	Between the Autobahn interchange Holledau and the Autobahn interchange Neufahrn the A9’s hard shoulder can be temporarily released to increase the capacity of the road. The releasing process is assisted by automatic video detection. Sections already checked by the operator are continuously reviewed by the automatic video detection system until the whole sector is released. In the meantime, the video system is on the lookout for disturbances like broken-down cars, traffic jams or wrong-way driving vehicles.
Relation with national access point set up according to EC Delegated Regulations	☒ Provide information to the national access point ☐ Receive information from the national access point ☐ No connection to the national access point
Information provision to end users	☐ Web portal ☐ Phone app ☒ VMS ☐ In-vehicle information ☐ Other

IMPLEMENTATION ASPECTS	
Year of implementation (+ end date of measure if applicable)	2010 - 2018
Technical description	Roadside and overhead road signs are used to temporarily release the hard shoulder. As soon as the detected traffic (51 observation points) reaches a certain level, the system control informs the operator of the potential to release the hard shoulder. The operator inspects the full length of the road section by video to ensure that the hard shoulder is free to release. To this end, there are video sequences stored in the video control system and the whole section of the hard shoulder is shown to the operator in a row automatically. The video control system monitors in the background the sectors that have already been checked by the operator. After the operator has inspected the whole section, the video control system notifies of detected disturbances.

Lessons learnt / factor of success / topics considered as good practice (technical, legal, organisational, financial)	It is not possible to substitute the operators completely by video detection. Each approach has specific advantages and strengths The emergency bays need traffic signs prohibiting parking at any time, otherwise truck drivers use them to rest. In this case the hard shoulder must not be released. There is a need to describe exactly how to embed the video detection in the process of releasing the hard shoulder. Furthermore, the accuracy of the video detection needs to be defined. The gantries are constructed of spun concrete, except the ones with higher span wide, which are constructed of steel. The road signs use LED technology. The video system consists of 159 colour cameras with zoom and 360 degrees rotating capabilities. The road needs to be equipped with emergency bays every 1500 m and additional exit and merging lanes at every interchange.
Impacts assessment / results (if available)	The system increases the road capacity and safety. It's well adopted especially by truck drivers. The release of the hard shoulder is less adopted on weekends with less commercial heavy good vehicles.

ILLUSTRATIONS

REFERENCES

Documentation available on the project	
Web link	www.abdsb.bayern.de

1.2.5 TMS-05 HGV Overtaking Ban

1.2.5.1 HGV Overtaking Ban German leaflet for the equipment of traffic control centers

Name of service/system/project	HGV Overtaking Ban ¬ German leaflet for the equipment of traffic control centers ¬
Name of operator/organisation	
Service delivery	☒ Public ☐ Private
Mainly applicable Deployment Guideline	TMS-DG06 ¬HGV OVERTAKING BAN
Other relevant Deployment Guideline(s)	
Contact for more information	reiff@bast.de

GEOGRAPHICAL ASPECTS	
Country	Germany
Region of implementation	
Corridor(s) or Network(s) concerned	

ITS SERVICE DESCRIPTION	
General Objectives	☒ Reduction of congestion ☒ Increase of safety ☐ Reduction of environmental damage ☐ Protection of the road infrastructure ☐ Increase traveller comfort ☐ Other
Specific Objectives	☐ Change the distribution in time of transport in order to achieve a more even allocation, avoiding peaks (access restrictions, fees) ☒ Change the distribution of transport in space in order to achieve a more even distribution on the network and prevent “wrong vehicles on wrong places” (traffic control, traffic management, traffic information, access restrictions) ☒ Change the composition of vehicles on a certain piece of infrastructure (access restrictions, fees) ☒ Manage the flow on a given road section in order to reduce speed variation and thus improve the capacity and reduce the risk of incidents ☐ Manage access to a given road section in order to prevent disturbances and reduce the risk of incidents (e.g. ramp metering) ☐ Increase the speed on the link and thus increase capacity (throughput) ☐ Reduce the risk of incidents and traffic disruptions through better informed infrastructure users (traffic and traveller information) ☐ Reduce the consequences from disruptions through fast countermeasures (incident response time) ☐ Reduce traffic volumes through redistributing transport between transport modes ☐ Other
Short narrative description of your best practice including e.g. geographical dimension, numbers, target group like HGV or passengers, costs etc.	As a harmonization activity, a overtaking ban for HGV over 7,5 t is mandated depending on the traffic flow and the HGV share under consideration of the whole section via variable message signs.
Relation with national access point set up according to EC Delegated Regulations	☐ Provide information to the national access point ☐ Receive information from the national access point ☒ No connection to the national access point
Information provision to end users	☐ Web portal ☐ Phone app ☒ VMS ☐ In-vehicle information ☐ Other

IMPLEMENTATION ASPECTS	
Year of implementation (+ end date of measure if applicable)	2018
Technical description	**Input parameters:** $Q_{V,S\ (i)}$ = smoothened vehicle flow [vehicle/h] S_{HGV} = HGV Share [%] $Q_{Truck,S}$ = smoothened HGV flow [HGV/h] **Triggering and redemption conditions:**

	Requirements		
Activation	$(Q_{V,S}(i) \geq Q_{OB,on})$ $(S_{HGV}(i) \geq S_{OB,on}(i))$		
Deactivation	$(Q_{V,S}(i) \leq Q_{OB,off})$ $(S_{HGV}(i) < S_{OB,off}(i))$		
	2 x 2 lane	**2 x 3 lane**	**2 x 4 lane**
$\mathbf{Q_{OB,on}}$	3200 [vehicle/h]	4000 [vehicle/h]	4400 [vehicle/h]
$\mathbf{S_{OB,on}}$	25 %	20 %	20 %
$\mathbf{Q_{OB,off}}$	2900 [vehicle/h]	3600 [vehicle/h]	3900 [vehicle/h]
$\mathbf{S_{OB,off}}$	15 %	10 %	10 %

Triggering conditions during wet road or limited visibility conditions:
$Q_{OB,on,wet}$ AND () $Q_{Truck,S}$ needs to be fulfilled for an activation.

	2 x 2 lane	2 x 3 lane	2 x 4 lane
$\mathbf{Q_{OB,on,wet}}$	> 2800 [vehicle/h]	> 3600 [vehicle/h]	> 4000 [vehicle/h]
$\mathbf{S_{Truck,S,on}}$	> 400 [HGV/h]	> 600 [HGV/h]	> 700 [HGV/h]

Redemption conditions during wet road or limited visibility conditions:
$Q_{OB,off,wet}$ OR ( ) $Q_{Truck,S,off}$ needs to be fulfilled for an activation.

	2 x 2 lane	2 x 3 lane	2 x 4 lane
$\mathbf{Q_{OB,on,wet}}$	≤ 2600 [vehicle/h]	≤ 3400 [vehicle/h]	≤ 3800 [vehicle/h]
$\mathbf{S_{Truck,S,on}}$	≤ 300 [HGV/h]	≤ 500 [HGV/h]	≤ 600 [HGV/h]

Lessons learnt / factor of success / topics considered as good practice (technical, legal, organisational, financial)	
Impacts assessment / results (if available)	

ILLUSTRATIONS	

REFERENCES	
Documentation available on the project	
Web link	https://www.bast.de

1.2.5.2 Highways England HGV Overtaking Ban

GENERAL INFORMATION	
Name of service/system/project	Highways England HGV Overtaking Ban
Name of operator/organisation	Highways England, United Kingdom
Service delivery	☒ Public ☐ Private
Mainly applicable Deployment Guideline	TMS-DG06 HGV Overtaking Ban
Other relevant Deployment Guideline(s)	
Contact for more information	www.highway.gov.uk

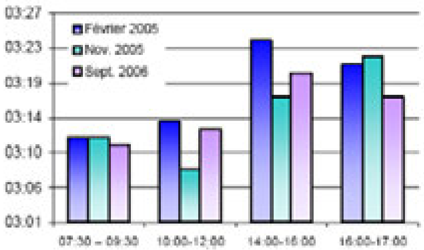
GEOGRAPHICAL ASPECTS	
Country	United Kingdom
Region of implementation	West Midlands
Corridor(s) or Network(s) concerned	North Sea – Mediterranean / Arc Atlantique

ITS SERVICE DESCRIPTION	
General Objectives	☒ Reduction of congestion ☒ Increase of safety ☒ Reduction of environmental damage ☐ Protection of the road infrastructure ☒ Increase traveller comfort ☐ Other
Specific Objectives	☐ Change the distribution in time of transport in order to achieve a more even allocation, avoiding peaks (access restrictions, fees) ☐ Change the distribution of transport in space in order to achieve a more even distribution on the network and prevent "wrong vehicles on wrong places" (traffic control, traffic management, traffic information, access restrictions) ☒ Change the composition of vehicles on a certain piece of infrastructure (access restrictions, fees) ☐ Manage the flow on a given road section in order to reduce speed variation and thus improve the capacity and reduce the risk of incidents ☐ Manage access to a given road section in order to prevent disturbances and reduce the risk of incidents (e.g. ramp metering) ☐ Increase the speed on the link and thus increase capacity (throughput) ☐ Reduce the risk of incidents and traffic disruptions through better informed infrastructure users (traffic and traveller information) ☐ Reduce the consequences from disruptions through fast countermeasures (incident response time) ☐ Reduce traffic volumes through redistributing transport between transport modes ☐ Other
Short narrative description of your best practice including e.g. geographical dimension, numbers, target group like HGV or passengers, costs etc.	The introduction of an banning HGV's on a 5km congested stretch of the northbound M42 J10 -11 where traffic flows are high (29,000 vpd (AADT) northbound; 23% HGV). The main objective of this trial was to reduce the congestion due to the high percentage of relatively slow vehicles on this incline. Many HGV's tried to overtake on this incline when the speed differential was low causing frustration and congestion. Before the trial, many LV drivers experienced unsafe conditions, congestion and uncomfortable situations. Experimentation was conducted between 7:00 am – 7:00 pm for HGV > 7.5t. on this 5km section of the M42 for an 18-month duration from October 2005. Whilst this study was carried out some time ago, the lessons are clear and could be transferred to other congested roads in Europe.
Relation with national access point set up according to EC Delegated Regulations	☐ Provide information to the national access point ☐ Receive information from the national access point ☐ No connection to the national access point

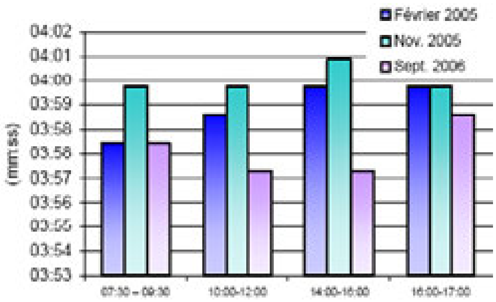
Information provision to end users	☐ Web portal ☐ Phone app ☒ VMS ☐ In-vehicle information ☐ Other

IMPLEMENTATION ASPECTS

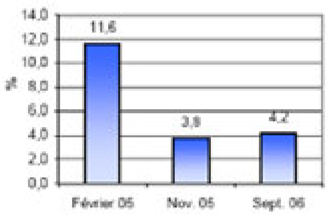
Year of implementation (+ end date of measure if applicable)	2005
Technical description	Deployment of fixed and variable message signs together with detector equipment advising that an HGV overtaking ban is implemented. Experimentation was conducted between 7:00 am – 7:00 pm for HGV > 7.5t. on this 5km section of the M42 for an 18-month duration from October 2005.
Lessons learnt / factor of success / topics considered as good practice (technical, legal, organisational, financial)	The graphs below indicate the time for Light Vehicles and Heavy Goods Vehicles prior to and post implementation in October 2005.



Light Vehicles



Heavy Good Vehicles



Impacts assessment / results (if available)	The rate of HGV overtaking has reduced considerably (by two thirds). This could be reduced further with additional enforcement. Similar restrictions have now been successfully introduced elsewhere on Highways England's network.

ILLUSTRATIONS

	To follow.

REFERENCES

Documentation available on the project	Highways England can be contacted via the link given below.
Web link	www.highways.gov.uk

1.2.5.3 Permanent overtaking ban along the Brenner Motorway (A22) – Italy

GENERAL INFORMATION	
Name of service/system/project	Permanent overtaking ban along the Brenner Motorway (A22) - Italy
Name of operator/organisation	Autostrada del Brennero
Service delivery	☐ Public ☒ Private
Mainly applicable Deployment Guideline	TMS-DG06
Other relevant Deployment Guideline(s)	
Contact for more information	ilaria.debiasi@autobrennero.it

GEOGRAPHICAL ASPECTS	
Country	Italy
Region of implementation	Trentino Alto Adige, Veneto, Lombardia
Corridor(s) or Network(s) concerned	Brenner Corridor

ITS SERVICE DESCRIPTION	
General Objectives	☐ Reduction of congestion ☒ Increase of safety ☐ Reduction of environmental damage ☐ Protection of the road infrastructure ☐ Increase traveller comfort ☐ Other
Specific Objectives	☐ Change the distribution in time of transport in order to achieve a more even allocation, avoiding peaks (access restrictions, fees) ☒ Change the distribution of transport in space in order to achieve a more even distribution on the network and prevent "wrong vehicles on wrong places" (traffic control, traffic management, traffic information, access restrictions) ☐ Change the composition of vehicles on a certain piece of infrastructure (access restrictions, fees) ☐ Manage the flow on a given road section in order to reduce speed variation and thus improve the capacity and reduce the risk of incidents ☐ Manage access to a given road section in order to prevent disturbances and reduce the risk of incidents (e.g. ramp metering) ☐ Increase the speed on the link and thus increase capacity (throughput) ☒ Reduce the risk of incidents and traffic disruptions through better informed infrastructure users (traffic and traveller information) ☐ Reduce the consequences from disruptions through fast countermeasures (incident response time) ☐ Reduce traffic volumes through redistributing transport between transport modes ☐ Other
Short narrative description of your best practice including e.g. geographical dimension, numbers, target group like HGV or passengers, costs etc.	Between the Brenner pass and Modena (314 km) the A22 uses a permanent overtaking ban detailed as follows: — overtaking ban in both directions from Brennero (km 0) to Modena (km 314 - intersection with A1) for vehicles weighing over 7,5 t when fully loaded and for articulated vehicles towing mobile homes or trailers, 24 hours per day.
Relation with national access point set up according to EC Delegated Regulations	☐ Provide information to the national access point ☐ Receive information from the national access point ☒ No connection to the national access point
Information provision to end users	☒ Web portal ☒ Phone app ☒ VMS ☐ In-vehicle information ☒ Other: fixed road signs

IMPLEMENTATION ASPECTS	
Year of implementation (+ end date of measure if applicable)	2017 (overtaking ban extended to the whole motorway)
Technical description	Autostrada del Brennero doesn't use dynamic overtaking bans and the permanent ban is displayed on VMS and signalled by fixed road signs as well. In both cases the tonnage of the concerned HGV is showed.
Lessons learnt / factor of success / topics considered as good practice (technical, legal, organisational, financial)	The A22 permanent overtaking ban was introduced first in 2007 as follows: — from the Brenner pass (Austrian border) to Bolzano South (about 85 km with a lot of curves, viaducts and tunnels): 24 h ban for HGVs > 7,5 t, caravans and trailers; — from Bolzano South to Modena (About 229 km): from 6 a.m. to 10 p.m. for HGVs > 12 t, caravans and trailers. Since 2007 the Company has kept on monitoring the data related to the accidents occured along the motorway: indicators have shown a clear reduction of accidents and their minor severeness where the overtaking ban was applied. Considering this and also the fact that between 2016 and 2017 traffic volumes increased by +3.98% along the A22 motorway, the Company decided to extend the overtaking ban. This measure was necessary also to prevent misunderstandings and problems arising due to the fact that different bans (according to vehicles mass and to the ban period) were applied on different motorway stretches.
Impacts assessment / results (if available)	/

ILLUSTRATIONS


UEBERHOLVERBOT
FUER PKW MIT
ANHANGER


DIVIETO DI SORPASSO
VETTURE TRAINANTI
RIMORCHI

REFERENCES	
Documentation available on the project	
Web link	http://www.autobrennero.it

1.2.6 TMS-06 Incident Warning and Management

1.2.6.1 Dutch road inspection vehicles to be equipped with sirens, blue lights

GENERAL INFORMATION	
Name of service/system/project	Dutch road inspection vehicles equipped with sirens and blue lights
Name of operator/organisation	Rijkswaterstaat
Service delivery	☒ Public ☐ Private
Mainly applicable Deployment Guideline	TMS-DG05Incident Warning and Management
Other relevant Deployment Guideline(s)	
Contact for more information	Jelle de Heij

GEOGRAPHICAL ASPECTS	
Country	The Netherlands
Region of implementation	National road network
Corridor(s) or Network(s) concerned	National road network

ITS SERVICE DESCRIPTION	
General Objectives	☒ Reduction of congestion ☒ Increase of safety ☐ Reduction of environmental damage ☐ Protection of the road infrastructure ☐ Increase traveller comfort ☐ Other
Specific Objectives	☐ Change the distribution in time of transport in order to achieve a more even allocation, avoiding peaks (access restrictions, fees) ☐ Change the distribution of transport in space in order to achieve a more even distribution on the network and prevent "wrong vehicles on wrong places" (traffic control, traffic management, traffic information, access restrictions) ☐ Change the composition of vehicles on a certain piece of infrastructure (access restrictions, fees) ☐ Manage the flow on a given road section in order to reduce speed variation and thus improve the capacity and reduce the risk of incidents ☐ Manage access to a given road section in order to prevent disturbances and reduce the risk of incidents (e.g. ramp metering) ☐ Increase the speed on the link and thus increase capacity (throughput) ☐ Reduce the risk of incidents and traffic disruptions through better informed infrastructure users (traffic and traveller information) ☒ Reduce the consequences from disruptions through fast countermeasures (incident response time) ☐ Reduce traffic volumes through redistributing transport between transport modes ☐ Other

Short narrative description of your best practice including e.g. geographical dimension, numbers, target group like HGV or passengers, costs etc.	Vehicles of the road inspectors of Rijkswaterstaat (RWS), used for incident management, are nowadays equipped with sirens and blue flashing lights. During a 2-year pilot it appeared that on average a road inspector arrived at incidents about 20 percent more quickly, compared with using the former orange flashing light only (no sirens as well). Since September 1st 2017 RWS is classified as an official aid agency, which gives legally permission to use more signals, like the flashing blue lights on vehicles. Road inspectors of RWS are often the first to arrive at the scene of an accident. Their job is to secure the location by closing one or more lanes of the road so other emergency services can drive more safely and quickly to the location of the incident. Because of the blue light the vehicles are better visible and recognizable which improves safety. It appears as well that the public is more willing to create space on the road which is needed for incident management. All 350 RWS road inspectors are especially trained using the blue lights while driving. Using blue light and siren is done in urgent situations only.
Relation with national access point set up according to EC Delegated Regulations	☐ Provide information to the national access point ☐ Receive information from the national access point ☒ No connection to the national access point
Information provision to end users	☐ Web portal ☐ Phone app ☐ VMS ☐ In-vehicle information ☐ Other

IMPLEMENTATION ASPECTS

Year of implementation (+ end date of measure if applicable)	September 1st 2017
Technical description	Installation on the roof and front of blue flashing light and sirens to the road inspector vehicle. Next to the orange flashing light.
Lessons learnt / factor of success / topics considered as good practice (technical, legal, organisational, financial)	▪ Decrease of the arrival time of road inspectors at incident scenes. ▪ A positive response of the public towards the road inspector in following up safety instructions.
Impacts assessment / results (if available)	A 2-year pilot shows that on average a vehicle equipped with blue flash light plus siren arrives about 20 percent more quickly at the spot of an incident, compared with using the former orange flashing light only (no sirens as well).

ILLUSTRATIONS

REFERENCES

Documentation available on the project	
Web link	www.rijkswaterstaat.nl

1.2.6.2 European driver-oriented SOS system for Incident Management

GENERAL INFORMATION	
Name of service/system/project	European driver-oriented SOS system for Incident Management
Name of operator/organisation	Autostrada Brescia-Padova SpA
Service delivery	☐ Public ☒ Private
Mainly applicable Deployment Guideline	TMS-DG05
Other relevant Deployment Guideline(s)	TMS DG05-08 Incident Warning and Management
Contact for more information	andrea.braggio@autobspd.it eugenio.gonzato@autobspd.it

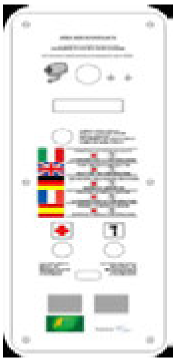
GEOGRAPHICAL ASPECTS	
Country	Italy
Region of implementation	Lombardia, Veneto
Corridor(s) or Network(s) concerned	Motorway

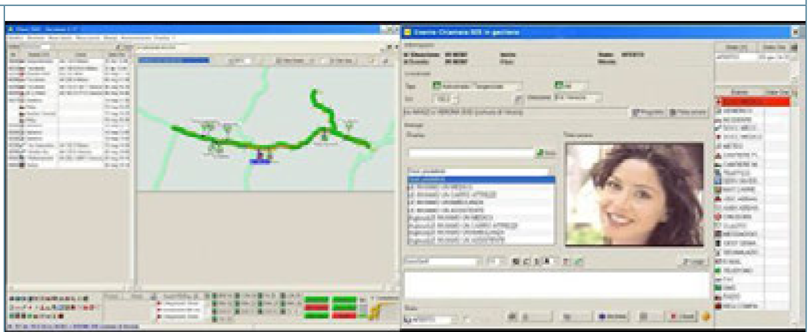
ITS SERVICE DESCRIPTION	
General Objectives	☒ Reduction of congestion ☒ Increase of safety ☐ Reduction of environmental damage ☐ Protection of the road infrastructure ☐ Increase traveller comfort ☐ Other
Specific Objectives	☐ Change the distribution in time of transport in order to achieve a more even allocation, avoiding peaks (access restrictions, fees) ☐ Change the distribution of transport in space in order to achieve a more even distribution on the network and prevent “wrong vehicles on wrong places” (traffic control, traffic management, traffic information, access restrictions) ☐ Change the composition of vehicles on a certain piece of infrastructure (access restrictions, fees) ☐ Manage the flow on a given road section in order to reduce speed variation and thus improve the capacity and reduce the risk of incidents ☐ Manage access to a given road section in order to prevent disturbances and reduce the risk of incidents (e.g. ramp metering) ☐ Increase the speed on the link and thus increase capacity (throughput) ☒ Reduce the risk of incidents and traffic disruptions through better informed infrastructure users (traffic and traveller information) ☒ Reduce the consequences from disruptions through fast countermeasures (incident response time) ☐ Reduce traffic volumes through redistributing transport between transport modes ☐ Other
Short narrative description of your best practice including e.g. geographical dimension, numbers, target group like HGV or passengers, costs etc.	A new emergency call and monitoring system on the entire motorway Brescia-Padova network (182 km), following a pilot in 2010-2011. An important peculiarity of the system is represented by the multi-lingual interface facilitating its usage by the European traveller. Functionalities: low consumption CPU, serial ports, USB, display drivers, temperature probes, ethernet port and SD card reader, VoIP, colour camera with infrared LEDs, backlit display, the proximity sensor, the pre-recorded voice messages in 5 languages, transmission of information in digital mode, film with printed instructions for users in 5 main languages.
Relation with national access point set up according to EC Delegated Regulations	☐ Provide information to the national access point ☐ Receive information from the national access point ☒ No connection to the national access point

Information provision to end users	☐ Web portal ☐ Phone app ☐ VMS ☐ In-vehicle information ☒ Other: point of emergency call (SOS column)

IMPLEMENTATION ASPECTS	
Year of implementation (+ end date of measure if applicable)	10/02/2011 – 30/04/2011
Technical description	SOS emergency system is able to use different channels for transmission of data between the point of call (SOS column) and operation centre. In the specific case, the road data network was built on a SHDSL backbone that attests to the tollbooths. This allows to limit the "out of service" in the event of a failure at single location SOS or, in more serious cases to the devices between the one tollbooth and another. A new system has less downtime in case of abnormality due to redundancy of data and power, as, using battery, it allows the operation of the SOS column until the intervention of a technician.
Lessons learnt / factor of success / topics considered as good practice (technical, legal, organisational, financial)	The low power consumption in stand-by mode of electronic components in connection with the operation centre allows to empower the device using solar panels, enhancing the sustainability of infrastructure.
Impacts assessment / results (if available)	The main goal of the pilot project - to check out the effectiveness in field of a new system - is successfully achieved. The pilot demonstrates the reduction of the reaction times both from operators and users thanks to improved data-transmission features of the SOS system, increasing of effectiveness by addressing also foreigners with multilingual answers and enhancing of functionality due to alternative types of energy supply allowing a remote control of the motorway stretch and a localisation of a failure on the single device without a block-out of the whole system. Furthermore thanks to the pilot experience some weaknesses in the telecommunication part of the system could be identified and solved, allowing a final achievement very effective and satisfactory.

ILLUSTRATIONS





REFERENCES	
Documentation available on the project	Ex-ante Evaluation Report Innovative European Driver-oriented SOS System
Web link	www.autobspd.it

1.2.6.3 Incident warning system on RN205 for traffic incidents, snow, rock falls

GENERAL INFORMATION	
Name of service/system/project	Incident warning system on RN205 for traffic incidents, snow, rock falls
Name of operator/organisation	Autoroutes et Tunnel du Mont Blanc (ATMB)
Service delivery	☒ Public ☐ Private
Mainly applicable Deployment Guideline	TMS DG05
Other relevant Deployment Guideline(s)	
Contact for more information	A préciser

GEOGRAPHICAL ASPECTS	
Country	France
Region of implementation	France – Italy (Alps corridor)
Corridor(s) or Network(s) concerned	The section of the RN205 between the A40 motorway and the Mont Blanc tunnel, part of the ATMB concession network

ITS SERVICE DESCRIPTION	
General Objectives	☐ Reduction of congestion ☒ Increase of safety ☐ Reduction of environmental damage ☒ Protection of the road infrastructure ☐ Increase traveller comfort ☐ Other
Specific Objectives	☐ Change the distribution in time of transport in order to achieve a more even allocation, avoiding peaks (access restrictions, fees) ☐ Change the distribution of transport in space in order to achieve a more even distribution on the network and prevent "wrong vehicles on wrong places" (traffic control, traffic management, traffic information, access restrictions) ☐ Change the composition of vehicles on a certain piece of infrastructure (access restrictions, fees) ☐ Manage the flow on a given road section in order to reduce speed variation and thus improve the capacity and reduce the risk of incidents ☐ Manage access to a given road section in order to prevent disturbances and reduce the risk of incidents (e.g. ramp metering) ☐ Increase the speed on the link and thus increase capacity (throughput) ☒ Reduce the risk of incidents and traffic disruptions through better informed infrastructure users (traffic and traveller information) ☒ Reduce the consequences from disruptions through fast countermeasures (incident response time) ☐ Reduce traffic volumes through redistributing transport between transport modes ☐ Other
Short narrative description of your best practice including e.g. geographical dimension, numbers, target group like HGV or passengers, costs etc.	Since 2010, ATMB has striven to provide the same level of service on this national road section as on the whole of its motorway network. A dynamic equipment has therefore been installed, including: signing equipment, weather sensors, and traffic counting stations, video equipment, and AID systems. This equipment communicates with the operating aid system at the SIERRA control centre located in Bonneville in Haute Savoie. Arrester bed incident management on the RN205 is an example of dynamic field equipment coordination that enables the SIERRA control centre to deal with incidents rapidly, therefore providing a high level of service to users.

Relation with national access point set up according to EC Delegated Regulations	☒ Provide information to the national access point ☐ Receive information from the national access point ☐ No connection to the national access point
Information provision to end users	☒ Web portal ☐ Phone app ☒ VMS ☐ In-vehicle information ☐ Other

IMPLEMENTATION ASPECTS

Year of implementation (+ end date of measure if applicable)	This project has been operational since 29th June 2012.
Technical description	The system in place alerts the SIERRA control centre in real time when a vehicle enters one of the two arrester beds on the Egratz slope. The SIERRA control centre operators, who permanently monitor traffic (24/7), can therefore take any necessary measures to guarantee user safety and maintain traffic flow. The whole process of vehicle detection in an arrester bed and the actions/measures dynamically suggested at the SIERRA control centre are detailed in the evaluation report.
Lessons learnt / factor of success / topics considered as good practice (technical, legal, organisational, financial)	This system aims to deal with an incident as soon as possible after it has occurred. The sooner traffic disruptions are detected, the sooner corrective measures can be taken, reducing the impact of incidents on traffic flow. Moreover, it enables the area to be made safe rapidly, so as to avoid a further accident, but also the relevant rescue services to be deployed without wasting time. From a technical point of view, it can be noted that all the alarms had an objective cause; there was no false alert. From a road operations point of view, fortunately no heavy vehicle has been detected to date and it has been shown that the alarm enables the operator to react rapidly to an incident
Impacts assessment / results (if available)	So far there have been insufficient incidents which have occurred to enable a detailed study of scheme benefits to be undertaken. (à mettre à jour en fonction des détections relevées)

ILLUSTRATIONS

REFERENCES

Documentation available on the project	Incident warning on N205 against incident, snow, stones (Evaluation report)
Web link	www.atmb.com/fr

1.2.6.4 Integrated UI + ICT Platform for road traffic management T-LOIK and Web-based UI for other authorities WebLoik

GENERAL INFORMATION	
Name of service/system/project	Integrated UI + ICT Platform for road traffic management T-LOIK and Web-based UI for other authorities WebLoik
Name of operator/organisation	Traffic Management Finland Group (TMFG, state-owned company responsible for traffic management),
Service delivery	☒ Public ☐ Private
Mainly applicable Deployment Guideline	TMS-DG05 Incident Warning and Management
Other relevant Deployment Guideline(s)	
Contact for more information	Markus Nilsson, markus.nilsson@tmfg.fi Jani Laiho, jani.laiho@tmfg.fi

GEOGRAPHICAL ASPECTS	
Country	Finland
Region of implementation	Whole country
Corridor(s) or Network(s) concerned	Main road network

ITS SERVICE DESCRIPTION	
General Objectives	☒ Reduction of congestion ☒ Increase of safety ☐ Reduction of environmental damage ☐ Protection of the road infrastructure ☒ Increase traveller comfort ☒ Other: To Increase the level of effectiveness of the work of the TMC operator
Specific Objectives	☐ Change the distribution in time of transport in order to achieve a more even allocation, avoiding peaks (access restrictions, fees) ☐ Change the distribution of transport in space in order to achieve a more even distribution on the network and prevent "wrong vehicles on wrong places" (traffic control, traffic management, traffic information, access restrictions) ☐ Change the composition of vehicles on a certain piece of infrastructure (access restrictions, fees) ☐ Manage the flow on a given road section in order to reduce speed variation and thus improve the capacity and reduce the risk of incidents ☐ Manage access to a given road section in order to prevent disturbances and reduce the risk of incidents (e.g. ramp metering) ☐ Increase the speed on the link and thus increase capacity (throughput) ☒ Reduce the risk of incidents and traffic disruptions through better informed infrastructure users (traffic and traveller information) ☒ Reduce the consequences from disruptions through fast countermeasures (incident response time) ☐ Reduce traffic volumes through redistributing transport between transport modes ☐ Other
Short narrative description of your best practice including e.g. geographical dimension, numbers, target group like HGV or passengers, costs etc.	Use modular way of doing things in software development. Made it easier for us to respond to the needs of a new user group, which was not recognized in the beginning of the project. Spin off project, called WebLoik, was created in few months in to the pilot phase. WebLoik allows other authorities to get an operational snapshot of the situation on the road network.
Relation with national access point set up according to EC Delegated Regulations	☒ Provide information to the national access point ☐ Receive information from the national access point ☐ No connection to the national access point

Information provision to end users	☒ Web portal ☐ Phone app ☒ VMS ☐ In-vehicle information ☐ Other

IMPLEMENTATION ASPECTS	
Year of implementation (+ end date of measure if applicable)	Deployment 2013-2018. First phase in operational use 9/2015
Technical description	Integrated UI + ICT platform for road traffic management. Replaces and/ or integrates 30+ separate systems — Road traffic management systems — Camera systems — Traffic information systems — Road weather information systems — Event management and handling — GIS-system and operational snapshot Aims to provide one coherent user interface for TMC operators that can be operated from one workstation and from any geographical location. Centralized alarms and alerts, offers tools to prioritize tasks and allocate resources. In the future will be used to data fusion to provide data analysis, forecasts and different kind of alerts. Also aims to increase automation level in TMC operations. Main goal is to shift from reactive processes to proactive processes.
Lessons learnt / factor of success / topics considered as good practice (technical, legal, organisational, financial)	**Functional** Agile software development methods have been a good way to manage the project. End users (in TMFG´s TMC) have been involved since the beginning and that has been helpful in the development process and in the introduction of T-LOIK. **Technical** TMFG is the integrator and owns development platforms and the source code. Open source, generic and reusable services used as much as possible.
Impacts assessment / results (if available)	

ILLUSTRATIONS

REFERENCES	
Documentation available on the project	
Web link	N/A, meant for internal users in TMFG's TMC

1.2.6.5 Roadworks/ Slot Management

GENERAL INFORMATION	
Name of service/system/project	Roadworks/ Slot Management
Name of operator/organisation	Verkehrszentrale Hessen (Traffic Centre Hessen, VZH)
Service delivery	☐ Public ☒ Private
Mainly applicable Deployment Guideline	TMS-DG05-08_Incident Warning and Management
Other relevant Deployment Guideline(s)	
Contact for more information	www.mobil.hessen.de/kontakt

GEOGRAPHICAL ASPECTS	
Country	Germany
Region of implementation	Hessen
Corridor(s) or Network(s) concerned	URSA MAJOR 2

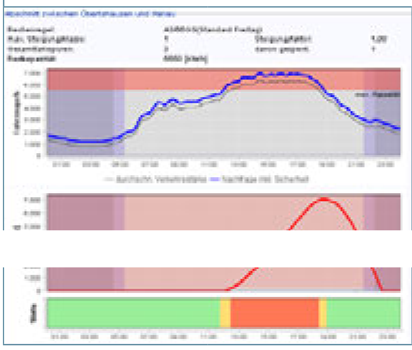
ITS SERVICE DESCRIPTION	
General Objectives	☒ Reduction of congestion ☒ Increase of safety ☐ Reduction of environmental damage ☐ Protection of the road infrastructure ☒ Increase traveller comfort ☐ Other
Specific Objectives	☒ Change the distribution in time of transport in order to achieve a more even allocation, avoiding peaks (access restrictions, fees) ☐ Change the distribution of transport in space in order to achieve a more even distribution on the network and prevent "wrong vehicles on wrong places" (traffic control, traffic management, traffic information, access restrictions) ☐ Change the composition of vehicles on a certain piece of infrastructure (access restrictions, fees) ☐ Manage the flow on a given road section in order to reduce speed variation and thus improve the capacity and reduce the risk of incidents ☐ Manage access to a given road section in order to prevent disturbances and reduce the risk of incidents (e.g. ramp metering) ☐ Increase the speed on the link and thus increase capacity (throughput) ☐ Reduce the risk of incidents and traffic disruptions through better informed infrastructure users (traffic and traveller information) ☐ Reduce the consequences from disruptions through fast countermeasures (incident response time) ☐ Reduce traffic volumes through redistributing transport between transport modes ☒ Other: Reduce the risk of incidents and traffic disruptions within roadwork area through better roadwork management

Short narrative description of your best practice including e.g. geographical dimension, numbers, target group like HGV or passengers, costs etc.	In order to decrease incidents, planning and organisation of roadworks are an important aspect. Therefore, a slot management was added to the existing roadworks management system. The slot management bases on the online booking system for airline and rail tickets without written requests and approvals. The system automatically checks if the transport system can handle a roadwork. Possible timeslots for any planned short term road work are assigned as result of the evaluation in terms of their effects on traffic. The operators like the road maintenance services or external construction companies can choose from these time slots.
Relation with national access point set up according to EC Delegated Regulations	☐ Provide information to the national access point ☐ Receive information from the national access point ☒ No connection to the national access point
Information provision to end users	☐ Web portal ☐ Phone app ☐ VMS ☐ In-vehicle information ☒ Other: Internal traffic management tool

IMPLEMENTATION ASPECTS

Year of implementation (+ end date of measure if applicable)	Roadworks management system: 2003 Roadworks/ Slot management system: 2011
Technical description	The principle of time slot calculation is the estimation of the remaining capacity based on reference profiles of traffic demand. After selecting the road section and the number of blocked lanes the system calculates possible timeslots based on traffic data, expert knowledge and rules. These timeslots are presented in green. Time slots which are marked in red cannot be selected due to the risk of congestion.
Lessons learnt / factor of success / topics considered as good practice (technical, legal, organisational, financial)	
Impacts assessment / results (if available)	Due to the roadworks management system the congestion hours in roadwork could be reduced.

ILLUSTRATIONS



REFERENCES

Documentation available on the project	https://mobil.hessen.de/sites/mobil.hessen.de/files/Baustellenmanagementhandbuch.pdf
Web link	https://mobil.hessen.de/verkehr/intelligenter-verkehr/flott-durch-slot

1.2.6.6 Smoke Detection System

GENERAL INFORMATION	
Name of service/system/project	Smoke Detection System
Name of operator/organisation	SITAF S.p.A.
Service delivery	☒ Public ☐ Private
Mainly applicable Deployment Guideline	TMS-DG05
Other relevant Deployment Guideline(s)	
Contact for more information	info@tecnositaf.it

GEOGRAPHICAL ASPECTS	
Country	Italy
Region of implementation	Piedmont
Corridor(s) or Network(s) concerned	Mediterranean Corridor

ITS SERVICE DESCRIPTION	
General Objectives	☐ Reduction of congestion ☒ Increase of safety ☐ Reduction of environmental damage ☒ Protection of the road infrastructure ☐ Increase traveller comfort ☐ Other
Specific Objectives	☐ Change the distribution in time of transport in order to achieve a more even allocation, avoiding peaks (access restrictions, fees) ☐ Change the distribution of transport in space in order to achieve a more even distribution on the network and prevent "wrong vehicles on wrong places" (traffic control, traffic management, traffic information, access restrictions) ☐ Change the composition of vehicles on a certain piece of infrastructure (access restrictions, fees) ☐ Manage the flow on a given road section in order to reduce speed variation and thus improve the capacity and reduce the risk of incidents ☐ Manage access to a given road section in order to prevent disturbances and reduce the risk of incidents (e.g. ramp metering) ☐ Increase the speed on the link and thus increase capacity (throughput) ☒ Reduce the risk of incidents and traffic disruptions through better informed infrastructure users (traffic and traveller information) ☒ Reduce the consequences from disruptions through fast countermeasures (incident response time) ☐ Reduce traffic volumes through redistributing transport between transport modes ☐ Other
Short narrative description of your best practice including e.g. geographical dimension, numbers, target group like HGV or passengers, costs etc.	The Smoke Detection System is installed into a tunnel 5.000 meters long on the A32 Turin-Bardonecchia Motorway, and it is based on FLIR VIP/T analysis modules. The modules analyzes the analog video stream from the cameras and sends the alarm data, a static event image and a video segment to the FLUX server, also with some other previous captured images. Traffic in 2016 on A32 Motorway: — 8 million vehicles — 1094 rescue interventions — 132 accidents — 46 injured — 1 dead

Relation with national access point set up according to EC Delegated Regulations	☒ Provide information to the national access point ☐ Receive information from the national access point ☐ No connection to the national access point
Information provision to end users	☐ Web portal ☐ Phone app ☒ VMS ☐ In-vehicle information ☐ Other

IMPLEMENTATION ASPECTS

Year of implementation (+ end date of measure if applicable)	2017-2018
Technical description	The aim is to equip all the A32 tunnels with a "VIP/HD + IP codec" system by the end of 2017 – beginning of 2018. The VIP/HD module performs analysis of the digital video streams, while the IP codec digitizes the analogue stream of the camera.
Lessons learnt / factor of success / topics considered as good practice (technical, legal, organisational, financial)	The migration from analogue to digital camera can be done very easily step by step simply by removing a channel from the codec and inserting it into the VIP/HD module.
Impacts assessment / results (if available)	Alarms and video streamings are archived into the software platform of the A32 Motorway Control Centre in order to manage all the safety aspects in a centralized way. The improvements of the detection performances meets the following requirements: ▪ Smoke detection ▪ Pedestrian detection ▪ Stopped vehicle detection ▪ Detection of vehicles entering in wrong direction

ILLUSTRATIONS

REFERENCES	
Documentation available on the project	
Web link	

1.2.6.7 "SOS Autoroute" smartphone application update

GENERAL INFORMATION	
Name of service/system/project	"SOS Autoroute" smartphone application update
Name of operator/organisation	APRR, French motorway operator (member of ASFA)
Service delivery	☒ Public ☐ Private
Mainly applicable Deployment Guideline	TMS-DG05 Incident Warning and Management
Other relevant Deployment Guideline(s)	TIS-DG02 Forecast and Real Time Event Information
Contact for more information	Nicolas CONTANT Head of pole Tel. +33 (0) 1 71 59 12 17 Nicolas.contant@aprr.fr

GEOGRAPHICAL ASPECTS	
Country	France
Region of implementation	a part of the motorway network
Corridor(s) or Network(s) concerned	Arc Atlantic corridor

ITS SERVICE DESCRIPTION	
General Objectives	☐ Reduction of congestion ☒ Increase of safety ☐ Reduction of environmental damage ☐ Protection of the road infrastructure ☒ Increase traveller comfort ☐ Other

Specific Objectives	☐ Change the distribution in time of transport in order to achieve a more even allocation, avoiding peaks (access restrictions, fees) ☐ Change the distribution of transport in space in order to achieve a more even distribution on the network and prevent "wrong vehicles on wrong places" (traffic control, traffic management, traffic information, access restrictions) ☐ Change the composition of vehicles on a certain piece of infrastructure (access restrictions, fees) ☐ Manage the flow on a given road section in order to reduce speed variation and thus improve the capacity and reduce the risk of incidents ☐ Manage access to a given road section in order to prevent disturbances and reduce the risk of incidents (e.g. ramp metering) ☐ Increase the speed on the link and thus increase capacity (throughput) ☒ Reduce the risk of incidents and traffic disruptions through better informed infrastructure users (traffic and traveller information) ☐ Reduce the consequences from disruptions through fast countermeasures (incident response time) ☐ Reduce traffic volumes through redistributing transport between transport modes ☒ Other: User communicate more rapidly and more accurately with emergency services
Short narrative description of your best practice including e.g. geographical dimension, numbers, target group like HGV or passengers, costs etc.	Emergency call networks are available in France's entire highways network. They are accessible to users through call booths located in strategic points of highways. In case of an incident, any user can leave his/her vehicle to make a call from the booth directly to the emergency services. Nevertheless, this system presents two major difficulties: — Users need to walk on the highway to reach the booths, potentially putting themselves and other vehicles in more danger, — Users tend to use their mobile phones to call emergency services, who cannot locate the incident accurately. A smartphone application allows users to contact emergency services from a safe location not far from the incident, which is easily tracked via GPS, allowing faster and more precise intervention from the emergency services. APRR started to develop the SOS Autoroutes smartphone application in 2011 as an innovative and more secure way of reporting and identifying accidents and other incidents on its network. The features and the perimeter covered by the application have been evolving since, and APRR decided to make the first major update in 2014 to include new features for both end users and road operators. This project has been updated in 2017 and resulted in a more intuitive and fast user interface, and a richer information transmission for the emergency services. On June 20, 2019, a new version was designed at the request of CCP services to secure the delivery of emergency services to the scene of the incident. The total cost of the project is 50 000 €
Relation with national access point set up according to EC Delegated Regulations	☒ Provide information to the national access point ☐ Receive information from the national access point ☐ No connection to the national access point
Information provision to end users	☐ Web portal ☐ Phone app ☐ VMS ☐ In-vehicle information ☒ Other: incident information is provided by the user through a phone application

IMPLEMENTATION ASPECTS	
Year of implementation (+ end date of measure if applicable)	Start date: January 2014 End date: January 2017

Technical description	The main feature is an emergency button that simultaneously sends a GPS signal while letting the user contact the services through the emergency call network, wherever internet connexion and GPS signal are available. If they aren't available, the application automatically redirects the user to the 'normal' emergency phone line. Since, the application has been through several evolutions, which have led to new features such as creating a user profile. Information of the user profile, such as type of vehicle and number plate can potentially help emergency services prepare in case of an intervention. Moreover, APRR started working with other road operators in France to expand the application's coverage. This project consists on a major update of the SOS Autoroute application. APRR carried a survey to collect reviews and ideas from both users and non-users of the application. Then, the developers created prototypes that were tested by a user panel, and eventually designed the new application starting from these prototypes. The new features include: — A new user interface with new design and improved ergonomics — Supporting user to signal an incident for another vehicle — Allowing user to check and update GPS position — Allowing user to check and recover an overview of the call — Possibility to have an emergency without creating an account — Delivering more specific information for emergency services (nature of the incident, type of vehicle…) — Integrating e-call and emergency call network on the same backdoor interface — Display of interventions history's and sending summary by email — Addition of the post-call button on the summary presentation stage — Addition of the telephone number entry screen at the end of the informant qualification process — Improved control over entering telephone numbers by prefix
Lessons learnt / factor of success / topics considered as good practice (technical, legal, organisational, financial)	From the user perspective, the new version of the application allow her/him to communicate more rapidly and more accurately with emergency services. It brings the opportunity to signal events even when not directly involved in it. It will also let users keep better track of the event and the call for more transparency on incident mitigation. From the emergency services' point of view, the new features help to better anticipate the intervention, collecting more information on the incident before getting to the site, and centralizing calls from different sources. APRR sees this application as a practical and low cost solution to precisely monitor highway incidents. The solution has been tuned to fit user's habits and connectivity, and eventually fills a gap while the e-call service is fully deployed.
Impacts assessment / results (if available)	

ILLUSTRATIONS

REFERENCES	
Documentation available on the project	
Web link	www.autoroutes.fr/mobile/sos-autoroutes-aprr.htm

1.2.6.8 SOS on board system

GENERAL INFORMATION	
Name of service/system/project	SOS ON BOARD SYSTEM
Name of operator/organisation	SITAF S.p.A.
Service delivery	☒ Public ☐ Private
Mainly applicable Deployment Guideline	TMS-DG05
Other relevant Deployment Guideline(s)	
Contact for more information	info@tecnositaf.it

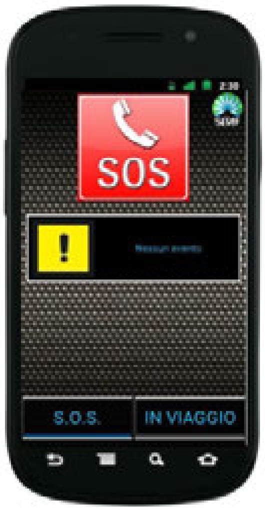
GEOGRAPHICAL ASPECTS	
Country	Italy
Region of implementation	Piedmont
Corridor(s) or Network(s) concerned	Mediterranean Corridor

ITS SERVICE DESCRIPTION	
General Objectives	☐ Reduction of congestion ☒ Increase of safety ☐ Reduction of environmental damage ☐ Protection of the road infrastructure ☒ Increase traveller comfort ☐ Other
Specific Objectives	☐ Change the distribution in time of transport in order to achieve a more even allocation, avoiding peaks (access restrictions, fees) ☐ Change the distribution of transport in space in order to achieve a more even distribution on the network and prevent "wrong vehicles on wrong places" (traffic control, traffic management, traffic information, access restrictions) ☐ Change the composition of vehicles on a certain piece of infrastructure (access restrictions, fees) ☐ Manage the flow on a given road section in order to reduce speed variation and thus improve the capacity and reduce the risk of incidents ☐ Manage access to a given road section in order to prevent disturbances and reduce the risk of incidents (e.g. ramp metering) ☐ Increase the speed on the link and thus increase capacity (throughput) ☒ Reduce the risk of incidents and traffic disruptions through better informed infrastructure users (traffic and traveller information) ☒ Reduce the consequences from disruptions through fast countermeasures (incident response time) ☐ Reduce traffic volumes through redistributing transport between transport modes ☒ Other: Direct contact between road users and road managers

Short narrative description of your best practice including e.g. geographical dimension, numbers, target group like HGV or passengers, costs etc.	Inside the T4 International Frejus Tunnel there are no Gsm / Umts networks available, except one FM radio station broadcasting a security message for the drivers. The SOS on Board is the only way to have two-way communication to get rescue as an alternative to getting to the shelters. The Frejus tunnel, between Italy and France, is 12,800 meters long. Traffic / year is about 1,7 million vehicles passing under the tunnel (733,235 heavy vehicles - 1,042,495 light vehicles) In 2016: — 230 interventions by rescue teams — 9 accidents (with no injuries) — 6 fires
Relation with national access point set up according to EC Delegated Regulations	☐ Provide information to the national access point ☐ Receive information from the national access point ☒ No connection to the national access point
Information provision to end users	☐ Web portal ☒ Phone app ☐ VMS ☐ In-vehicle information ☐ Other

IMPLEMENTATION ASPECTS	
Year of implementation (+ end date of measure if applicable)	2017 - 2018
Technical description	Wi-Fi access points along the 12,800m of Frejus Tunnel will be installed. The installations include: — Dedicated Fiber Optic Backbone — powered backbone from tunnel technicians (PHT) — Wall brackets — Locker placed in the fresh air duct equipped with power supply and POE switch — Radio and mother board, installed along the fresh air line near the cabinets — Wi-Fi antennas installed along Frejus Tunnel Italy-France
Lessons learnt / factor of success / topics considered as good practice (technical, legal, organisational, financial)	The project involves the installation of a Wi-Fi network capable of securing connectivity, VoIP calls, localization of vehicles and people inside the Frejus Tunnel. Relevant scope of the project is the usage of common smartphones for both users and service teams.
Impacts assessment / results (if available)	▪ Improved communication with the Control Centre between Users and emergency teams communication ▪ Point-to-point or multicast communication ▪ Voice messages and / or text messages

ILLUSTRATIONS



REFERENCES

Documentation available on the project	
Web link	

1.2.6.9 TCC and data exchange upgrading

GENERAL INFORMATION	
Name of service/system/project	TCC and data exchange upgrading
Name of operator/organisation	Strada dei Parchi S.p.A.
Service delivery	☐ Public ☒ Private
Mainly applicable Deployment Guideline	TMS-DG05
Other relevant Deployment Guideline(s)	
Contact for more information	Trinchini Cristian (CTrinchini@stradadeiparchi.it)

GEOGRAPHICAL ASPECTS	
Country	Italy
Region of implementation	URSA MAJOR Corridor
Corridor(s) or Network(s) concerned	Motorways A24 and A25 – Abruzzo (Italy)

ITS SERVICE DESCRIPTION	
General Objectives	☒ Reduction of congestion ☒ Increase of safety ☐ Reduction of environmental damage ☐ Protection of the road infrastructure ☐ Increase traveller comfort ☐ Other
Specific Objectives	☐ Change the distribution in time of transport in order to achieve a more even allocation, avoiding peaks (access restrictions, fees) ☐ Change the distribution of transport in space in order to achieve a more even distribution on the network and prevent “wrong vehicles on wrong places” (traffic control, traffic management, traffic information, access restrictions) ☐ Change the composition of vehicles on a certain piece of infrastructure (access restrictions, fees) ☐ Manage the flow on a given road section in order to reduce speed variation and thus improve the capacity and reduce the risk of incidents ☐ Manage access to a given road section in order to prevent disturbances and reduce the risk of incidents (e.g. ramp metering) ☐ Increase the speed on the link and thus increase capacity (throughput) ☒ Reduce the risk of incidents and traffic disruptions through better informed infrastructure users (traffic and traveller information) ☒ Reduce the consequences from disruptions through fast countermeasures (incident response time) ☐ Reduce traffic volumes through redistributing transport between transport modes ☐ Other
Short narrative description of your best practice including e.g. geographical dimension, numbers, target group like HGV or passengers, costs etc.	The project has been developed for two twin-tube tunnels with length greater than 4 Km for which, because of considerable length, it is crucial to detect critical events in real time (stationary vehicle, accident, vehicle on fire, etc.) and communicate in real time between control centres of various entities involved. The project consists of the realization of a software application for the Automatic Incident Detection and Smoke Detection in tunnel. The traffic information in the tunnels are made available in format DATEXII to be monitored and processed by the operators of the Control Centres located at the Gran Sasso tunnel and the Radio Information Centre of Rome. It will be guaranteed the management of about 160 intelligent cameras, inside the tunnel, located about 150 meters from each other. In this way It is possible to ensure a rapid intervention of rescue teams by raising the level of safety in tunnels.
Relation with national access point set up according to EC Delegated Regulations	☐ Provide information to the national access point ☐ Receive information from the national access point ☒ No connection to the national access point

Information provision to end users	☒ Web portal ☐ Phone app ☒ VMS ☐ In-vehicle information ☒ Other: Dedicated radio channel (Isoradio)

IMPLEMENTATION ASPECTS	
Year of implementation (+ end date of measure if applicable)	2015 - in operation
Technical description	The operators of the Control Room through the alarm system and video surveillance system monitor the system recently installed in the tunnel, that registers the presence of critical events. In case of incident (stationary vehicle, accident, vehicle on fire) all communications and early warnings, provided by the Control Centre, are sent. The traffic auxiliary team is called urgently on the site of the accident, also the sending and the intervention of a patrol of the Traffic Police is required to the Central Motorway Traffic Police (or other IM responders, if needed). At the same time Control Centre indicates the presence of the event through the portals VMS in approach to the tunnel, as well as through the media channels and the dedicated radio channel (Isoradio). In addition, the red cross symbol on the Lane Availability Indicators is automatically inserted to block traffic.
Lessons learnt / factor of success / topics considered as good practice (technical, legal, organisational, financial)	
Impacts assessment / results (if available)	The system is in operation from 2015 therefore there isn't impact assessment.

ILLUSTRATIONS	
	

REFERENCES	
Documentation available on the project	
Web link	

1.2.6.10 Traffic Control Software 2.0 – CROCODILE project

GENERAL INFORMATION	
Name of service/system/project	Traffic Control Software 2.0 – CROCODILE project
Name of operator/organisation	Magyar Közút Nzrt. – Hungarian Public Road Non-profit Plc.
Service delivery	☒ Public ☐ Private
Mainly applicable Deployment Guideline	TMS-DG05 – Incident Warning and Management
Other relevant Deployment Guideline(s)	DTX-DG01 – DATEX II
Contact for more information	Mr. Tamás Tomaschek, cef@kozut.hu

GEOGRAPHICAL ASPECTS	
Country	Hungary
Region of implementation	Nationwide
Corridor(s) or Network(s) concerned	Mediterranean, Orient East-Med, CROCODILE

ITS SERVICE DESCRIPTION	
General Objectives	☒ Reduction of congestion ☒ Increase of safety ☐ Reduction of environmental damage ☐ Protection of the road infrastructure ☐ Increase traveller comfort ☒ Other: optimisation of traffic management, integration of subsystems
Specific Objectives	☐ Change the distribution in time of transport in order to achieve a more even allocation, avoiding peaks (access restrictions, fees) ☒ Change the distribution of transport in space in order to achieve a more even distribution on the network and prevent “wrong vehicles on wrong places” (traffic control, traffic management, traffic information, access restrictions) ☐ Change the composition of vehicles on a certain piece of infrastructure (access restrictions, fees) ☐ Manage the flow on a given road section in order to reduce speed variation and thus improve the capacity and reduce the risk of incidents ☐ Manage access to a given road section in order to prevent disturbances and reduce the risk of incidents (e.g. ramp metering) ☐ Increase the speed on the link and thus increase capacity (throughput) ☒ Reduce the risk of incidents and traffic disruptions through better informed infrastructure users (traffic and traveller information) ☐ Reduce the consequences from disruptions through fast countermeasures (incident response time) ☐ Reduce traffic volumes through redistributing transport between transport modes ☐ Other
Short narrative description of your best practice including e.g. geographical dimension, numbers, target group like HGV or passengers, costs etc.	The Traffic Control Software 2.0 (FIR 2.0) of Hungarian Public Road Non-profit Ltd. (MK) is a nationwide data collection, monitoring and management system that provides the opportunity to manage every single roadside equipment and to display real-time data gathered from various monitoring systems and data sources on a common Graphic User Interface.
Relation with national access point set up according to EC Delegated Regulations	☒ Provide information to the national access point ☒ Receive information from the national access point ☐ No connection to the national access point
Information provision to end users	☐ Web portal ☐ Phone app ☒ VMS ☒ In-vehicle information ☒ Other: Datex II XML message

IMPLEMENTATION ASPECTS	
Year of implementation (+ end date of measure if applicable)	2015
Technical description	MK collects several types of transport related data on its nationwide managed network. These data were acquired and processed by different subsystems. The emerging number of different systems was an obstacle to access essential data for traffic management purposes. For this reason it was justified to integrate all subsystems: ▪ Traffic counting stations ▪ Video detection ▪ Emergency phones ▪ Variable Message Signs ▪ Road weather stations ▪ Monitoring and managing devices (sabotage alerts) ▪ ITP (intelligent truck parking) system ▪ Travel Time Information system, etc. As the result of the integration, MK created the FIR 1.0 software in the Framework of CONNECT project (phase III) in 2009. FIR 1.0 was a classic so called thick-client software, and this was the first application, that has made it possible to display the information of subsystems listed above on one single screen GUI. This implementation was a great help for the traffic management operators, they had all the necessary information on their desktop. With the progress and change, the thick-client architecture became outdated. With the ever growing databases and the change of user needs, the need for a revision of the software has arisen. As the result of the development, MK developed the 2.0 version in the framework of CROCODILE project. (Figure 1) The new FIR 2.0 is available via web browsers, allowing remote operation, too. Its user interface and ergonomics meet the requirements of the modern age. It is based on a vector-graphical map, where the management features can be displayed by activating/ deactivating different layers. (Figure 2) On the single screen interface of FIR 2.0 the operator can manage all subsystems which were integrated previously in FIR 1.0, but new additional functions were implemented in the new version of FIR. These are the following (Figure 3): ▪ "DATEX II" data exchange – traffic related events on map ▪ C-ITS module (fixed and mobile C-ITS transceivers) Besides the management & control functions FIR 2.0 also performs administrative and statistical tasks. (Figure 4)
Lessons learnt / factor of success / topics considered as good practice (technical, legal, organisational, financial)	The main goal of the project – to enhance the efficiency with a new system – is successfully achieved. The planned additional functions have been installed within the software. The user interface has been more ergonomic and user friendly. Besides all of this, FIR 2.0 fulfils the tasks of previous software version. The developed software provides good basis for operational traffic management. The general and specific objectives of the project: ▪ Reduction of congestion ▪ Increase of safety ▪ Better informed infrastructure users (traffic and traveller information) were successfully achieved.
Impacts assessment / results (if available)	Will be carried out in the framework of CROCODILE 2.0_HU project, report will be available 2019 Q1.

ILLUSTRATIONS

Figure 1: Homepage of FIR 2.0

Figure 2: Data of subsystems on one screen in FIR 2.0

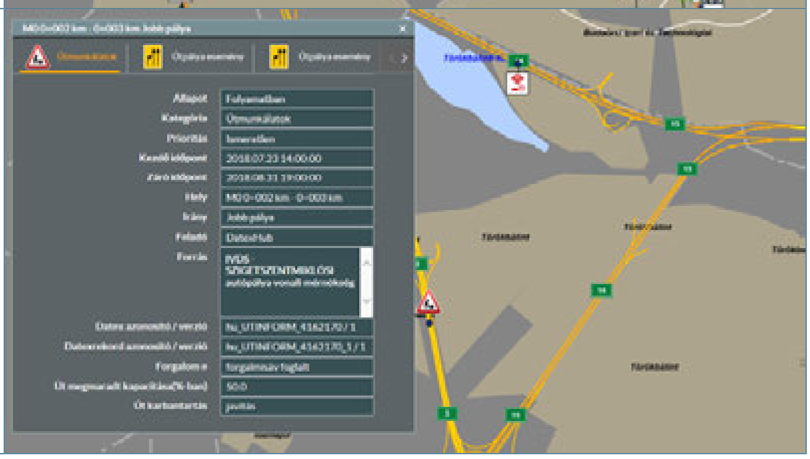


Figure 3: The view of new modules in FIR 2.0

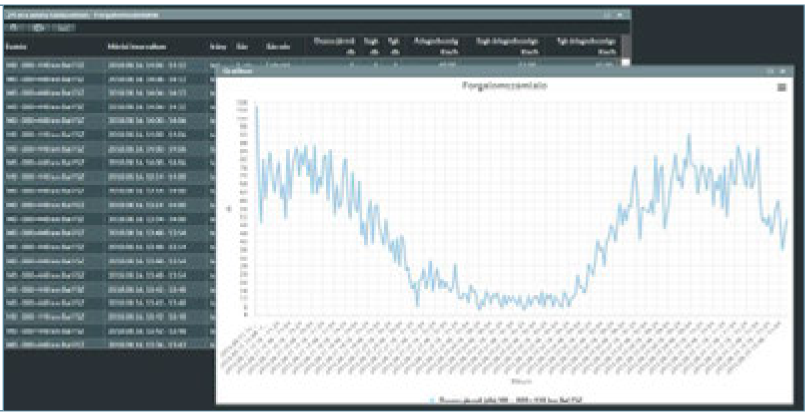


Figure 4: The view of statistical function in FIR 2.0

REFERENCES	
Documentation available on the project	
Web link	

1.2.6.11 Tyre Pressure Monitoring System

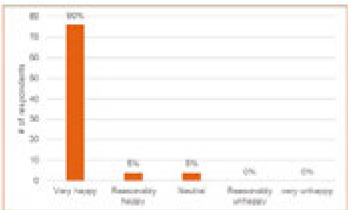
GENERAL INFORMATION	
Name of service/system/project	Tyre Pressure Monitoring System
Name of operator/organisation	Rijkswaterstaat (NL) and Verkeersonderneming (NL)
Service delivery	☒ Public ☐ Private
Mainly applicable Deployment Guideline	TMS-DG05 - Incident Warning and Management
Other relevant Deployment Guideline(s)	
Contact for more information	Jeroen Korving (Jeroen.korving@rws.nl)

GEOGRAPHICAL ASPECTS	
Country	The Netherlands
Region of implementation	Province of Zuid-Holland
Corridor(s) or Network(s) concerned	A16 motorway (North Sea – Baltic + North Sea – Mediterranean)

ITS SERVICE DESCRIPTION	
General Objectives	☒ Reduction of congestion ☒ Increase of safety ☐ Reduction of environmental damage ☐ Protection of the road infrastructure ☐ Increase traveller comfort ☐ Other

Specific Objectives	☐ Change the distribution in time of transport in order to achieve a more even allocation, avoiding peaks (access restrictions, fees) ☐ Change the distribution of transport in space in order to achieve a more even distribution on the network and prevent "wrong vehicles on wrong places" (traffic control, traffic management, traffic information, access restrictions) ☐ Change the composition of vehicles on a certain piece of infrastructure (access restrictions, fees) ☐ Manage the flow on a given road section in order to reduce speed variation and thus improve the capacity and reduce the risk of incidents ☐ Manage access to a given road section in order to prevent disturbances and reduce the risk of incidents (e.g. ramp metering) ☐ Increase the speed on the link and thus increase capacity (throughput) ☒ Reduce the risk of incidents and traffic disruptions through better informed infrastructure users (traffic and traveller information) ☐ Reduce the consequences from disruptions through fast countermeasures (incident response time) ☐ Reduce traffic volumes through redistributing transport between transport modes ☒ Other: Reduce the chance on incidents (flat tyres) of trucks by warning truck drivers and transport companies in case of low tyre pressure. Reducing the chance on incidents reduces the chance on congestion and improves road safety. Reduction of environmental damage. Protection of the road infrastructure.
Short narrative description of your best practice including e.g. geographical dimension, numbers, target group like HGV or passengers, costs etc.	Rijkswaterstaat (The national road and water management agency) has installed a tyre pressure measuring system for a one-year pilot on the A16 motorway, south of Rotterdam. The system detects flat tyres or tyres with extremely low tyre pressure at cruise speed. This is to prevent incidents with truck tyres, i.e. the risk of burst or flat tyres. This improves road safety and reduces congestion. This pilot is one of the five pilots of the URSA MAJOR neo project and is carried out jointly by Rijkswaterstaat and De Verkeersonderneming. **Market consultations** In April 2018, market consultations have been organised with transport insurance companies, tyre companies and transport companies. Participants showed a great interest and raised some relevant issues, e.g. when to warn the truck driver? How to warn the driver in a safe way? What options can we offer to the driver? How to inform the truck owner? **Installation and calibration** The measuring system was deployed May 2018. The supplier supported the first calibration on site. At a later stage the test location was moved to another location on the A16 motorway. The manufacturer had a lot of experience with common North American vehicle and tyre configurations. The system already could detect reliably flat tyres in a dual-tyre configuration. The typical European configuration with (super) single tyres requires some further calibration steps. Together with the supplier the measuring system was configured, so it can make reliable measurements for the following vehicle configurations:  **2nd and 3rd phase** During the 2nd phase the number of participating companies had increased to 122 with 24.900 license plates in the database. Rijkswaterstaat received various feedbacks on the reported deviations. In some cases the tyre pressure was only slightly too low. In most cases it appeared that there was a flat tyre or serious under-pressure. The first impression is that the reliability of the system is sufficient. In the 3rd phase new test drives are being undertaken with more than 150 companies and more than 30.000 license plates until mid 2020. Based on this the supplier will further optimize the system.

Relation with national access point set up according to EC Delegated Regulations	☐ Provide information to the national access point ☐ Receive information from the national access point ☒ No connection to the national access point
Information provision to end users	☐ Web portal ☐ Phone app ☐ VMS ☐ In-vehicle information ☒ Other: e-mail message to transport company. Potentially information could also be given to driver via VMS or in-car.

IMPLEMENTATION ASPECTS	
Year of implementation (+ end date of measure if applicable)	2018-2020
Technical description	Components: ▪ Induction loops for vehicle category and speed ▪ Measuring bars for measuring footprint of tires ▪ Roadside station for analysis measurements ▪ Cameras for truck identification ▪ Processing and storage system
Lessons learnt / factor of success / topics considered as good practice (technical, legal, organisational, financial)	Traffic congestion in the Netherlands is caused by various reasons. Approximately 10% of the yearly traffic-related time loss can be attributed to faulty trucks. A main reason for faulty trucks are tire-related problems. Regarding this, the Dutch Road Authority started, as part of the program 'Beter Benutten', a trial with a tire measurement system in May 2018 on the A16 motorway near Dordrecht. The project was carried out in collaboration with and on the initiative of the 'Verkeersonderneming'. The project is also part of the EU program Ursa Major Neo. The trial period ends after December 2020. Evaluation of the results and lessons learned are input for decision-making on a potential continuation of this trial. Conclusions First of all, the soundness and reliability of the measurement system has been validated. This was done by analyzing measurements and surveying participants (truck companies). We conclude that the measurement system provides sound measurements for the current settings at which it detects tires with a tire pressure of approximately 3 to 4 bars or less. In the conducted survey among participants, 92% of the respondents answered that received warnings by the system were correct in (nearly) all cases. This has been confirmed in several interviews. In addition, 90% of the participants answered to be very happy with the trial (see graph 1). During the analyzed period the system detected suspect tires at 1,1% of all passing trucks. Based on at least six tires per truck, the system detected suspect tires at, maximum, 0,2% of all passing tires. These percentages are in line with expert experience and are in line with the first experiences of another measurement system on the N279-road in the province of North-Brabant.  Graph 1 How happy were participants, in general, with their participation in the trial. Next, the effectiveness of the measurement system was validated: did the trial result in fewer tire-related incidents with trucks and in less congestion? Based on the available information it was not possible to answer this question unambiguously. It is our view that the system has functioned well and that participants were informed in a clear and timely fashion. Subsequently these companies responded adequately to the warnings from the system. More than 40% of the participating companies have the impression that participation in the trial has led to a decrease in the number of tire-related incidents within the own company. However, based on the analyzed sources, we were not able to confirm a national or regional downward trend in truck incidents as well as congestion with a high level of reliability. In the Rotterdam region (the directly influenced area of the tire measurement system) at least a few incidents appear to have been avoided and it is expected that also a few incidents have been avoided outside this region. An analysis of

	the congestion-data, however, does not reveal a convincing causal relationship. Therefore we expect the effect on congestion, both national as in the Rotterdam region, to have been very limited. This, however, does not alter the fact that the tire measurement system may have prevented a limited number of traffic jams. Finally, the evaluation focusses on the future of the tire measurement system. Note that this report does not draw any conclusions about the desirability of continuing the trial. Based on the evaluation we do conclude find that there are many arguments for continuation of the trial, but there are also several arguments against continuation. A global cost-benefit analysis shows that the benefits of the system, until so far, not have outweighed the costs. However, the impression is that this could be the case if the trial is continued for a longer period of time and the warning messages from the system could be sent to a significantly higher number of companies than in the current situation. During the course of the trial, an estimated average of 'only' 5% of the warning messages generated by the system could actually be sent to participating companies. Therefore, there is a great potential in increasing these numbers. As a consequence, a large part of the recommendations focusses on this. See below. Recommendations Maintain the currect location The trial has shown that the tire measurement system functions well on the current location. For the functioning of the system a great deal of investments has been made. Stopping or relocation would mean wasting these investments to al large extent. Furthermore, the A16 is, as a link between the ports of Rotterdam and Antwerp one of the busiest highways in the Netherlands concerning trucks. Stricten the system's threshold The current threshold of the system detects tires with a pressure of 3 to 4 bars or less. This is quite mild, as experts agree that tires with a pressure of 5 to 6 bars or less already should be taken care of. It is expected the system therefore does not detect a substantial amount of potentially 'bad' tires. In the fall of 2020 a new set of sensors has been installed. With these new sensors it is expected to be able to detect tires, soundly and reliably, with a pressure of 5 to 6 bars or less. Investigate the added value and cost-effectiveness of a DRIP and feedback via an app The tire measurement system trial on the N279-road communicates in a different way. Truckdrivers are informed via an information panel alongside the road. In addition, truckdrivers that use a certain app (TruckMeister) also receive feedback via that app. It is recommended to investigate whether these ways of communication would add value for the system on the A16. Start a campaign to recruit extra participants As mentioned before, during the course of the trial, an estimated average of 5% of the warning messages generated by the system could actually be sent to participating companies. When the trial should continue, this percentage, ideally, should go up significantly. The percentage of 5% is remarkably low, based on the great enthusiasm among the participating companies. It is our view that being unfamiliar with the trial is an important reason for a lot of companies to not have participated yet. It is recommended to start a campaign to recruit extra participants. Increase the frequency of feedback to participating companies Various participating companies indicated that they would also value feedback from the measurement system when their tire pressures are ok. The current system does not provide in that possibility as it is not technically capable of determining whether the tire pressure is good. However, it should be possible to realize that participating companies regularly get feedback about the system and its status. Facilitate management of license plate registration and contact persons Various participating companies indicated that it would be an improvement if it was easier to update their own information about trucks and contacts.
Impacts assessment / results (if available)	

ILLUSTRATIONS

	
	
Source: Rijkswaterstaat	

REFERENCES

Documentation available on the project	See link below.
Web link	Evaluation report phase 2: www.its-platform.eu/filedepot_download/2218/6564 A video of the pilot (only in Dutch): https://www.youtube.com/watch?v=xXwoxSmCl8U&app=desktop

1.2.7 TMS-07 Traffic Management for Corridors and Networks

1.2.7.1 dNetBY ("dynamic net control Bavaria") (Dynamic Re-Routing with travel-time-information)

GENERAL INFORMATION	
Name of service/system/project	dNetBY ("dynamic net control Bavaria") (Dynamic Re-Routing with travel-time-information)
Name of operator/organisation	Bavarian Road Administration (Autobahndirektionen Nord- und Südbayern)
Service delivery	☒ Public ☐ Private
Mainly applicable Deployment Guideline	TMS_Traffic Management Services
Other relevant Deployment Guideline(s)	TMS-DG07 – TRAFFIC MANAGEMENT PLAN FOR CORRIDORS AND NETWORKS
Contact for more information	zvm@abdsb.bayern.de

GEOGRAPHICAL ASPECTS	
Country	Germany
Region of implementation	Bavaria
Corridor(s) or Network(s) concerned	Ursa major, Bavarian freeway/autobahn-network

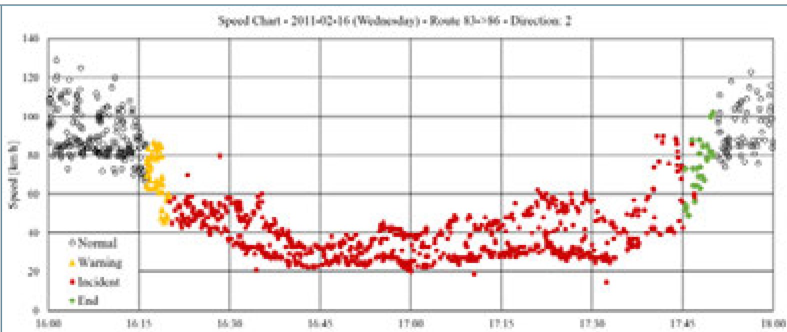
ITS SERVICE DESCRIPTION	
General Objectives	☒ Reduction of congestion ☐ Increase of safety ☐ Reduction of environmental damage ☐ Protection of the road infrastructure ☒ Increase traveller comfort ☐ Other
Specific Objectives	☒ Change the distribution in time of transport in order to achieve a more even allocation, avoiding peaks (access restrictions, fees) ☐ Change the distribution of transport in space in order to achieve a more even distribution on the network and prevent "wrong vehicles on wrong places" (traffic control, traffic management, traffic information, access restrictions) ☐ Change the composition of vehicles on a certain piece of infrastructure (access restrictions, fees) ☐ Manage the flow on a given road section in order to reduce speed variation and thus improve the capacity and reduce the risk of incidents ☐ Manage access to a given road section in order to prevent disturbances and reduce the risk of incidents (e.g. ramp metering) ☐ Increase the speed on the link and thus increase capacity (throughput) ☒ Reduce the risk of incidents and traffic disruptions through better informed infrastructure users (traffic and traveller information) ☒ Reduce the consequences from disruptions through fast countermeasures (incident response time) ☒ Reduce traffic volumes through redistributing transport between transport modes ☐ Other
Short narrative description of your best practice including e.g. geographical dimension, numbers, target group like HGV or passengers, costs etc.	The main objective of dNetBY is a dynamic re-routing system including travel-time-information. It is implemented in parts of the Bavarian motorway network.
Relation with national access point set up according to EC Delegated Regulations	☒ Provide information to the national access point ☐ Receive information from the national access point ☐ No connection to the national access point

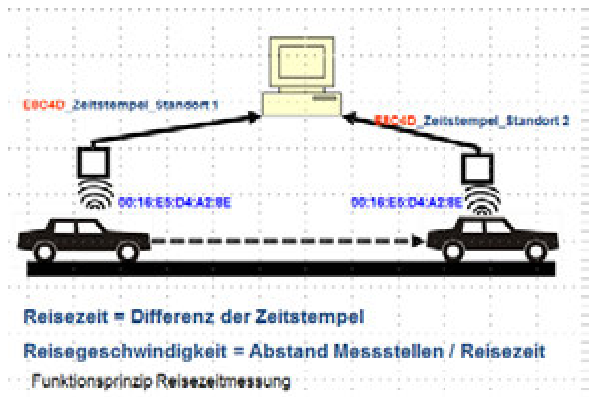
Information provision to end users	☐ Web portal ☐ Phone app ☒ VMS ☒ In-vehicle information ☐ Other

IMPLEMENTATION ASPECTS

Year of implementation (+ end date of measure if applicable)	December 2014 further steps in 2016 ff.
Technical description	At 24 panel sites on Bavarian freeways information and warning signs using LED technology, offering space for free text as well as for pictograms, are scheduled in the venture dNet Bayern ("dynamic net control Bavaria"). The network control system will divert traffic from major routes to alternative routes in case of congestion, capacity overload or accidents on a regional basis. The complex freeway network consists of 27 major and 60 alternative routes. The network control must be correspondingly complex. In order to achieve acceptance of concerned drivers it is crucial to have a quick and reliable incident detection as well as the ability to cancel recommended deviations promptly. The Bavarian freeway network consists of approximately 2200 kilometers. For economic reasons a network of this extent cannot be equipped with inductive loop sensors or radar traffic sensors in frequent intervals in order to achieve a fast and precise incident detection. These devices would have to be installed at each junction – i.e. around every five kilometers – or even in more frequent intervals for both directions of travel. Therefore, the objective of this research is to evaluate in a test site setup the potential of using (only) bluetooth detectors to establish a dynamic net control on Bavarian freeways. To detect the capacity overload in real-time it is necessary to get the travel-time-data very quickly, therefore a bluetooth-network has been installed (overall 100 detectors). In this network the opportunity is given to predict the travel-time very fast and in a good quality on the main and the alternative route. So the operating center is able to re-route the traffic by the displays.
Lessons learnt / factor of success / topics considered as good practice (technical, legal, organisational, financial)	These traffic-dependent dynamic displays with integrated information (dWiSta) work like a large TV. Information on re-routing and travel-time (loss) can be shown. If an incident (traffic jam, accident,…) is on the network, the road users get the necessary information (which is generated by the operating center) shown on the display in real-time. The approach on this technology is discussed and harmonized by the bavarian data protection officer (Bayerischen Landesbeauftragten für den Datenschutz). The clearance is given. This approach is a good benefit for the dynamic traffic management, because the data base is much bigger than local detection. Therefore travel-time can be predicted much better und the road administration can react by using the displays in case of incidents.
Impacts assessment / results (if available)	

ILLUSTRATIONS

example for an incident detection in Feb. 2011	

<table>
<tr><td>BT travel-time-measurement</td><td>
</td></tr>
<tr><td>Full matrix panel for flexible display</td><td></td></tr>
<tr><td></td><td>
</td></tr>
</table>

REFERENCES	
Documentation available on the project	
Web link	

1.2.7.2 INCA+

GENERAL INFORMATION	
Name of service/system/project	INCA+
Name of operator/organisation	Bavarian Road Administration (Autobahndirektionen Nord- und Südbayern), Zentralstelle Verkehrsmanagement (ZVM)
Service delivery	☒ Public ☐ Private
Mainly applicable Deployment Guideline	TMS_Traffic Management Services
Other relevant Deployment Guideline(s)	TMS_Variable Speed Limits TMS_Hard Shoulder Running TMS_Incident Warnung and Management TMS_HGV Overtaking Ban
Contact for more information	zvm@abdsb.bayern.de

GEOGRAPHICAL ASPECTS	
Country	Germany
Region of implementation	Bavaria
Corridor(s) or Network(s) concerned	ursa majo, Bavarian autobahn-network

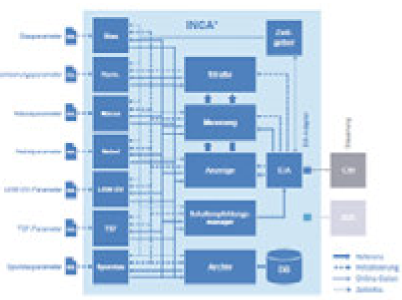
ITS SERVICE DESCRIPTION	
General Objectives	☒ Reduction of congestion ☒ Increase of safety ☐ Reduction of environmental damage ☐ Protection of the road infrastructure ☐ Increase traveller comfort ☐ Other
Specific Objectives	☐ Change the distribution in time of transport in order to achieve a more even allocation, avoiding peaks (access restrictions, fees) ☐ Change the distribution of transport in space in order to achieve a more even distribution on the network and prevent "wrong vehicles on wrong places" (traffic control, traffic management, traffic information, access restrictions) ☐ Change the composition of vehicles on a certain piece of infrastructure (access restrictions, fees) ☒ Manage the flow on a given road section in order to reduce speed variation and thus improve the capacity and reduce the risk of incidents ☒ Manage access to a given road section in order to prevent disturbances and reduce the risk of incidents (e.g. ramp metering) ☒ Increase the speed on the link and thus increase capacity (throughput) ☒ Reduce the risk of incidents and traffic disruptions through better informed infrastructure users (traffic and traveller information) ☒ Reduce the consequences from disruptions through fast countermeasures (incident response time) ☐ Reduce traffic volumes through redistributing transport between transport modes ☐ Other
Short narrative description of your best practice including e.g. geographical dimension, numbers, target group like HGV or passengers, costs etc.	Development of a new algorithm for lane control systems with a transparent and consistent operating-strategy
Relation with national access point set up according to EC Delegated Regulations	☒ Provide information to the national access point ☐ Receive information from the national access point ☐ No connection to the national access point

Information provision to end users	☐ Web portal ☐ Phone app ☒ VMS ☐ In-vehicle information ☐ Other

IMPLEMENTATION ASPECTS

Year of implementation (+ end date of measure if applicable)	since CORVETTE (2004/2005) new release in 2016/2017 as INCA+ (further modules where implemented e.g. weather, hard-shoulder-running)
Technical description	In Germany lane control systems (LCS) are an important component of the traffic infrastructure of motorways. They automatically adapt the permissible maximum speed to current traffic and weather conditions and warn road users in the case of traffic jams, fog, accidents and other risks. Ex-ante analyses have shown that the attainable effectiveness potentials amount to a reduction of traffic accidents by approximately 30%, accompanied by a simultaneous capacity increase of approximately 5 to 10%. In daily practice of using lane control systems, however, difficulties and deficiencies have recurred. These partly result from the deficient driver acceptance of preventive speed regulation but primarily from the complexity of the control procedures, which hardly any methods and instruments have been developed for to guarantee a systematic quality control. The objective function of INCA+ evaluates the effect of congestion warning and speed regulation on the basis of time series of historical signal indication and traffic data. The result is a financially measurable benefit of congestion warnings and speed regulation regarding traffic safety and travel time. The method is suitable for the evaluation of effectiveness, for quality control and for parameter optimization of lane control systems.
Lessons learnt / factor of success / topics considered as good practice (technical, legal, organisational, financial)	The research approach was very academic and the software code was not modular and scalable. For this reason a further development of the software was necessary. The current version of the software architecture has been changed to a modular structure and a well-documented framework, so the algorithms can be used on many stretches and can be provided as an open approach for other VMS control centers.
Impacts assessment / results (if available)	An evaluation of INCA+ is part of the project and presumably available in 2018.

ILLUSTRATIONS



VMS gantry near AS Allershausen (A9 driving direction Berlin), speed limit, HGV ban, hard shoulder running (closed)

REFERENCES

Documentation available on the project	
Web link	

1.2.7.3 LotranDQ2 and LotranDQ+ (software – quality control)

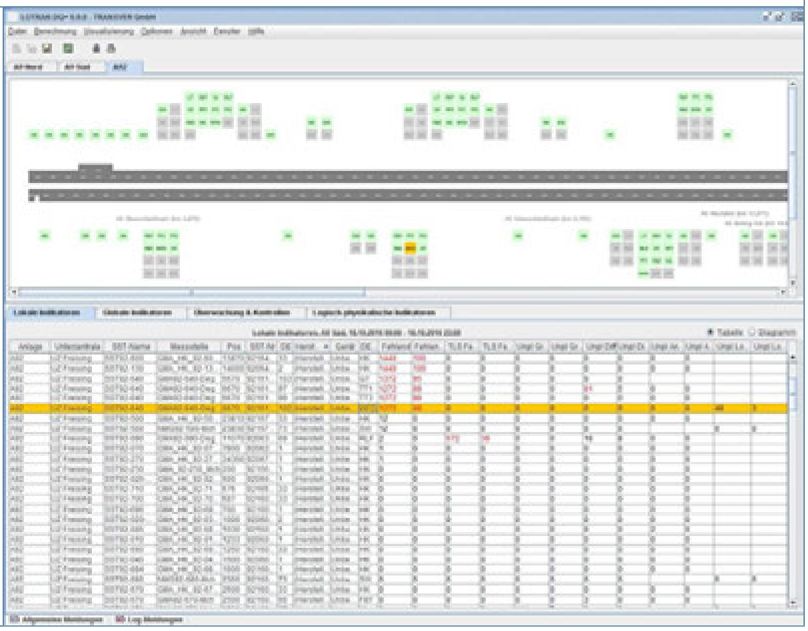
GENERAL INFORMATION	
Name of service/system/project	LotranDQ2 and LotranDQ+ (software – quality control)
Name of operator/organisation	Bavarian Road Administration (Autobahndirektionen Nord- und Südbayern), Zentralstelle Verkehrsmanagement (ZVM)
Service delivery	☒ Public ☐ Private
Mainly applicable Deployment Guideline	TMS_Traffic Management Services
Other relevant Deployment Guideline(s)	TMS_Variable Speed Limits
Contact for more information	TMS_Incident Warning and Management, zvm@abdsb.bayern.de

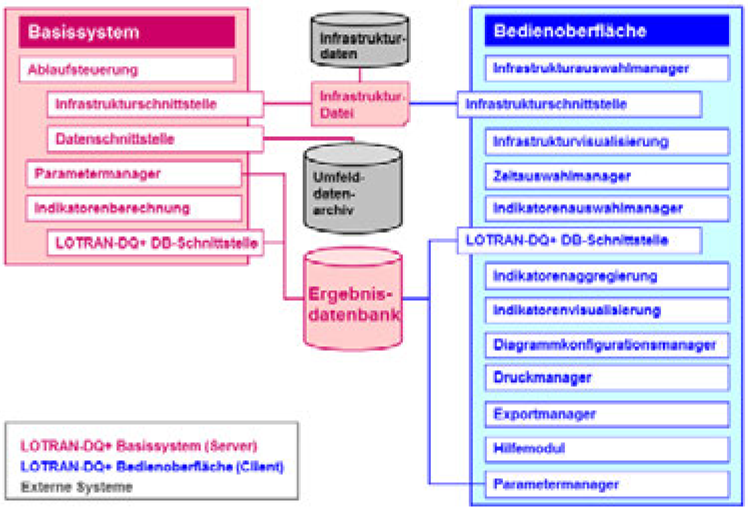
GEOGRAPHICAL ASPECTS	
Country	Germany
Region of implementation	Bavaria
Corridor(s) or Network(s) concerned	ursa major, Bavarian autobahn-network

ITS SERVICE DESCRIPTION	
General Objectives	☒ Reduction of congestion ☒ Increase of safety ☐ Reduction of environmental damage ☐ Protection of the road infrastructure ☐ Increase traveller comfort ☒ Other: data quality (traffic and weather)
Specific Objectives	☐ Change the distribution in time of transport in order to achieve a more even allocation, avoiding peaks (access restrictions, fees) ☐ Change the distribution of transport in space in order to achieve a more even distribution on the network and prevent “wrong vehicles on wrong places” (traffic control, traffic management, traffic information, access restrictions) ☐ Change the composition of vehicles on a certain piece of infrastructure (access restrictions, fees) ☒ Manage the flow on a given road section in order to reduce speed variation and thus improve the capacity and reduce the risk of incidents ☐ Manage access to a given road section in order to prevent disturbances and reduce the risk of incidents (e.g. ramp metering) ☐ Increase the speed on the link and thus increase capacity (throughput) ☒ Reduce the risk of incidents and traffic disruptions through better informed infrastructure users (traffic and traveller information) ☐ Reduce the consequences from disruptions through fast countermeasures (incident response time) ☐ Reduce traffic volumes through redistributing transport between transport modes ☐ Other
Short narrative description of your best practice including e.g. geographical dimension, numbers, target group like HGV or passengers, costs etc.	Road weather and traffic detection is very important for online traffic control within section control systems. Variable message signs are used to increase traffic safety based on the current traffic and weather data. Dynamic variable message signs give warnings to road users about critical road area conditions. Such warnings can only have a positive effect on traffic safety if the variable message signs are adhered by the road users. Therefore it is important to reach a high quality concerning the collected data and a well description of the current situation. For this reason the software Lotran DQ was developed. The main aim of this software is to enable a quality control of the collected traffic and weather data on a continuous basis.
Relation with national access point set up according to EC Delegated Regulations	☒ Provide information to the national access point ☐ Receive information from the national access point ☐ No connection to the national access point

Information provision to end users	☐ Web portal ☐ Phone app ☒ VMS ☐ In-vehicle information ☐ Other

IMPLEMENTATION ASPECTS	
Year of implementation (+ end date of measure if applicable)	LotranDQ2 (since 2006) – traffic data LotranDQ+ (2017) – weather data
Technical description	The first software release of LotranDQ was implemented in 2003 in VRZ Freimann and was online since 2004. The software enables the daily quality control of all detectors in the south bavarian network. It was possible to improve the data quality and quantity in the whole system. LotranDQ is now in two versions available. In LotranDQ2 traffic data are monitored and in LotranDQ+ the technical staff in the control center can observe the weather data quality.
Lessons learnt / factor of success / topics considered as good practice (technical, legal, organisational, financial)	For good results in the operating VMS-systems it is necessary to have high quality control software in an efficient way. The overview of all needed data is very important for the productive systems and there performance. The graphic user interface (front end) should offer an easy entry to the operational data quality.
Impacts assessment / results (if available)	

ILLUSTRATIONS	
GUI (front end)	

SW-architecture (server-client)	

REFERENCES	
Documentation available on the project	
Web link	

1.2.7.4 Re-routing corridor West (LISA)

GENERAL INFORMATION	
Name of service/system/project	Re-routing corridor West (LISA)
Name of operator/organisation	Verkehrszentrale Hessen (Traffic Centre Hessen, VZH), Landesmeldestelle Rhineland-Palatinate, Traffic Centre North Rhine-Westphalia
Service delivery	☒ Public ☐ Private
Mainly applicable Deployment Guideline	TMS-DG 07 - Traffic Management Plan for Corridors and Networks
Other relevant Deployment Guideline(s)	
Contact for more information	www.mobil.hessen.de/kontakt

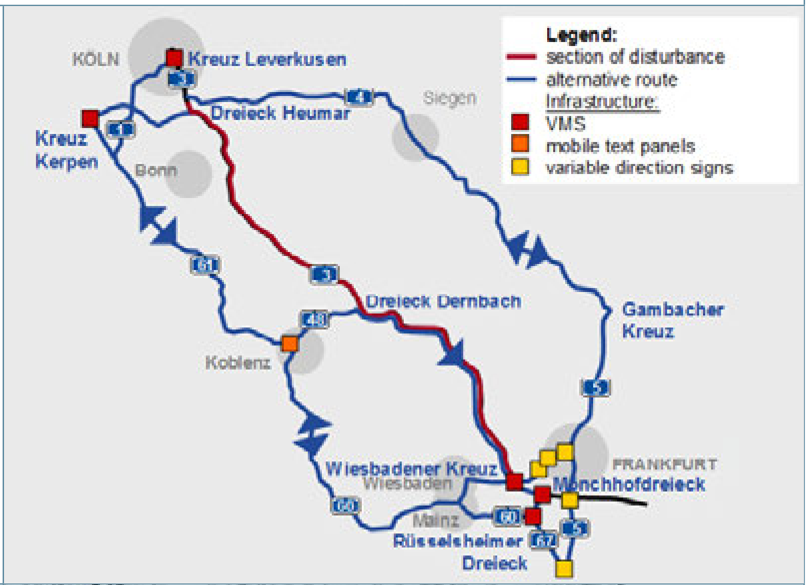
GEOGRAPHICAL ASPECTS	
Country	Germany
Region of implementation	Hesse, Rhineland-Palatinate, North Rhine-Westphalia
Corridor(s) or Network(s) concerned	URSA MAJOR 2

ITS SERVICE DESCRIPTION	
General Objectives	☒ Reduction of congestion ☐ Increase of safety ☐ Reduction of environmental damage ☐ Protection of the road infrastructure ☒ Increase traveller comfort ☒ Other: Equal distribution of traffic in motorway network

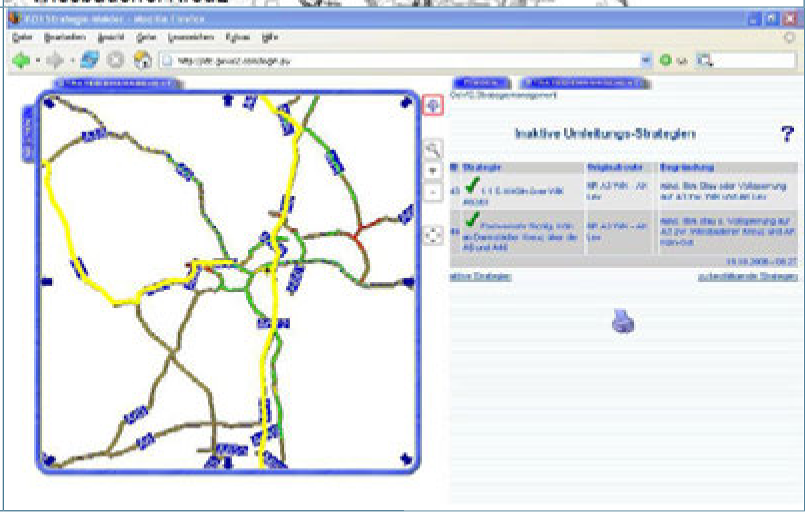
Specific Objectives	☐ Change the distribution in time of transport in order to achieve a more even allocation, avoiding peaks (access restrictions, fees) ☒ Change the distribution of transport in space in order to achieve a more even distribution on the network and prevent "wrong vehicles on wrong places" (traffic control, traffic management, traffic information, access restrictions) ☐ Change the composition of vehicles on a certain piece of infrastructure (access restrictions, fees) ☐ Manage the flow on a given road section in order to reduce speed variation and thus improve the capacity and reduce the risk of incidents ☐ Manage access to a given road section in order to prevent disturbances and reduce the risk of incidents (e.g. ramp metering) ☐ Increase the speed on the link and thus increase capacity (throughput) ☒ Reduce the risk of incidents and traffic disruptions through better informed infrastructure users (traffic and traveller information) ☒ Reduce the consequences from disruptions through fast countermeasures (incident response time) ☐ Reduce traffic volumes through redistributing transport between transport modes ☐ Other
Short narrative description of your best practice including e.g. geographical dimension, numbers, target group like HGV or passengers, costs etc.	In case of a disturbance on the defined section the road user will be re-routed via VMS and radio. Main route: A3 between Frankfurt and Cologne (in both directions) Section of disturbance:A3 between Interchange Wiesbaden and interchange Dernbach or A3 between interchange Dernbach and interchange Cologne Alternative route: A60/ A61 or A5/A45/A4
Relation with national access point set up according to EC Delegated Regulations	☒ Provide information to the national access point ☐ Receive information from the national access point ☐ No connection to the national access point
Information provision to end users	☐ Web portal ☐ Phone app ☒ VMS ☐ In-vehicle information ☒ Other: Radio

IMPLEMENTATION ASPECTS	
Year of implementation (+ end date of measure if applicable)	2006
Technical description	The states and road operators of Hesse, Rhineland-Palatinate and North Rhine-Westphalia expected above average growth of passenger and freight traffic traffic demand in future on the North-South axes A 3, A 45, and A 61. The road operator decided to install establish (construct) a TMP in 2006. The TMP was expanded in 2009. To simplify the decision process for rerouting a TPM a Web application for strategy management (ISM) has been developed and used. This tool helps to design and apply predefined strategies by multiple partners in a semi-automatic way. The information about rerouting measures is displayed via VMS and variable direction signs.
Lessons learnt / factor of success / topics considered as good practice (technical, legal, organisational, financial)	The development and maintenance of an agreed upon list of pre-defined strategies and procedures based on an assessment of needs and resources is the essential element of the success and fast practicability of the project. In future stages coordination with concurrent TMPs on local or conurbation level may be included. Due to the integration of the strategy negotiation software into the varying systemic and organisational environments of a multitude of Traffic Control Centres, initial challenges regarding the swiftness of usage/reaction had to be overcome. It should be noted that the increase of communication between the TCCs lead to a more frequent and intense exchange of experience about traffic management overall and therefore created positive side effects
Impacts assessment / results (if available)	Due to the high variance of traffic events during the initial pilot phase a long-term observation was deemed necessary. Currently each of the German LISA-Corridors holds two workshops a year, evaluating the preceding events and effectiveness of measures ensued.

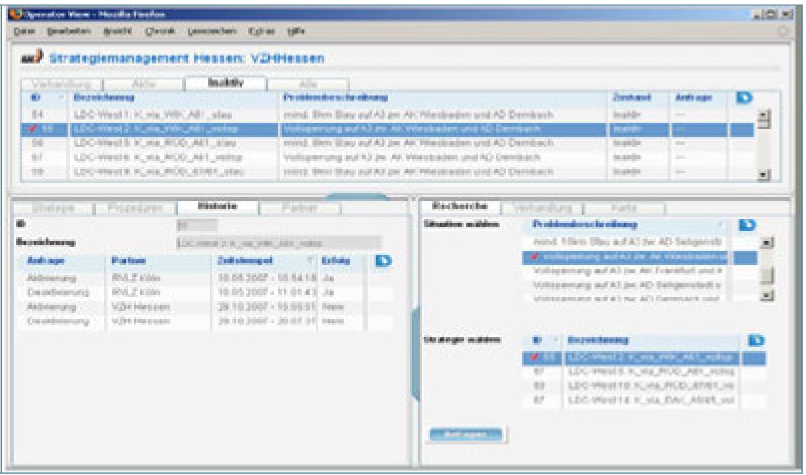
ILLUSTRATIONS



Example of VMS-display during the strategy activation



Example for strategy coordination via e-mail. Strategy overview of the TMP corridor west on the interface of the strategy client (marked in red: icon for strategy coordination)

Example of web-based communication tool: CSM approach of Hessen,Germany	

REFERENCES	
Documentation available on the project	
Web link	

1.2.7.5 TMP Brenner Corridor (Austria, Germany, Italy)

GENERAL INFORMATION	
Name of service/system/project	TMP Brenner Corridor (Austria, Germany, Italy)
Name of operator/organisation	Autostrada del Brennero (I) / Asfinag (A) / Bavarian Ministry of Interior (D)
Service delivery	☒ Public ☐ Private
Mainly applicable Deployment Guideline	ITS-DG-2015_TMS-DG07_TrafficManagementPlanForCorridorsandNetworks
Other relevant Deployment Guideline(s)	
Contact for more information	ilaria.debiasi@autobrennero.it

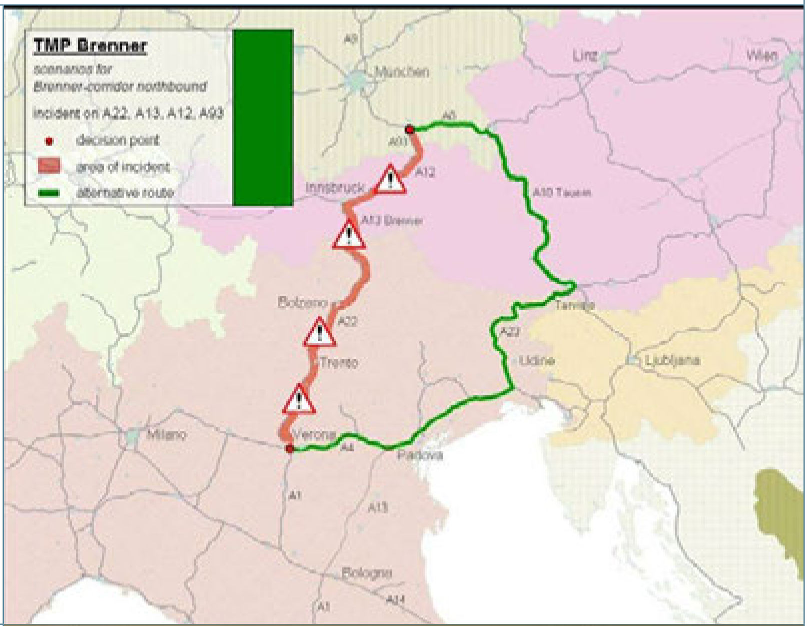
GEOGRAPHICAL ASPECTS	
Country	Germany / Austria / Italy
Region of implementation	
Corridor(s) or Network(s) concerned	A 93 and A8 (Bavaria) / A13/A12 and A10/A2 (Austria) / A22 and A23/A4 (Italy)

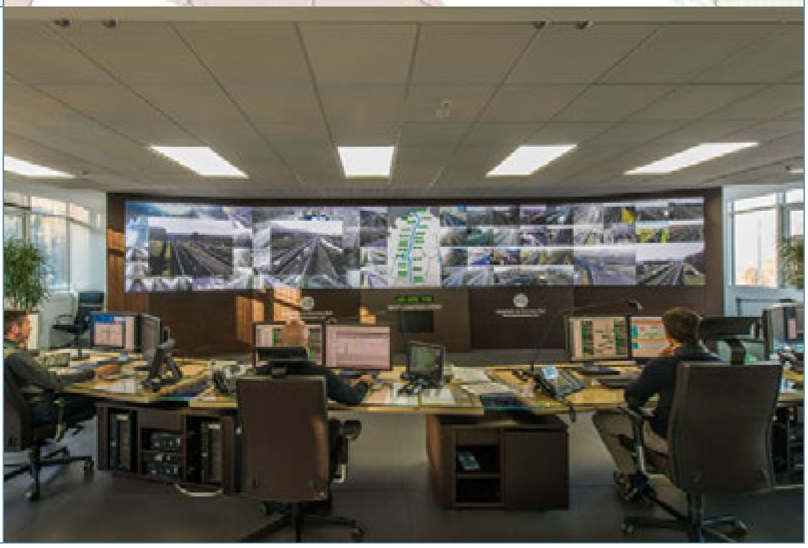
ITS SERVICE DESCRIPTION	
General Objectives	☒ Reduction of congestion ☒ Increase of safety ☐ Reduction of environmental damage ☐ Protection of the road infrastructure ☒ Increase traveller comfort ☐ Other

Specific Objectives	☐ Change the distribution in time of transport in order to achieve a more even allocation, avoiding peaks (access restrictions, fees) ☒ Change the distribution of transport in space in order to achieve a more even distribution on the network and prevent "wrong vehicles on wrong places" (traffic control, traffic management, traffic information, access restrictions) ☐ Change the composition of vehicles on a certain piece of infrastructure (access restrictions, fees) ☐ Manage the flow on a given road section in order to reduce speed variation and thus improve the capacity and reduce the risk of incidents ☐ Manage access to a given road section in order to prevent disturbances and reduce the risk of incidents (e.g. ramp metering) ☐ Increase the speed on the link and thus increase capacity (throughput) ☒ Reduce the risk of incidents and traffic disruptions through better informed infrastructure users (traffic and traveller information) ☒ Reduce the consequences from disruptions through fast countermeasures (incident response time) ☐ Reduce traffic volumes through redistributing transport between transport modes ☐ Other
Short narrative description of your best practice including e.g. geographical dimension, numbers, target group like HGV or passengers, costs etc.	The TMP for the Brenner Corridor just involves the corridor southbound and in particular different motorway stretches in Germany, Austria and Italy. The motorways involved in the main route or Brenner route (Inntaldreieck - Verona via Innsbruck) are the A93 in Germany, the A12 and the A13 in Austria and the A22 in Italy. The motorways involved in the alternative route or Tarvisio route (Inntaldreieck - Verona via Tarvisio) are the A8 in Germany, the A1, A10 and A2 in Austria and the A23 and A4 in Italy. The main route is 362 km long, whereas the alternative route is 618 km long. The average travel time on the main route is 4,5 hours for HGVs and 3 hours for passenger cars. All motorways are two-lane motorways with a maximum capacity of approximately 3.000 vehicles per hour. The target group of the project are HGV drivers.
Relation with national access point set up according to EC Delegated Regulations	☐ Provide information to the national access point ☐ Receive information from the national access point ☒ No connection to the national access point
Information provision to end users	☒ Web portal ☒ Phone app ☒ VMS ☐ In-vehicle information ☒ Other: radio, RDS-TMC, television

IMPLEMENTATION ASPECTS	
Year of implementation (+ end date of measure if applicable)	2006
Technical description	The Traffic Management Plan is activated in case of accidents, bad weather conditions, road works or HGV restrictions occurring anywhere along the Corridor A93 – A12 – A13 – A22). Different scenarios have been identified varying according to the spatial application of the event (critical event on the German, Austrian or Italian motorway network). Thresholds for the activation have been also set in order to identify the events to be considered to impact on the neighbouring networks: thresholds can refer to the length of a traffic block, to the duration of a road closure or to the type of weather event occurring. According to the event occurring and to the impact that this event might have on traffic and users safety the associated measure can vary from simple "information" or to "information and re-routing advice". Once an event occurs on a network, the road operators of the neighbouring networks have to be informed. The latter must officially confirm the decision taken by the road operator on whose network the event occurs and the TMP can be activated. The same procedure has to be applied in case of deactivation of the measure.
Lessons learnt / factor of success / topics considered as good practice (technical, legal, organisational, financial)	The measure hasn't been activated many times so far. The few times where it has been applied it was due to heavy snowfalls or to important road works at cross-border level (or near the border) and implied just information at cross-border level. The information flow worked well in both cases. The fact of having a defined protocol and to have identified the right person / TCC to contact surely eases communication between operators and reduces the intervention times in case of emergency.
Impacts assessment / results (if available)	

ILLUSTRATIONS





Traffic Control and Management Centre of Autostrada del Brennero

REFERENCES

Documentation available on the project	▪ Memorandum of Understanding ▪ Verkehrsmanagementplan für die Korridore Brenner und Tauern (Fortschreibung des CORVETTE Traffic-Managementplanes Brenner für die Fahrtrichtung Süden)
Web link	none

1.2.7.6 TMP Phyrn Corridor

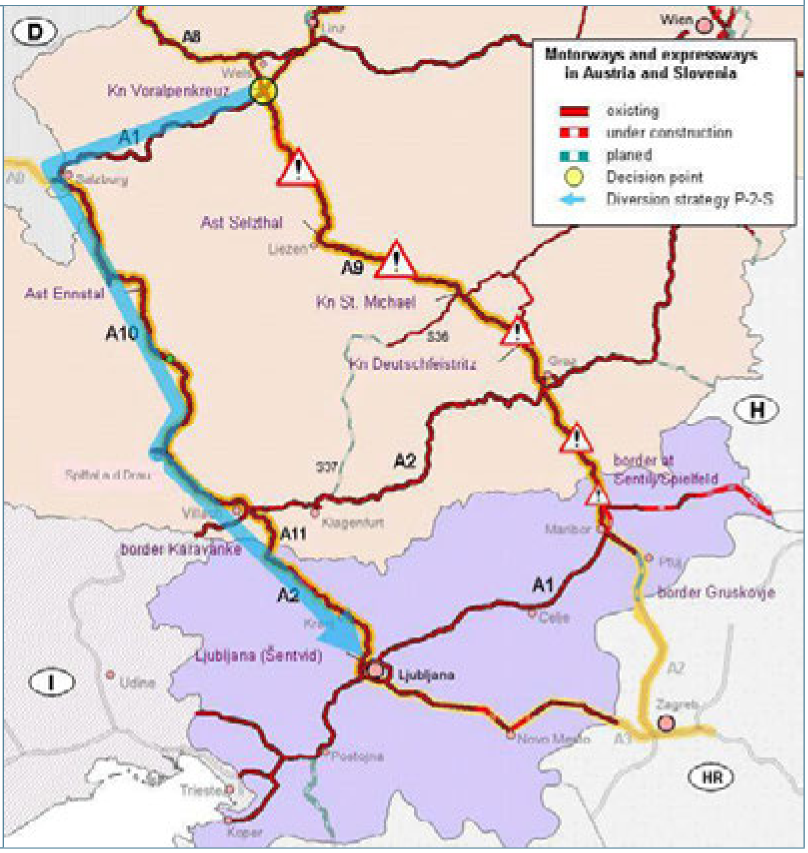
GENERAL INFORMATION	
Name of service/system/project	TMP Phyrn Corridor
Name of operator/organisation	ASFINAG Service GmbH
Service delivery	☒ Public ☐ Private
Mainly applicable Deployment Guideline	TMS-DG07 TRAFFIC MANAGEMENT PLAN SERVICE FOR CORRIDORS AND NETWORKS
Other relevant Deployment Guideline(s)	-
Contact for more information	trafficmanager@asfinag.at

GEOGRAPHICAL ASPECTS	
Country	Austria, Slovenia, Croatia
Region of implementation	Phyrn-Corridor (Wels – Graz – Maribor)
Corridor(s) or Network(s) concerned	TEN-T Road Network: A09(A) / A01(SLO)

ITS SERVICE DESCRIPTION	
General Objectives	☒ Reduction of congestion ☒ Increase of safety ☐ Reduction of environmental damage ☐ Protection of the road infrastructure ☒ Increase traveller comfort ☒ Other: Reroute HGV traffic between Austria, Slovenia and Croatia from tauernmotorway (A10) through phyrnmotorway (A9)
Specific Objectives	☐ Change the distribution in time of transport in order to achieve a more even allocation, avoiding peaks (access restrictions, fees) ☒ Change the distribution of transport in space in order to achieve a more even distribution on the network and prevent "wrong vehicles on wrong places" (traffic control, traffic management, traffic information, access restrictions) ☒ Change the composition of vehicles on a certain piece of infrastructure (access restrictions, fees) ☐ Manage the flow on a given road section in order to reduce speed variation and thus improve the capacity and reduce the risk of incidents ☐ Manage access to a given road section in order to prevent disturbances and reduce the risk of incidents (e.g. ramp metering) ☐ Increase the speed on the link and thus increase capacity (throughput) ☒ Reduce the risk of incidents and traffic disruptions through better informed infrastructure users (traffic and traveller information) ☐ Reduce the consequences from disruptions through fast countermeasures (incident response time) ☐ Reduce traffic volumes through redistributing transport between transport modes ☐ Other
Short narrative description of your best practice including e.g. geographical dimension, numbers, target group like HGV or passengers, costs etc.	Successful example: Full road closer in consequence of an accident on the Austrian motorway A09. (18.07.2011) TMP had been successfully activated until the motorway had been cleaned and reopened for traffic after 8h.
Relation with national access point set up according to EC Delegated Regulations	☐ Provide information to the national access point ☐ Receive information from the national access point ☒ No connection to the national access point
Information provision to end users	☒ Web portal ☒ Phone app ☒ VMS ☐ In-vehicle information ☐ Other

IMPLEMENTATION ASPECTS	
Year of implementation (+ end date of measure if applicable)	February, 2009
Technical description	Information of rerouting through Tauern-route on: Variable message signs, Variable direction signs, Radio broadcasts, ASFINAG website and ASFINAG app
Lessons learnt / factor of success / topics considered as good practice (technical, legal, organisational, financial)	Adaption from fax to digital fax via email. Telephonic contact is essential to avoid communication difficulties and to force effective implementation. TMPs have proved to be succsessfull due to unplanned closures, extreme weather conditions, urgent road works or other restrictions.
Impacts assessment / results (if available)	-

ILLUSTRATIONS



REFERENCES	
Documentation available on the project	Description of TMP Phyrn_ASFINAG for internal use
Web link	-

1.2.7.7 TMP Tauern Karawanken Corridor

GENERAL INFORMATION	
Name of service/system/project	TMP Tauern Karawanken Corridor
Name of operator/organisation	ASFINAG Service GmbH
Service delivery	☒ Public ☐ Private
Mainly applicable Deployment Guideline	TMS-DG07 TRAFFIC MANAGEMENT PLAN SERVICE FOR CORRIDORS AND NETWORKS
Other relevant Deployment Guideline(s)	-
Contact for more information	trafficmanager@asfinag.at

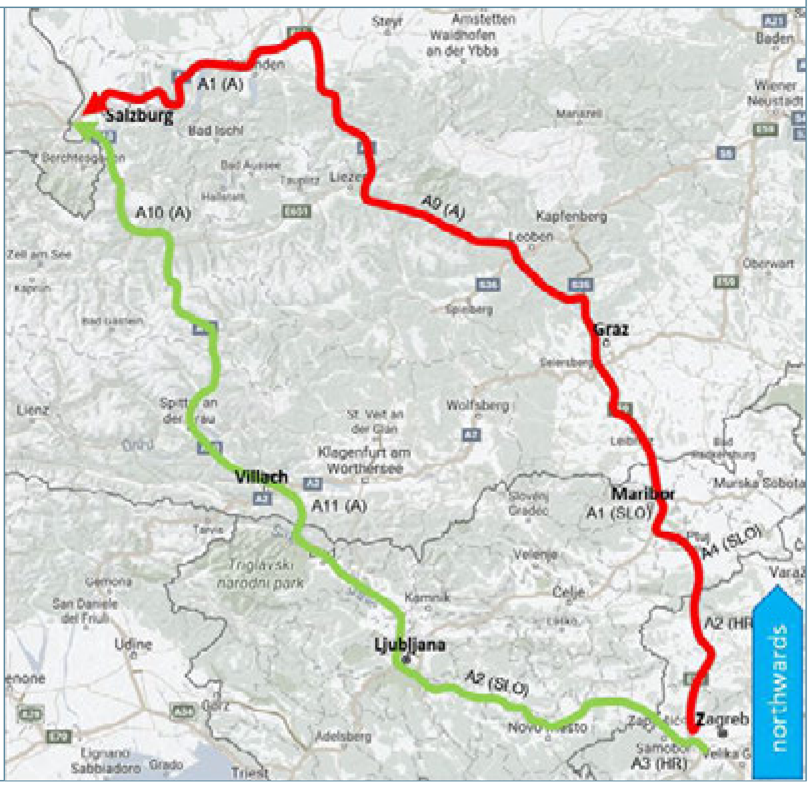
GEOGRAPHICAL ASPECTS	
Country	Austria, Slovenia, Croatia
Region of implementation	Tauern-Karawanken-Corridor (Salzburg – Ljubljana – Zagreb)
Corridor(s) or Network(s) concerned	TEN-T Road Network: A10(A) / A11(A) / A2(SLO) / A3(HR)

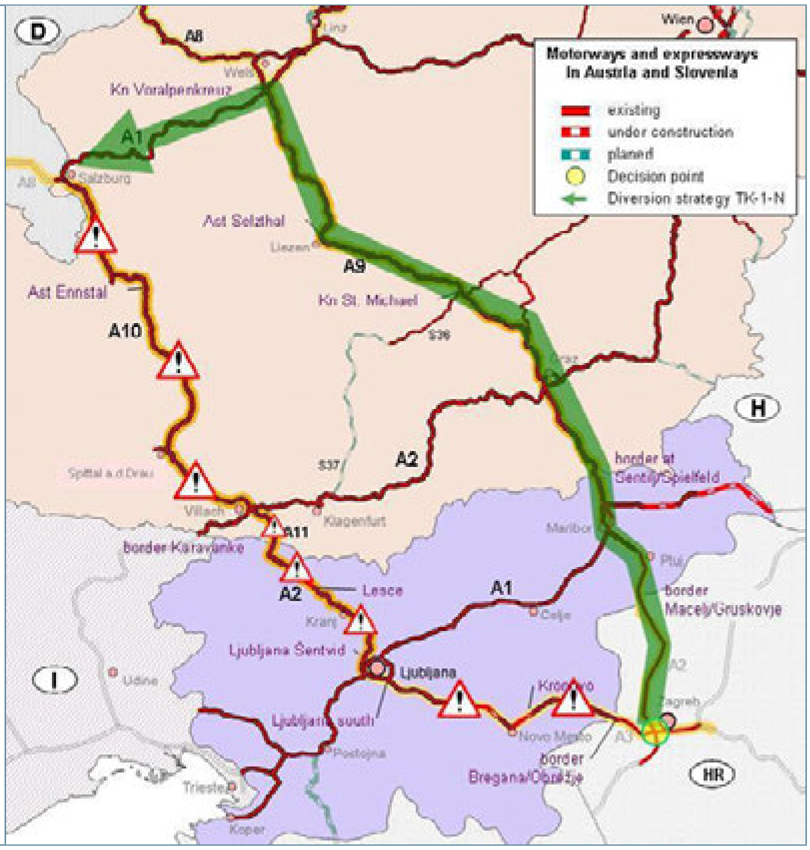
ITS SERVICE DESCRIPTION	
General Objectives	☒ Reduction of congestion ☒ Increase of safety ☐ Reduction of environmental damage ☐ Protection of the road infrastructure ☒ Increase traveller comfort ☒ Other: Reroute HGV traffic between Austria, Slovenia and Croatia from tauernmotorway (A10) through phyrnmotorway (A9)
Specific Objectives	☐ Change the distribution in time of transport in order to achieve a more even allocation, avoiding peaks (access restrictions, fees) ☒ Change the distribution of transport in space in order to achieve a more even distribution on the network and prevent “wrong vehicles on wrong places” (traffic control, traffic management, traffic information, access restrictions) ☒ Change the composition of vehicles on a certain piece of infrastructure (access restrictions, fees) ☐ Manage the flow on a given road section in order to reduce speed variation and thus improve the capacity and reduce the risk of incidents ☐ Manage access to a given road section in order to prevent disturbances and reduce the risk of incidents (e.g. ramp metering) ☐ Increase the speed on the link and thus increase capacity (throughput) ☒ Reduce the risk of incidents and traffic disruptions through better informed infrastructure users (traffic and traveller information) ☐ Reduce the consequences from disruptions through fast countermeasures (incident response time) ☐ Reduce traffic volumes through redistributing transport between transport modes ☐ Other
Short narrative description of your best practice including e.g. geographical dimension, numbers, target group like HGV or passengers, costs etc.	Successful example: Full road closer in consequence of a mudflow on the Austrian motorway A10. (22.06.2012) TMP had been activated successfully until the mudflow could be removed and the motorway had been cleaned and reopened for traffic after 30h.
Relation with national access point set up according to EC Delegated Regulations	☐ Provide information to the national access point ☐ Receive information from the national access point ☒ No connection to the national access point

Information provision to end users	☒ Web portal ☒ Phone app ☒ VMS ☐ In-vehicle information ☐ Other

IMPLEMENTATION ASPECTS	
Year of implementation (+ end date of measure if applicable)	January, 2009
Technical description	Information of rerouting through Pyhrn-route on: Variable message signs, Variable direction signs, Radio broadcasts, ASFINAG website and ASFINAG app
Lessons learnt / factor of success / topics considered as good practice (technical, legal, organisational, financial)	Adaption from fax to digital fax via email. Telephonic contact is essential to avoid communication difficulties and to force effective implementation. TMPs have proved to be succsessfull due to unplanned closures, extreme weather conditions, urgent road works or other restrictions.
Impacts assessment / results (if available)	-

ILLUSTRATIONS





REFERENCES	
Documentation available on the project	Description of TMP Tauern-Karawanken_ASFINAG for internal use
Web link	-

1.3

F&LS - Freight & Logistic services

1.3 F&LS - Freight & Logistic Services

1.3.1 F&LS-01 Intelligent and Secure Truck parking

11.3.1.1 Border crossing pre-booking and queuing service

GENERAL INFORMATION	
Name of service/system/project	Border crossing pre-booking and queuing service
Name of operator/organisation	Traffic Management Finland Group (state-owned company responsible for traffic management
Service delivery	☒ Public ☐ Private
Mainly applicable Deployment Guideline	FLS-DG01 - Intelligent Truck Parking and Secure Truck Parking
Other relevant Deployment Guideline(s)	
Contact for more information	Jyrki Järvinen, jyrki.jarvinen@tmfg.fi

GEOGRAPHICAL ASPECTS	
Country	Finland
Region of implementation	South-East
Corridor(s) or Network(s) concerned	TEN-T Scandinavian – Mediterranean Corridor

ITS SERVICE DESCRIPTION	
General Objectives	☒ Reduction of congestion ☒ Increase of safety ☒ Reduction of environmental damage ☐ Protection of the road infrastructure ☒ Increase traveller comfort ☐ Other
Specific Objectives	☒ Change the distribution in time of transport in order to achieve a more even allocation, avoiding peaks (access restrictions, fees) ☒ Change the distribution of transport in space in order to achieve a more even distribution on the network and prevent "wrong vehicles on wrong places" (traffic control, traffic management, traffic information, access restrictions) ☐ Change the composition of vehicles on a certain piece of infrastructure (access restrictions, fees) ☐ Manage the flow on a given road section in order to reduce speed variation and thus improve the capacity and reduce the risk of incidents ☐ Manage access to a given road section in order to prevent disturbances and reduce the risk of incidents (e.g. ramp metering) ☐ Increase the speed on the link and thus increase capacity (throughput) ☐ Reduce the risk of incidents and traffic disruptions through better informed infrastructure users (traffic and traveller information) ☐ Reduce the consequences from disruptions through fast countermeasures (incident response time) ☐ Reduce traffic volumes through redistributing transport between transport modes ☐ Other
Short narrative description of your best practice including e.g. geographical dimension, numbers, target group like HGV or passengers, costs etc.	Mandatory and free of charge pre-booking and queueing service for trucks going from Finland to Russia via Vaalimaa border crossing point.

Relation with national access point set up according to EC Delegated Regulations	☐ Provide information to the national access point ☐ Receive information from the national access point ☒ No connection to the national access point
Information provision to end users	☒ Web portal ☐ Phone app ☒ VMS ☐ In-vehicle information ☒ Other: SMS

IMPLEMENTATION ASPECTS

Year of implementation (+ end date of measure if applicable)	2014 - 2020
Technical description	Trucks going from Finland to Russia can book a time slot for border crossing through service website or by phone. The system identifies the truck when it arrives into the truck park. At pre-reserved time truck's licence plate number is shown in the screen and driver also gets SMS, which means driver has a permission to drive to Customs yard. Driver may also enter live queue, which means that he will be called to Customs if there are no pre-booked trucks to go.
Lessons learnt / factor of success / topics considered as good practice (technical, legal, organisational, financial)	Automatic identification of trucks is difficult. Operating this kind of system without human operator is also difficult. Knowing the border crossing time makes drivers and transport companies life easier and more efficient. With this kind of system we can guarantee stable flow of vehicles.
Impacts assessment / results (if available)	Order in truck park is better and there is less pollution. Drivers can better manage their rest time. Since the amount of trucks has decreased with 50% since 2008, we have not been able to test the queue reduction.

ILLUSTRATIONS

REFERENCES

Documentation available on the project	
Web link	https://www.evpa.fi/yphis/index.action?request_locale=en

1.3.1.2 CO-GISTICS (Cooperative logistics for sustainable mobility of goods)

GENERAL INFORMATION	
Name of service/system/project	CO-GISTICS (Cooperative logistics for sustainable mobility of goods)
Name of operator/organisation	ERTICO – ITS Europe
Service delivery	☐ Public ☒ Private
Mainly applicable Deployment Guideline	FLS-DG01: Intelligent Truck Parking and Secure Truck Parking
Other relevant Deployment Guideline(s)	
Contact for more information	Coordination: Lina Konstantinopoulou – Project Coordinator Email: l.konstantinopoulou@mail.ertico.com Manuela Flachi – Project Support Manager Email: m.flachi@mail.ertico.com

GEOGRAPHICAL ASPECTS	
Country	Romania, France, Spain, Germany, Greece, Italy
Region of implementation	Europe
Corridor(s) or Network(s) concerned	n.a.

ITS SERVICE DESCRIPTION	
General Objectives	☐ Reduction of congestion ☐ Increase of safety ☒ Reduction of environmental damage ☐ Protection of the road infrastructure ☐ Increase traveller comfort ☒ Other: implement co-operative intelligent transport systems to freight and logistics
Specific Objectives	☐ Change the distribution in time of transport in order to achieve a more even allocation, avoiding peaks (access restrictions, fees) ☐ Change the distribution of transport in space in order to achieve a more even distribution on the network and prevent "wrong vehicles on wrong places" (traffic control, traffic management, traffic information, access restrictions) ☐ Change the composition of vehicles on a certain piece of infrastructure (access restrictions, fees) ☐ Manage the flow on a given road section in order to reduce speed variation and thus improve the capacity and reduce the risk of incidents ☐ Manage access to a given road section in order to prevent disturbances and reduce the risk of incidents (e.g. ramp metering) ☐ Increase the speed on the link and thus increase capacity (throughput) ☐ Reduce the risk of incidents and traffic disruptions through better informed infrastructure users (traffic and traveller information) ☐ Reduce the consequences from disruptions through fast countermeasures (incident response time) ☐ Reduce traffic volumes through redistributing transport between transport modes ☒ Other: reduce CO_2 emissions

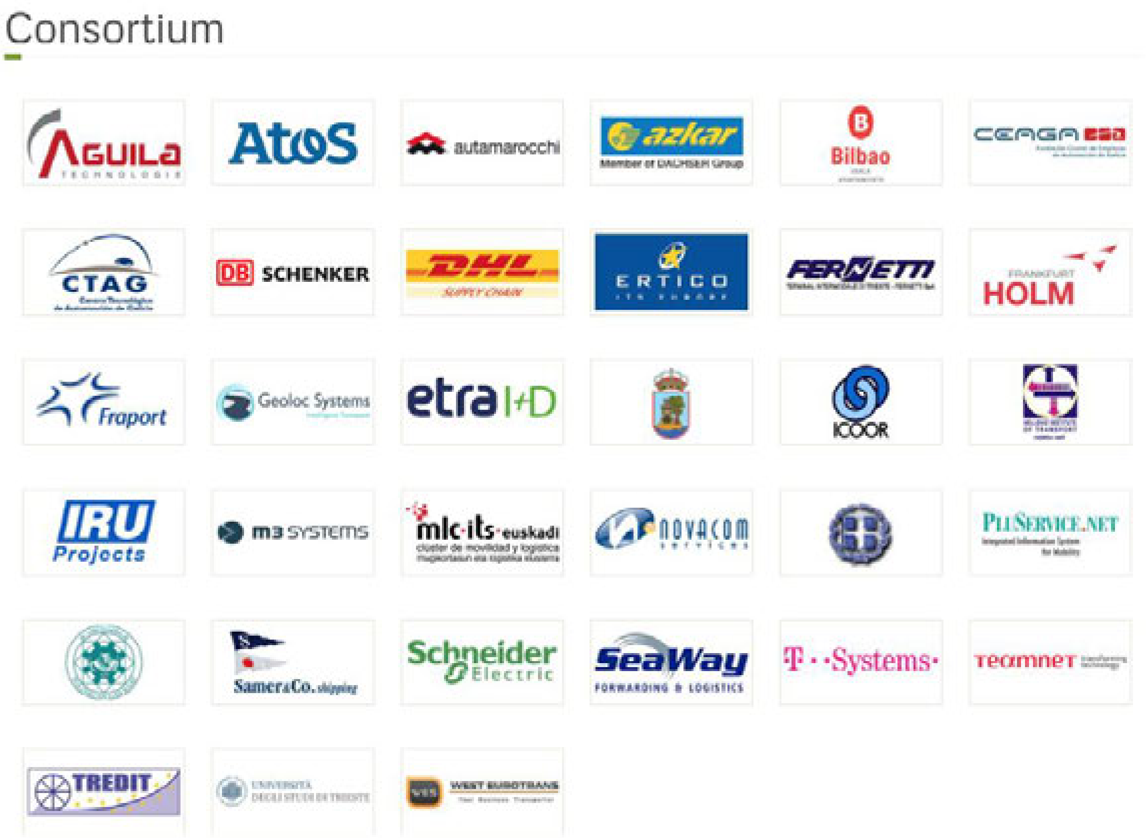
Short narrative description of your best practice including e.g. geographical dimension, numbers, target group like HGV or passengers, costs etc.	CO-GISTICS was the first European project fully dedicated to the deployment of cooperative intelligent transport systems (C-ITS) focused on logistics. CO-GISTICS services were deployed in 7 European logistics hubs; Arad (Romania), Bordeaux (France), Bilbao (Spain), Frankfurt (Germany), Thessaloniki (Greece), Trieste (Italy) and Vigo (Spain). CO-GISTICS' partners have worked together for three years on the installation and running of cooperative services on at least 315 vehicles (trucks and vans). The objectives were: ▪ Pilot and deploy C-ITS in European logistics hubs ▪ Reduce fuel consumption and the equivalent CO_2 emissions ▪ Improve logistics activities efficiency in urban areas ▪ Harmonise testing and drive interoperability forward ▪ Cooperate with logistics and freight public/private bodies During 42 months, the CO-GISTICS (Cooperative logistics for sustainable mobility of goods) project has developed and deployed five co-operative intelligent transport services applied to transport and logistics in seven European pilot sites. The seven CO-GISTICS services included: ▪ Intelligent Truck Parking and Deliver Areas Management, ▪ Cargo Transport Optimisation, ▪ CO_2 Footprint Monitoring and Estimation, ▪ Priority and Speed Advice, and ▪ Eco-drive Support. These five services have been deployed in the pilot sites Arad, Bilbao, Bordeaux, Frankfurt, Thessaloniki and Trieste. CO-GISTICS' main stakeholders are local authorities (municipalities, cities and infrastructure authorities), users (truck and van drivers, fleet operators, shippers and transports), ports and airports, and service providers. The project was co-funded by the European Union and the Competitiveness and Innovation Framework Programma (CIP). The CIP ran from 2007 till 2013. The budget was 9,996,000 euros, and funding was 4,998,000 euros.
Relation with national access point set up according to EC Delegated Regulations	☐ Provide information to the national access point ☐ Receive information from the national access point ☒ No connection to the national access point
Information provision to end users	☐ Web portal ☒ Phone app ☒ VMS ☒ In-vehicle information ☐ Other

IMPLEMENTATION ASPECTS	
Year of implementation (+ end date of measure if applicable)	January 2014 – May 2016
Technical description	The CO-GISTICS cooperative-ITS services use real-time communication between vehicles and infrastructure in order to deliver relevant and on-time information to the transport process actors. The implemented CO-GISTICS solutions target stakeholders who are interested in monitoring and reducing their carbon emissions, want to reduce their operational costs by saving time and money and have the challenge of peak delivery times causing congestion for the loading and unloading process occurring in the parking zone connecting road and harbour or airport. Moreover, CO-GISTICS solutions want to combine the optimisation of goods delivery with fleet management tasks, and to support local policy and decision makers in their objective of reducing carbon and greenhouse gas emissions related to transportation activities in the field of freight and logistics. The key users of the CO-GISTICS Intelligent Truck Parking service include fleet operators, truck drivers and intermodal terminal operators. The operations manager of the fleet operator is able to plan and pre-book the entire operation of his vehicle fleet, may it be a long-distance transport where overnight parking is needed or deliveries of goods in urban areas or at intermodal terminals. This will avoid unnecessary time loss caused by trucks waiting at these key transport nodes. By having the entire route pre-booked, the truck driver will no longer be forced to look for available delivery spaces or truck parking, avoiding stressful parts of the operation. For intermodal terminator operators, the terminal manager will be able to schedule the delivery of goods in an optimal way.

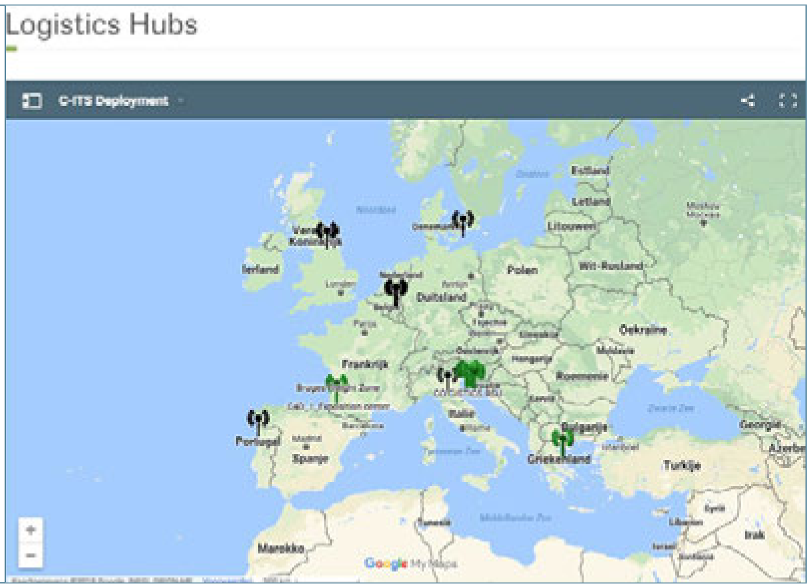
	Pilot sites which focused on intelligent truck parking are listed below: **Arad:** This CO-GISTICS pilot site focused on truck fleet operations across Europe. The main objectives of the Arad pilot were to reduce the effort and extra-distance spent by the driver to find a suitable parking place, and to reduce the emissions and speed fluctuations while still keeping the delivery deadlines. CO-GISTICS services for intelligent truck parking, CO2 emission estimation and monitoring, priority and speed advice and eco-drive support were delivered on-board (on tablets) to a fleet of heavy transport trucks (20 drivers). Partners were Teamnet (pilot site leader) and WestEuroTrans (regional partner). **Bilbao:** The main objectives of the Bilbao pilot site were to improve efficiency in the use of infrastructures by avoiding irregular parking, to improve traffic flow at the delivery areas influence, to reduce fuel consumption and CO2 emissions and to monitor the usage of the infrastructure. The Bilbao pilot site is mainly dedicated to the last-mile delivery services within urban areas. The implementation of Intelligent Truck Parking and Delivery Areas Management monitored the usage and provides information on the real status of the loading zones. Partners included MLC-ITS Euskadi (pilot side leader), Bilbao City Council, AZKAR, DHL, Etra and Telvent. **Trieste:** The main objectives of the Trieste pilot were to introduce an electronic payment system for the Fernetti dry-port increasing the percentage of electronic payments and improve synchronisation of the logistics operations in the Trieste port area (reducing queues at the Trieste port gates and waiting times for Turkish trucks in the Fernetti dry-port area). This enhanced cash flow management, lead to new parking fee policies and increased customer satisfaction. Partners included the University of Trieste (pilot site leader), Auta Marocchi S.p.A., Samer & CO. Shipping S.p.A., Intermodal Terminal Fernetti S.p.A. and Pluservice. During the pilot two cameras (truck-detectors) and 30 smartphones were used for 60 trucks and drivers. The CO-GISTICS local pilot site architecture platforms will be further exploited in two main activities: further research of CO-GISTICS products (H2020-AEOLIX) and deployment of services (Connecting Europe facility-InterCor). All CO-GISTICS services are already successfully deployed and used and the project partners and associated partners have confirmed their trust in the benefits of C-ITS services. They will contribute to further deployment of the piloted services after the end of the project and to up-scaling of the CO-GISTICS services as follows (truck parking projects): ▪ IRU will continue to integrate in TRANSPARK real-time information on the status and availability of parking slots. ▪ Bilbao City Council together with ETRA and Kapsch TrafficCom Arce Sistemas will extend the CO-GISTICS services to other areas and/or other dedicated parking slots (taxi, disabled…). ▪ Pluservice integrated the CO-GISTICS services in Infomobility, traffic management, parking and access control platform. Its services are already used by Interporto of Trieste for trucks. ▪ FERNETTI is already exploiting the electronic payment for parking.
Lessons learnt / factor of success / topics considered as good practice (technical, legal, organisational, financial)	The future of CO-GISTICS relies on the success of the services implemented in each of the seven European pilot sites and the project's reference harmonised architecture. The main strength identified in the CO-GISTICS project is the flexibility of the implementation and replicability of each service. CO-GISTICS can be replicated as autonomous components thus attracting new customers. Regarding the CO-GISTICS reference architecture, the platform has been built on the requirements and demands of the business partners participating in the project's pilot. It is anticipated that interested companies will build on this initial release to commercialise the platform. The project offers to potential investors the open specifications of the CO-GISTICS platform, as well as open source implementation of most of the platform building blocks.

Impacts assessment / results (if available)	Using the Intelligent Parking and Delivery Management Areas service bears reduction potential. The service indicates available parking space to truck drivers as well as routing. Arad pilot site could achieve an average fuel consumption in the global site area of 2.618 litres in the experimental phase compared to the significantly higher 3.848 litres in the baseline phase. By providing intelligent parking information, Trieste pilot site could achieve general traffic reduction, decreasing the congestion at the entrance of the parking area allowing more trucks to be assisted along different paths. Finally, Bilbao provided a qualitative case study examining the chances and risks of parking technologies made during the operation in the pilot site. Final project results will become available on the CO-GISTICS website soon.

ILLUSTRATIONS



CO-GISTICS consortium

CO-GISTICS logistics pilot sites	

REFERENCES	
Documentation available on the project	http://cogistics.eu/ http://cogistics.eu/wp-content/uploads/sites/2/dlm_uploads/2017/08/CoGISTICS-final-results-brochure-July2017.pdf http://cogistics.eu/wp-content/uploads/sites/2/2016/11/CO-GISTICS_D2.5-Installation-summary-for-all-pilot-sitesv1.01.pdf http://cogistics.eu/wp-content/uploads/sites/2/2016/11/CO-GISTICS-D4.1-Evaluation-framework-Final_Y2-reccomendations1.pdf (available for free download on the cogistics website)
Web link	http://cogistics.eu/

1.3.1.3 Dynamic Information on Parking Spot Availability for Lorries (SANEF)

GENERAL INFORMATION	
Name of service/system/project	Dynamic Information on Parking Spot Availability for Lorries
Name of operator/organisation	SANEF Group
Service delivery	☒ Public ☐ Private
Mainly applicable Deployment Guideline	FLS-DG01 Intelligent Truck Parking and Secure Truck Parking
Other relevant Deployment Guideline(s)	
Contact for more information	Frank Rivey, SANEF Group SANEF/SAPN, Echangeurs des Essarts, 76530 Grand Couronne, France Tel : +33 2 35 18 39 76 f.rivey@sapn.fr

GEOGRAPHICAL ASPECTS	
Country	France
Region of implementation	North of France
Corridor(s) or Network(s) concerned	Arc Atlantique

ITS SERVICE DESCRIPTION	
General Objectives	☐ Reduction of congestion ☒ Increase of safety ☐ Reduction of environmental damage ☐ Protection of the road infrastructure ☒ Increase traveller comfort ☐ Other
Specific Objectives	☐ Change the distribution in time of transport in order to achieve a more even allocation, avoiding peaks (access restrictions, fees) ☐ Change the distribution of transport in space in order to achieve a more even distribution on the network and prevent "wrong vehicles on wrong places" (traffic control, traffic management, traffic information, access restrictions) ☐ Change the composition of vehicles on a certain piece of infrastructure (access restrictions, fees) ☐ Manage the flow on a given road section in order to reduce speed variation and thus improve the capacity and reduce the risk of incidents ☐ Manage access to a given road section in order to prevent disturbances and reduce the risk of incidents (e.g. ramp metering) ☐ Increase the speed on the link and thus increase capacity (throughput) ☒ Reduce the risk of incidents and traffic disruptions through better informed infrastructure users (traffic and traveller information) ☐ Reduce the consequences from disruptions through fast countermeasures (incident response time) ☐ Reduce traffic volumes through redistributing transport between transport modes ☐ Other
Short narrative description of your best practice including e.g. geographical dimension, numbers, target group like HGV or passengers, costs etc.	Beginning in 2007, Sanef Group tested a system on highway A13 in the Normandy region to display parking space available on three successive rest areas in order to shift some lorries away from the first area they encountered and toward the following ones. This successful experiment led to plans to deploy it in other Sanef Group rest areas. South of highway A1 Lille-Paris, when approaching Paris, there is a relatively high shortage of lorry parking spaces, in both directions of traffic. Analysing parking utilisation by site also shows that the capacity of the Paris-Oise site is relatively underused despite being accessible in both directions of traffic, largely because drivers are unaware of these parking options. Sanef therefore decided to give lorry drivers better information as to the availability of spaces in those rest areas in order to optimise the parking available in general, and more specifically at the Paris-Oise site, so as to more evenly distribute lorries in the southern segment of Highway A1. The programme is therefore aimed at equipping the rest areas of the southern segment of Highway A1 approaching Paris with systems to measure and display the occupancy of lorry parking spaces. In the Paris-Lille direction, the areas from Vémars Est to Paris Oise received equipment, for a total of: ▪ 3 rest areas ▪ 3 variable-message signs In the Lille-Paris direction, the areas from Ressons Ouest to Vémars Ouest received equipment, for a total of: ▪ 6 rest areas ▪ 7 variable-message signs The two-way rest area at Paris-Oise, accessible in both directions, also received equipment. -
Relation with national access point set up according to EC Delegated Regulations	☐ Provide information to the national access point ☐ Receive information from the national access point ☐ No connection to the national access point

Information provision to end users	☐ Web portal ☐ Phone app ☒ VMS ☐ In-vehicle information ☐ Other

IMPLEMENTATION ASPECTS	
Year of implementation (+ end date of measure if applicable)	▪ Launched in 2014 ▪ Operational in 2016
Technical description	It includes a system for counting the occupancy of lorry parking spaces in the rest areas in question. The counts are created by individually measuring the occupancy of each space using the availability sensor (see figure 1). The sensors are installed in the pavement on the parking spaces. They do not need electrical connections. The sensors measure the variation in the magnetic field when a lorry arrives, thereby making it possible to count the corresponding space as being occupied. The reading is then transmitted to a hub at the rest area via a radio link. The real-time occupancy rate is then calculated by finding the ratio of readings to total parking spaces in that rest area. A data centralisation system exists to gather all parking space occupancy readings in a single database. It also makes it possible to determine whether the area is «Free» or «Full». It is made up of the following components: ▪ A hub at the rest area, which collects all of the sensor readings. ▪ A central server, and its database, which collects all readings from the rest areas. ▪ A Human Machine Interface (HMI) for technical and operational monitoring of the areas' occupancy. This HMI: ▪ gives operators of the Senlis central management station a real-time view of how occupied the parking spaces are, and what information is being displayed on the variable-message signs. ▪ gives maintenance crews a way to monitor the sensors and data hubs from a technical standpoint, allowing technical alarms to report when a component of the measurement system has a fault. A system for releasing information about parking availability. Variable-message signs are used as the primary means of informing lorry drivers. The sign, as dictated by the French Interministerial Instruction on Road Signage, is made up of a static information component (pictograms showing lorries and parking, distance to upcoming rest areas) and a dynamic information component (Free, Full, Closed) for each area.
Lessons learnt / factor of success / topics considered as good practice (technical, legal, organisational, financial)	A quantitative and qualitative assessment is conducted along the years 2016/2017/2018 with the following goals: — assessing the effectiveness of the system — studying how the system is perceived by lorry drivers — studying the quantitative changes to evaluate how the spaces are occupied in the rest areas through ex post comparison The experiments conducted on highway networks under private management, with respect to reporting the occupancy of lorry parking spaces, made it possible to quickly meet the guidelines set by public policy, particularly the needs expressed by the European Commission, notably those provided in the ITS directive regarding "provision of information services for parking places for trucks". These experiments have highlighted the effectiveness of the concession model for experimenting with and financing systems that require major investment. That information was put in place first on networks with heavy lorry traffic, particularly when approaching large urban areas, in order to meet the parking needs of lorry drivers.
Impacts assessment / results (if available)	

ILLUSTRATIONS

Figure 1: sensor installed in the pavement

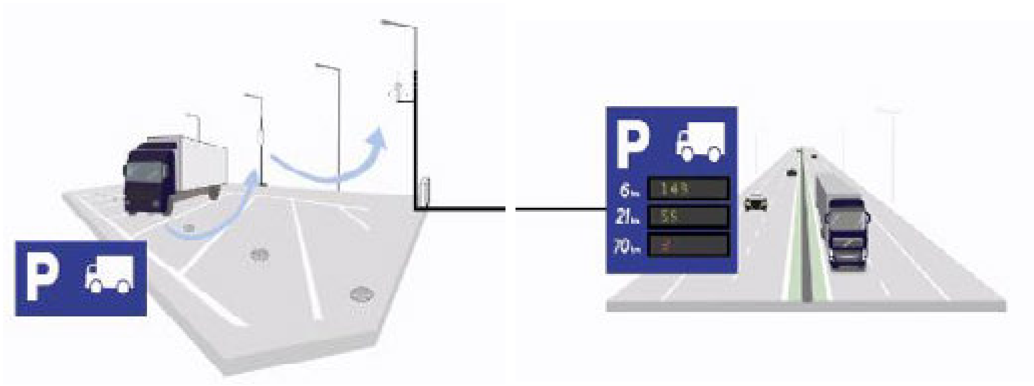


Figure 2: collection solution

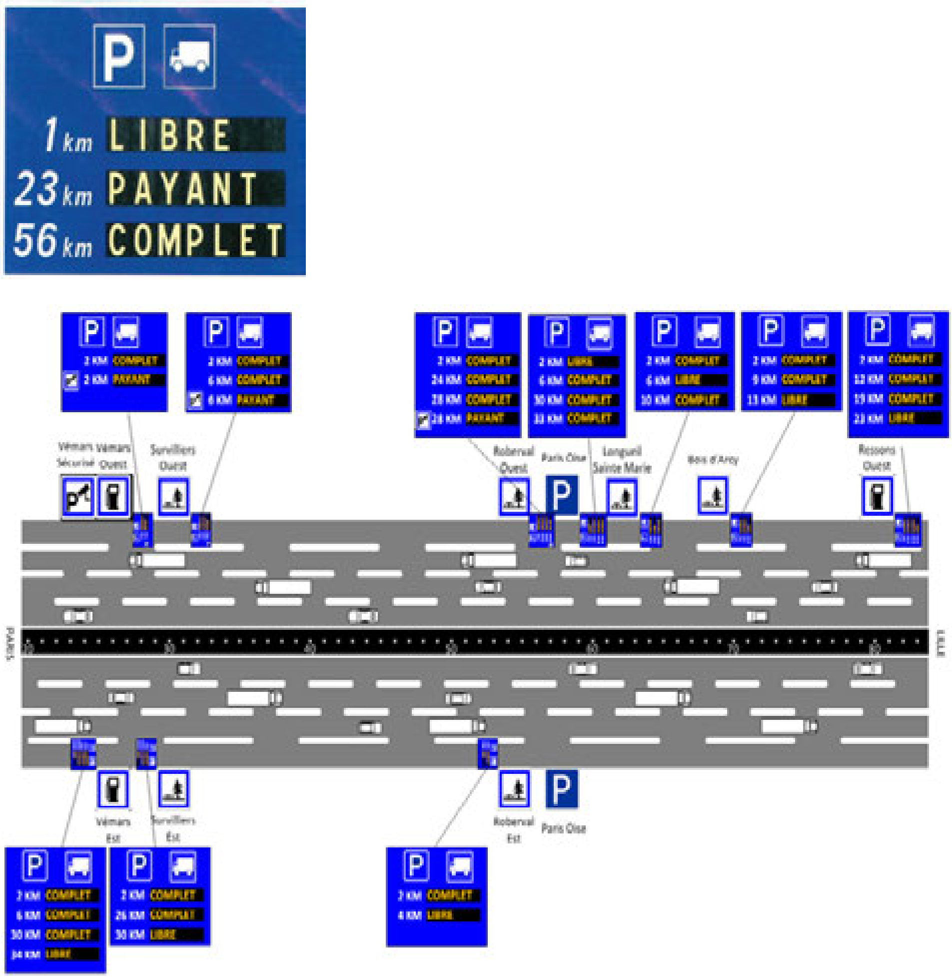


Figure 3: Lorry parking sign, announcing how full the next three areas are.

REFERENCES	
Documentation available on the project	
Web link	

1.3.1.4 Dynamic Information on Parking Spot Availability for Lorries (VINCI)

GENERAL INFORMATION	
Name of service/system/project	Dynamic Information on Parking Spot Availability for Lorries
Name of operator/organisation	VINCI Autoroutes
Service delivery	☒ Public ☐ Private
Mainly applicable Deployment Guideline	FLS-DG01 Intelligent Truck Parking and Secure Truck Parking
Other relevant Deployment Guideline(s)	
Contact for more information	Bruno ROUX, Vinci Autoroutes

GEOGRAPHICAL ASPECTS	
Country	France
Region of implementation	South of France
Corridor(s) or Network(s) concerned	MedTIS and Arc Atlantique

ITS SERVICE DESCRIPTION	
General Objectives	☐ Reduction of congestion ☒ Increase of safety ☐ Reduction of environmental damage ☐ Protection of the road infrastructure ☒ Increase traveller comfort ☐ Other
Specific Objectives	☐ Change the distribution in time of transport in order to achieve a more even allocation, avoiding peaks (access restrictions, fees) ☐ Change the distribution of transport in space in order to achieve a more even distribution on the network and prevent "wrong vehicles on wrong places" (traffic control, traffic management, traffic information, access restrictions) ☐ Change the composition of vehicles on a certain piece of infrastructure (access restrictions, fees) ☐ Manage the flow on a given road section in order to reduce speed variation and thus improve the capacity and reduce the risk of incidents ☐ Manage access to a given road section in order to prevent disturbances and reduce the risk of incidents (e.g. ramp metering) ☐ Increase the speed on the link and thus increase capacity (throughput) ☒ Reduce the risk of incidents and traffic disruptions through better informed infrastructure users (traffic and traveller information) ☐ Reduce the consequences from disruptions through fast countermeasures (incident response time) ☐ Reduce traffic volumes through redistributing transport between transport modes ☐ Other

Short narrative description of your best practice including e.g. geographical dimension, numbers, target group like HGV or passengers, costs etc.	The availability of parking spaces for lorry drivers has become critical information, which must be widely available and as accurate as possible. As part of multi-year investment programmes contracted with the French government, VINCI Autoroutes has developed an experimental solution used on the ASF, Cofiroute and Escota networks permitting to handle this particular information issue by providing information on the occupancy of nearly 80 of its biggest lorry parking lots in highway rest areas, largely on North-South routes with important lorry traffic (see figure 1). This route-based approach was chosen because it is appropriate for planning and arranging drivers' breaks, as they are informed all along their trip about where parking spaces are available
Relation with national access point set up according to EC Delegated Regulations	☐ Provide information to the national access point ☐ Receive information from the national access point ☐ No connection to the national access point
Information provision to end users	☐ Web portal ☐ Phone app ☒ VMS ☐ In-vehicle information ☐ Other

IMPLEMENTATION ASPECTS	
Year of implementation (+ end date of measure if applicable)	▪ Launched in 2010 ▪ Operational in 2013
Technical description	**Collecting data** Since 2008, ASF, Cofiroute and Escota have been already testing different lorry presence detection technologies. Feedback from these tests was incorporated into a deployment plan and enabled engineering choices appropriate both for the deadlines set for implementation and for the suppliers'ability to hold to such a tight schedule despite the technology not being truly mature. It was also necessary to work with the mixed configurations of the sites to be addressed (see Fig. 2). The equipment installed at each parking lot has been monitored regularly with many readings taken, during a three-month observation period for each parking lot between start-up and validation, with the goal of assessing the performance of that equipment, calibrating the detection thresholds, and adapting the processing algorithms. Two types of solutions have been tested and then evaluated before being deployed, based on the configuration of each parking lot: ▪ "on-site" systems that declare the occupancy of each parking space in a given rest area ▪ inventory-based metering systems that define as a whole, for each rest area, how occupied it is, using a count taken at the entrance and exit of that area. In "on-site" systems, an individual detection rate of 90% and an overall detection rate (per site) above 95% have been required, and achieved, to ensure quality information. Inventory-based metering systems (which detect vehicles entering and leaving compact areas) are checked and recalibrated monthly to guard against errors. Experience has shown us that once correctly calibrated, these systems are self-correcting, and that barring a problem that causes the posting of information to be suspended, they do not exhibit any major inaccuracies. **Processing the data** Based on the individual data collected, and in order to issue a simple message, processing algorithms have been developed that take into account the occupancy rate, the rate of detection equipment that is operational, the site's configuration, etc., with the goal of providing only two types of information as outputs: FREE or FULL, or in some cases, PAY, or CLOSED, for a given rest area. This information is shown on dynamic display signs visible from the highway.
Lessons learnt / factor of success / topics considered as good practice (technical, legal, organisational, financial)	The service is a very good response to inform lorry drivers who have to face to a difficult situation, as regulations require them to take regular breaks, but while driving they have no idea of how full the lorry parking lots are. Once at a rest area, it is common for them not to find an available spot. Forced by the law to stop, they have no choice but to park illegally, which can sometimes put their own safety and that of others at risk. feedback has shown encouraging results, with regard both to actual ability to detect the occupancy of lorry parking lots, and to the willingness of lorry drivers to heed on the broadcasted information.

Impacts assessment / results (if available)	The operation was very successful: of 200 drivers who were surveyed, 83% saw the sign. Of that number, 95% remembered the information on the first row of the sign, i.e. the one for the next rest area. That rate drops to 75% and then 57% for the other two rows. 87% said the information they got was helpful, and 52% used it to plan their stop. The language barrier does not seem to be an issue, as 40% of the drivers surveyed were from outside France, yet understood the sign and its information. For most drivers, the biggest advantage of having such information is that they can avoid making needless stops to look for a parking space (54% of lorry drivers), followed by saving time (19%) and better managing their breaks (15%). Fewer than 3% of lorry drivers felt the sign was of no value. The experiments conducted on highway networks under private management, with respect to reporting the occupancy of lorry parking spaces, made it possible to quickly meet the guidelines set by public policy, particularly the needs expressed by the European Commission, notably those provided for in the ITS directive regarding “provision of information services for parking places for trucks”. These experiments have highlighted the effectiveness of the concession model for experimenting with and financing systems that require major investment. That information was put in place first on networks with heavy lorry traffic, particularly when approaching large urban areas, in order to meet the parking needs of lorry drivers. the evaluation will be continued in the coming years to confirm or not the relevance of the solutions used, in particular as regards the systems for measuring the occupancy of parking spaces

ILLUSTRATIONS

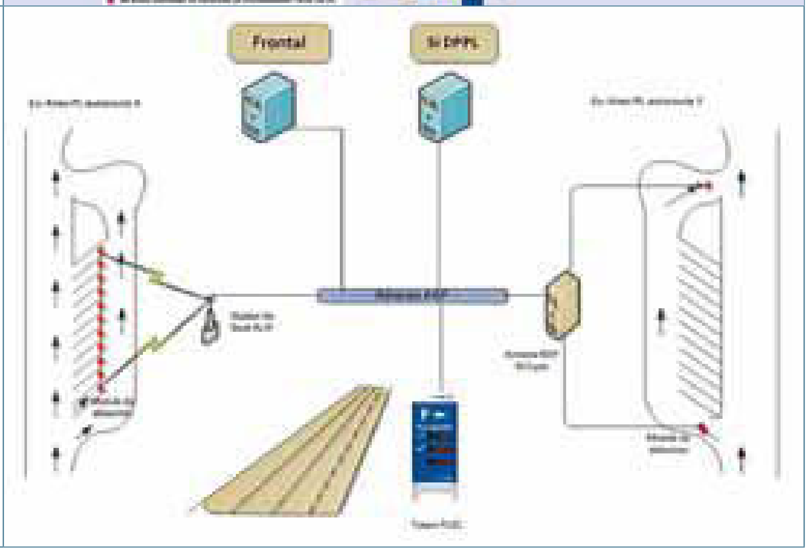
Figure 1: as example: the 40 sites chosen in the ASF Network	
Figure 2: two types of collection solution in use	

Figure 3 – Lorry parking sign, announcing parking availabilities on the next three areas are.

REFERENCES	
Documentation available on the project	
Web link	

1.3.1.5 Ennakkovarauspalvelu / queuing system

GENERAL INFORMATION	
Name of service/system/project	Ennakkovarauspalvelu / queuing system
Name of operator/organisation	Finnish Transport Agency
Service delivery	☒ Public ☐ Private
Mainly applicable Deployment Guideline	FLS-DG 01 - Intelligent Truck Parking and Secure Truck Parking
Other relevant Deployment Guideline(s)	
Contact for more information	Jyrki.jarvinen@fta.fi

GEOGRAPHICAL ASPECTS	
Country	Finland
Region of implementation	South-East
Corridor(s) or Network(s) concerned	TEN-T Scandinavian – Mediterranean Corridor

ITS SERVICE DESCRIPTION	
General Objectives	☒ Reduction of congestion ☒ Increase of safety ☒ Reduction of environmental damage ☐ Protection of the road infrastructure ☒ Increase traveller comfort ☐ Other

Specific Objectives	☒ Change the distribution in time of transport in order to achieve a more even allocation, avoiding peaks (access restrictions, fees) ☒ Change the distribution of transport in space in order to achieve a more even distribution on the network and prevent "wrong vehicles on wrong places" (traffic control, traffic management, traffic information, access restrictions) ☐ Change the composition of vehicles on a certain piece of infrastructure (access restrictions, fees) ☐ Manage the flow on a given road section in order to reduce speed variation and thus improve the capacity and reduce the risk of incidents ☐ Manage access to a given road section in order to prevent disturbances and reduce the risk of incidents (e.g. ramp metering) ☐ Increase the speed on the link and thus increase capacity (throughput) ☐ Reduce the risk of incidents and traffic disruptions through better informed infrastructure users (traffic and traveller information) ☐ Reduce the consequences from disruptions through fast countermeasures (incident response time) ☐ Reduce traffic volumes through redistributing transport between transport modes ☐ Other
Short narrative description of your best practice including e.g. geographical dimension, numbers, target group like HGV or passengers, costs etc.	Mandatory and free of charge queueing service for trucks going from Finland to Russia via Vaalimaa border crossing point.
Relation with national access point set up according to EC Delegated Regulations	☐ Provide information to the national access point ☐ Receive information from the national access point ☒ No connection to the national access point
Information provision to end users	☒ Web portal ☐ Phone app ☒ VMS ☐ In-vehicle information ☒ Other: SMS

IMPLEMENTATION ASPECTS	
Year of implementation (+ end date of measure if applicable)	2014 - 2020
Technical description	Service identifies truck when it arrives into the truck park. At pre-reserved time trucks licence plate number is shown in the screen and driver also gets SMS, which means driver has a permission to drive to Customs yard. Driver may also enter live queue, which means that he will be called to Customs if there are no pre-booked trucks to go.
Lessons learnt / factor of success / topics considered as good practice (technical, legal, organisational, financial)	Automatic identification of trucks is difficult. Operating this kind of system without human operator is also difficult. Knowing the border crossing time makes drivers and transport companies life easier and more efficient. With this kind of system we can guarantee stable flow of vehicles.
Impacts assessment / results (if available)	Order in truck park is better and there is less pollution. Drivers can better manage their rest time. Since the amount of trucks has decreased with 50% since 2008, we have not been able to test the queue reduction.

ILLUSTRATIONS	
	

REFERENCES	
Documentation available on the project	
Web link	https://www.evpa.fi/yphis/index.action?request_locale=en

1.3.1.6 ESPORG (based on LABEL project)

GENERAL INFORMATION	
Name of service/system/project	ESPORG (based on LABEL project)
Name of operator/organisation	ESPORG: European Secure Parking Organisation LABEL: The European Commission (DG Move) initiated the pilot project in 2008, along with the Operational Group (OG), including NEA (Coordination), Move & Park (Database/ICT), VEDA, Asfinag, Tank + Rast, Truck Etape (Truck Stop Areas), ADAC – EuroTest, Atlantis, DEKRA, Uni Joanneum (Certifiers)
Service delivery	☒ Public ☐ Private
Mainly applicable Deployment Guideline	FLS-DG01: Intelligent Truck Parking and Secure Truck Parking
Other relevant Deployment Guideline(s)	
Contact for more information	ESPORG: info@esporg.eu, and certifier DEKRA (Peter Paul Rushin, project manager, +49 711-7861-3578, peter.p.ruschin@dekra.com) LABEL: Rob de Leeuw van Weenen, Senior Project Manager, NEA Transport research and training (rle@nea.nl)

GEOGRAPHICAL ASPECTS	
Country	ESPORG locations: Denmark, France, Germany, Great Britain, Italy, Croatia, Latvia, Netherlands, Romania, Spain and Sweden Certified LABEL TPA's: United Kingdom, the Netherlands, Belgium, France, Spain, Italy, Austria, Germany, Slovenia, Czech Republic, Hungary, Romania, Bulgaria
Region of implementation	n.a.
Corridor(s) or Network(s) concerned	Trans-European Motorway Network

ITS SERVICE DESCRIPTION	
General Objectives	☐ Reduction of congestion ☒ Increase of safety ☐ Reduction of environmental damage ☐ Protection of the road infrastructure ☒ Increase traveller comfort ☐ Other
Specific Objectives	☐ Change the distribution in time of transport in order to achieve a more even allocation, avoiding peaks (access restrictions, fees) ☐ Change the distribution of transport in space in order to achieve a more even distribution on the network and prevent "wrong vehicles on wrong places" (traffic control, traffic management, traffic information, access restrictions) ☐ Change the composition of vehicles on a certain piece of infrastructure (access restrictions, fees) ☐ Manage the flow on a given road section in order to reduce speed variation and thus improve the capacity and reduce the risk of incidents ☐ Manage access to a given road section in order to prevent disturbances and reduce the risk of incidents (e.g. ramp metering) ☐ Increase the speed on the link and thus increase capacity (throughput) ☒ Reduce the risk of incidents and traffic disruptions through better informed infrastructure users (traffic and traveller information) ☐ Reduce the consequences from disruptions through fast countermeasures (incident response time) ☐ Reduce traffic volumes through redistributing transport between transport modes ☒ Other: Create certification system for security and comfort with broad acceptability

Short narrative description of your best practice including e.g. geographical dimension, numbers, target group like HGV or passengers, costs etc.	**ESPORG** The European Secure Parking Organisation (ESPORG) was founded in April 2010 in Belgium by the two truck stop operators Ronny Pflug (Autohof Wörnitz/Germany) and Dirk Penasse (Truckstop 26/ZoldernBelgium). ESPORG is a non-profit organisation. Currently it has over 40 members. Partners include several Gold Partners; ASSA ABLOY, CAME S.p.A., Honeywell, LOGPay, SNAP Account, Tyco Integrated Fire & Security, Johnson Controls, and other partners Concilius, DEKRA, IRU and UICR. ESPORG was set up to create a comprehensive network of secure truck stops throughout Europe. ESPORG members can check, optimise and certify their truck stops in accordance with defined security criteria in an effort to combat the rising crime levels which are affecting goods transportation routes. ESPORG is therefore also endeavouring to honour its responsibilities towards loading, logistics and transport companies. ESPORG has developed a self-assessment and certification system. Parternering together with IRU, ESPORG is using the standard LABEL; a project to develop a certification system for safe and secure truck parking areas. This standard has been updated to the current technical norms for which ESPORG relies on its partners that support ESPORG. **More information on the LABEL project:** LABEL was a project aimed at establishing and encouraging a certification system, with broad acceptability, for Truck Parking Areas (TPA) along the Trans-European Road Network. The pilot ran from 2008 till 2011 and was co-financed by the European Commission, aimed for defining, setting up, implementing and evaluating a certification process including an online information facility. The project was completed in 2011, resulting in a labelling scheme including a set of TPA standards, self-assessment tools and assessment guidelines now ready for use. The International Road Transport Union (IRA) and the International Transport Forum (ITF) were transferred the responsibility of becoming the implementing bodies of the LABEL project. Since 2011, they have pledged to jointly operate, maintain and further develop LABEL in a sustainable format through the TRANSPark web-based platform. Today the LABEL certification is used to assess security and comfort levels of truck parking areas. For more information on how LABEL is currently implemented and the current TPA's connected to TRANSPark that have been certified, view the TRANSPark website (https://www.iru.org/apps/transpark-app). The target group is transport operators, drivers, insurers, shippers and truck parking areas. TPA's in over 13 European countries have been certified with the LABEL scheme.
Relation with national access point set up according to EC Delegated Regulations	☒ Provide information to the national access point ☒ Receive information from the national access point ☐ No connection to the national access point
Information provision to end users	☒ Web portal ☒ Phone app ☐ VMS ☐ In-vehicle information ☒ Other: Certication scheme

IMPLEMENTATION ASPECTS	
Year of implementation (+ end date of measure if applicable)	ESPORG: Q3 of 2012 - present LABEL-project: 2008 – 2011. Use of LABEL: 2008 - currently
Technical description	ESPORG was created based on LABEL (and SETPOS), to further develop and professionalize these kick-off projects into a coherent full-service system. Therefore ESPORG developed the only European standard for secure truck parking areas that combines security and services and assesses them via a thorough third-party certification process. In the future the certification will also include an assessment of the connectivity. ESPORG is an association under Belgian law (ASBL). The ESPORG Board runs the daily activities and is supported by its partners and experts.

In order for new truck parking areas to be certified, they need to become an ESPORG member. The ESPORG certification is based on LABEL and audited by the certification company DEKRA SE. ESPORG turned to DEKRA for support in 2012 to meet the challenge of truck driver attacks and increasing truck stop safety. DEKRA gained experience in this field while carrying out a pilot and research project commissioned by the European Union in 2009/2010. It also helped to draft the resulting „EU Label“ criteria catalogue. ESPORG is informed of the results once an audit has been successfully completed. Depending on the security level achieved, ESPORG then issues an ESPORG certificate containing the appropriate number of padlocks.

The LABEL standard has been updated to the current technical norms, for which ESPORG relies on their partners that support them.
ESPORG is open to all operators of Truck Parks that offer a security level of at least three locks in the existing EU-Label scheme.
The aim of ESPORG is to deploy a dense network all over Europe by 2030.
The objectives of ESPORG are:
- Secure parking on international motorways for truck drivers and their consignments
- Improved security for the valuable goods supply chain
- Low-risk transport for loaders, transport companies and the manufacturers
- Deterrent effect as result of visible security measures

During ESPORG's annual conference in 2017, presentations were held by ESPORG's partners about implementing Intelligent Transport Systems; including the opportunities to implement information services, management services (supporting on-site management of TPA's), enforcement services (rules and regulations for TPA's), demand management (balance the demand for TPA's) and payment and reservation services (allowing to reserve TPA's).

More information on the LABEL pilot project:
The project LABEL stands for Creating a Label for (Secured) Truck Parking Areas along the Trans-European Road Network and Defining a Certification Process. LABEL was created by an alliance of over 40 stakeholders across Europe.

The shortlist of parking areas to be LABEL Certified as part of the first batch of certification has been established based on:
- a balanced geographical coverage of parking along the Trans-European road network
- diversity in terms of quality and security aspects offered by the parking areas.

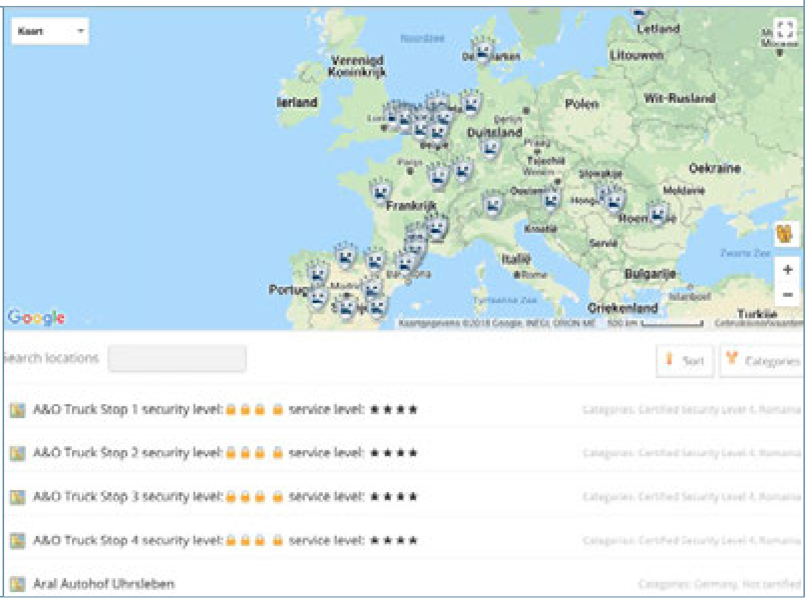
Within LABEL, ADAC and its partners have contributed to this process with the incognito tests of fifty TPAs throughout Europe under the EuroTest programme. To provide maximum quality and reliability of the data gathered, each truck parking area was tested twice by two different testers, once during the day and once at night. They tested, for example, service facilities such as sanitary installations, fuel stations or restaurants, whether fences were present around the security zones, whether pedestrians were registered upon entering or leaving, if HGV number plates were recorded along with the drivers' names upon entering a TPA or if exiting vehicles' details were matched with the data recorded upon entering. The findings of these incognito tests varied considerably, showing the need for consistent standards.

DEKRA Certification GmbH and Atlantis International Services SA are the certifiers within the LABEL project team. They will contact the truck parking areas to plan audit visits in order to determine the adequate truck parking area ratings and, in due time, issue a certificate.

The LABEL website has been taken down around May 2018. Information on LABEL and SETPOS can be found at the following presentation: https://www.unece.org/fileadmin/DAM/trans/doc/2008/sc1/ECE-TRANS-SC1-103-pres01e.pdf

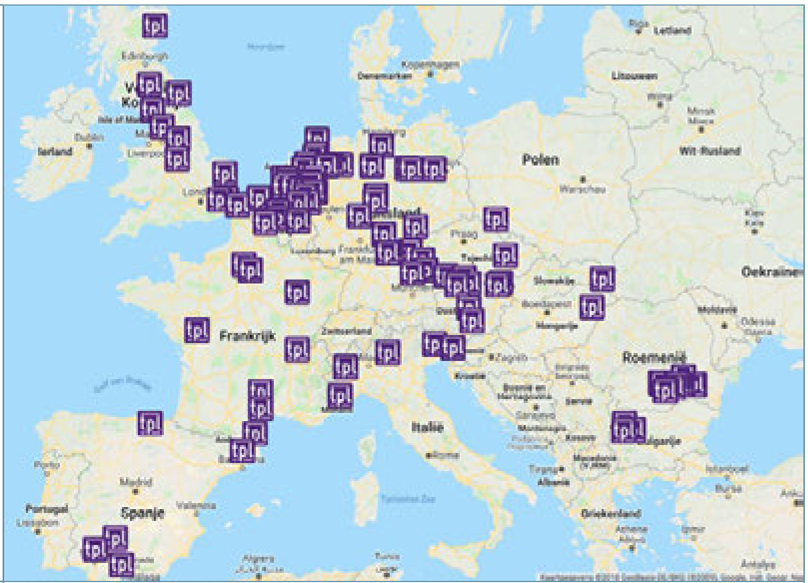
Lessons learnt / factor of success / topics considered as good practice (technical, legal, organisational, financial)	ESPORG: ▪ Companies that are considering to invest but for who the return of investment seems low, need to be motivated with a return of investment plan to build secure parking ▪ Insurance companies need to be motivated for mandating their customers to use secure parkings, especially because the motivation of truck parking area owners to pay for more security is often lacking ▪ The safety aspect of using secure parking needs to be promoted to drivers, planners, trucking companies, logistics companies and shippers LABEL: ▪ Created a European Truck Parking Areas labeling scheme for security as well as service ▪ Defined, set up, tested and evaluated a certification process ▪ Audited 71 Truck Parking Areas in 10 different EU Member States ▪ Developed tools to support managers in their decisions about potential improvement of their Truck Parking Areas ▪ Sought consensus of the industry to create a widely accepted scheme More information is needed on the factors of success and failure of the LABEL project and how these factors have impacted the implementation of security labellation on truck parking areas.
Impacts assessment / results (if available)	During the evaluation phase of the LABEL project, an Evaluation Work Package (WP6) has been established to assess the impact of LABEL from the point of view of directly involved stakeholders, such as transport operators, drivers, insurers, shippers and truck parking areas. A major output of the evaluation is the interactive business case tool. This tool will enable truck park operators to calculate approximately how much it will cost to upgrade their facilities to meet any of the LABEL levels for security and dignity. This will ultimately enable operators to forecast whether upgrade costs would be viable for their business and reduce the risk of upgrading.

ILLUSTRATIONS



ESPORG assessed TPA's

Map of Audited TPA's



Security Level 1	**Providing the Basics** Level 1 Truck Parking Areas (TPAs) offer some basic security features. A requirement is that the site is recognizable as a parking area. Driving and pedestrian areas are well-lit. Elementary security checks take place.
Security Level 2	**Technical Measures to Improve Security** Security level 2 adds to the level 1 requirement that the TPA is either surrounded by a continuous fence or that there is a CCTV system that monitors the perimeter. The parking is well-lit. Vehicles that are allowed to park are indicated by a sign. A CCTV monitors entrances/exits. Security checks take place by TPA staff or a professional organisation. CCTV images are clear and stored safely.
Security Level 3	**Security Measures are Combined, Access of Persons Restricted** Security level 3 adds to the level 2 requirement that both a fence and a CCTV system monitoring the perimeter need to be in place. The site is set up for good visibility. Constant measures are taken to keep the fence in a good condition. Only truck parking users or staff are allowed access. Criminal incidents are reported.
Security Level 4	**Real Time Monitoring of Vehicles and Persons by Professional Staff** Security level 4 adds to the level 3 requirement that on-site or remote staff monitor vehicles and pedestrians real time. Registration of vehicles and drivers takes place. Guards and staff are trained professionals, their references are checked. They are equipped to be able to react quickly to an alarm situation. Pre-booking is possible. Gates are closed.
Security Level 5	**Verification of Vehicles and Persons by Professional Staff, Site Manned Around the Clock** Security level 5 adds to level 4 that the site is manned around the clock. The identity of all vehicles or persons that enter is verified and logged. The fence is equipped with an anti-intrusion system and protected against a truck intentionally driving through. CCTV covers the entire area of the TPA.

Security Level 1	**Providing the Basics** Level 1 Truck Parking Areas (TPAs) offer some basic service features: toilets, water taps, waste bins. Walking and driving across the area should be safe.
Security Level 2	**Also Providing Washing Facilities and a More Convenient Lay-out of the Parking Area** In addition to the service criteria of Level 1, Level 2 Truck Parking Areas (TPAs) offer washing facilities and a more convenient lay-out of the parking area. Level 2 is more geared to a truck driver making a longer stop. Moreover, service Level 2 is an intermediate category between Level 1 (basic) and Level 3 (providing a much broader range of services).
Security Level 3	**Providing Service for Personal Hygiene and Shop/ Fuel Station** In addition to the service criteria of Level 2, Level 3 Truck Parking Areas (TPAs) offer more services, of which the most important: showers, a shop and a fuel station.
Security Level 4	**Providing Full Service for Driver and Vehicle** In addition to the service of Level 3, Level 4 Truck Parking Areas (TPAs) offer more services, of which the most important: a snack bar, laundry, spare parts shop and leisure facilities.
Security Level 5	**Providing the High End of Comfort Levels** In addition to the service of Level 4, Level 5 Truck Parking Areas (TPAs) offer more services, of which the most important: a restaurant, truck wash, electricity and snow/ice removal equipment. Level 5 is the highest comfort level.

REFERENCES	
Documentation available on the project	ESPORG and DEKRA services: https://www.dekra-assurance-services.com/fileadmin/user_upload/Referenzen/PDF_english/079-0115_DASS_Referenz_ESPORG_EN_151015_V1.pdf\ ESPORG presentation during their annual conference: https://www.esporg.eu/wp-content/uploads/2017/10/A_O.pdf LABEL Security and Service criteria and levels (Handbook for labelling): https://ec.europa.eu/transport/sites/transport/files/modes/road/parking/doc/handbook_for_labelling.pdf https://www.unece.org/fileadmin/DAM/trans/doc/2013/ac11/Presentation_03.pdf
Web link	https://www.esporg.eu/ https://www.iru.org/apps/transpark-app https://www.esporg.eu/what-we-do/the-voice-of-secure-parkings/ https://www.unece.org/fileadmin/DAM/trans/doc/2008/sc1/ECE-TRANS-SC1-103-pres01e.pdf

1.3.1.7 Estonian Border Queing System to Russian Federation (EU border)

GENERAL INFORMATION	
Name of service/system/project	Estonian Border Que system to Russian Federation (EU border)
Name of operator/organisation	Operator: Goswift Ltd Customer: Ministry Of Interior
Service delivery	☐ Public ☒ Private
Mainly applicable Deployment Guideline	FLS-DG 01 - Intelligent Truck Parking and Secure Truck Parking
Other relevant Deployment Guideline(s)	
Contact for more information	https://www.eestipiir.ee/yphis/index.action

GEOGRAPHICAL ASPECTS	
Country	Estonia
Region of implementation	Baltic region
Corridor(s) or Network(s) concerned	TEN-T core and comprehensive network to EU border

ITS SERVICE DESCRIPTION	
General Objectives	☒ Reduction of congestion ☒ Increase of safety ☒ Reduction of environmental damage ☒ Protection of the road infrastructure ☒ Increase traveller comfort ☐ Other

Specific Objectives	☒ Change the distribution in time of transport in order to achieve a more even allocation, avoiding peaks (access restrictions, fees) ☒ Change the distribution of transport in space in order to achieve a more even distribution on the network and prevent "wrong vehicles on wrong places" (traffic control, traffic management, traffic information, access restrictions) ☐ Change the composition of vehicles on a certain piece of infrastructure (access restrictions, fees) ☐ Manage the flow on a given road section in order to reduce speed variation and thus improve the capacity and reduce the risk of incidents ☐ Manage access to a given road section in order to prevent disturbances and reduce the risk of incidents (e.g. ramp metering) ☐ Increase the speed on the link and thus increase capacity (throughput) ☐ Reduce the risk of incidents and traffic disruptions through better informed infrastructure users (traffic and traveller information) ☐ Reduce the consequences from disruptions through fast countermeasures (incident response time) ☐ Reduce traffic volumes through redistributing transport between transport modes ☐ Other
Short narrative description of your best practice including e.g. geographical dimension, numbers, target group like HGV or passengers, costs etc.	All truck and passenger car traffic to EU border, towards Russian Federation) is managed through e-que system.
Relation with national access point set up according to EC Delegated Regulations	☐ Provide information to the national access point ☐ Receive information from the national access point ☒ No connection to the national access point
Information provision to end users	☒ Web portal ☐ Phone app ☐ VMS ☐ In-vehicle information ☒ Other: Web portal with paying solution, phone

IMPLEMENTATION ASPECTS	
Year of implementation (+ end date of measure if applicable)	On 1 August 2011, the GoSwift Queue Management Service was installed at three border crossing points from Estonia to Russia. Service is operational 24/7.
Technical description	The GoSwift border service removes long lines at borders, by queuing vehicles electronically and thereby saving money and reducing the border crossing time. **PLAN** the time when you want to cross the border **BOOK** the border crossing time on the internet, self-service terminals, on-site cash desks or by calling the GoSwift Call-centre 24/7. **GO** to the border crossing point when your car registration number is called. The organisation of entry in road border crossing points is governed by the State Borders Act. According to sections 8^2^ (1) and 8^6^ (1) of the State Borders Act, the Ministry of the Interior has transferred the organisation of entry of vehicles in the Narva, Koidula and Luhamaa road border crossing points to Goswift OÜ, OÜ Collade, Paldiski Sadamate AS and AS Transservis-N by Contract No. 7-3/620-1 and AS Sillamäe Sadam by Contract No. 2-19/9-1, under public law. http://www.goswift.eu/wp-content/uploads/2015/04/bordercrossing_-bookletA4_web.pdf
Lessons learnt / factor of success / topics considered as good practice (technical, legal, organisational, financial)	Service has fulfilled all expectations. No physical queues exists in border stations.
Impacts assessment / results (if available)	No alternatives have been presented. Predictable border crossing times Tourists and businesses can plan a journey without wasting time Drivers manage work and rest time better Border police has better info on people crossing borders, reduces risk Police reduce illegal trade at borders Local municipality has more security, less waste and pollution on roads Government has more jobs, development of rural areas and improves image of your country

ILLUSTRATIONS	
 	http://www.goswift.eu/wp-content/uploads/2015/04/bordercrossing_-bookletA4_web.pdf

REFERENCES	
Documentation available on the project	http://www.goswift.eu/services/borders/
Web link	https://www.eestipiir.ee/yphis/index.action

1.3.1.8 European Access Point for Truck Parking Data

GENERAL INFORMATION	
Name of service/system/project	European Access Point for Truck Parking Data
Name of operator/organisation	European Commission: Directorate-General for Mobility and Transport: Innovative & sustainable mobility: C3, Intelligent Transport Systems ITS
Service delivery	☒ Public ☐ Private
Mainly applicable Deployment Guideline	FLS-DG 01 - Intelligent Truck Parking and Secure Truck Parking
Other relevant Deployment Guideline(s)	DTX-DG01: DATEX II
Contact for more information	MOVE-ITS@ec.europa.eu

GEOGRAPHICAL ASPECTS	
Country	Austria, Belgium, Czech Republic, Denmark, Germany, the Netherlands, Slovenia, Sweden, Switzerland
Region of implementation	See above
Corridor(s) or Network(s) concerned	Arc Atlantique, Ursa Major, Next-ITS, Crocodile

ITS SERVICE DESCRIPTION	
General Objectives	☐ Reduction of congestion ☒ Increase of safety ☐ Reduction of environmental damage ☐ Protection of the road infrastructure ☒ Increase traveller comfort ☐ Other

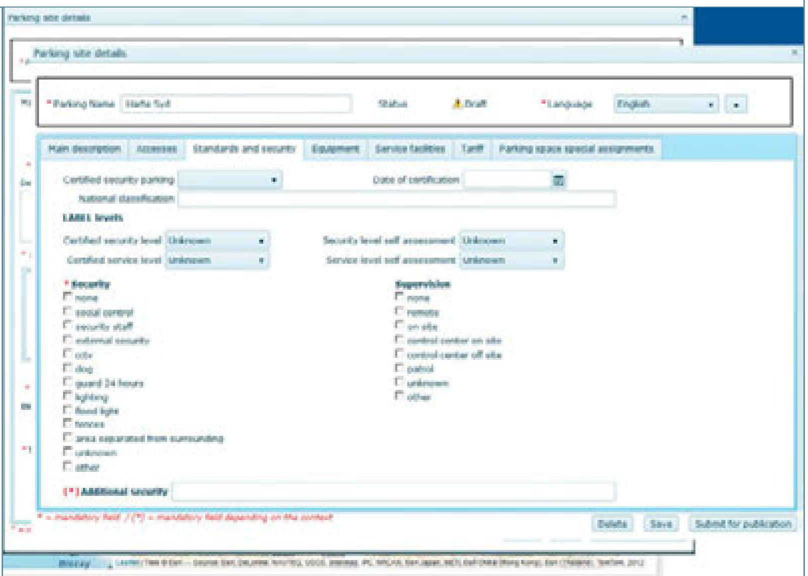
Specific Objectives	☒ Change the distribution in time of transport in order to achieve a more even allocation, avoiding peaks (access restrictions, fees) ☒ Change the distribution of transport in space in order to achieve a more even distribution on the network and prevent “wrong vehicles on wrong places” (traffic control, traffic management, traffic information, access restrictions) ☐ Change the composition of vehicles on a certain piece of infrastructure (access restrictions, fees) ☐ Manage the flow on a given road section in order to reduce speed variation and thus improve the capacity and reduce the risk of incidents ☐ Manage access to a given road section in order to prevent disturbances and reduce the risk of incidents (e.g. ramp metering) ☐ Increase the speed on the link and thus increase capacity (throughput) ☐ Reduce the risk of incidents and traffic disruptions through better informed infrastructure users (traffic and traveller information) ☐ Reduce the consequences from disruptions through fast countermeasures (incident response time) ☐ Reduce traffic volumes through redistributing transport between transport modes ☒ Other: Manage access to trans-border information on safe and secure parking locations
Short narrative description of your best practice including e.g. geographical dimension, numbers, target group like HGV or passengers, costs etc.	Public or private parking operators and service providers shall share and exchange data related to safe and secure parking areas through a national or international access point. The Commission has created a European Access Point for Truck Parking Data to enable continuity of services throughout the EU. Member States repeatedly expressed this need during the preparation and adoption phase of delegated regulation 885/2013. The European Access Point for Truck Parking aims to provide access to safe and secure truck parking data. The data includes static data related to the parking areas (related to the location, accessibility, number of free parking places and price and currency), information on safety and equipment of the parking area (description including national classification, information on special equipment), contact information of the parking operator and dynamic data on availability of parking places. All data is available in DATEX II format. The static data is accessible through a national or international access point. The responsibility for the data quality lies with the respective Member States. The use of the European Access Point is not mandatory for Member States, however should the Member States of any stakeholders choose to deploy these services in their respective field of operation, they have to comply with the provisions of the delegated Regulation (EU No 885/2013).
Relation with national access point set up according to EC Delegated Regulations	☐ Provide information to the national access point ☒ Receive information from the national access point ☐ No connection to the national access point
Information provision to end users	☒ Web portal ☐ Phone app ☐ VMS ☐ In-vehicle information ☐ Other

IMPLEMENTATION ASPECTS	
Year of implementation (+ end date of measure if applicable)	2016

Technical description	The ITS Directive (2010/40/EU) aims at accelerating the deployment of innovative ITS technologies across Europe. Based on this Directive three Delegated Regulations have been published with respect to the provision of EU-wide real-time traffic information services, road safety related traffic information services, and services for safe and secure parking places for trucks and commercial vehicles. Priority action "E" concerns the provision of information services for safe and secure parking places for trucks and commercial vehicles, requiring truck parking area owners to submit key information on truck parking areas, available on national ITS access points. On March 2016 the European Access Point for Truck Parking Data was launched by the European Commission, starting with information from Germany, Austria and the Netherlands. The status of the National Access Points of each Member State can be accessed online: (https://ec.europa.eu/transport/sites/transport/files/its-national-access-points.pdf (last update March 8, 2018). All EU Member States are required to set up National Access Points for safe and secure truck parking by 2015. Several countries have their safe and secure truck parking (SSTP) National Access Points available, without supplying this data to the European Access Point (e.g. France, Luxembourg, Poland, Spain, United Kingdom). One country does not have an SSTP National Access Point available (Czech Republic). Their truck parking static data is provided by a research company (TamTam Research s.r.o.) (source: https://data.europa.eu/euodp/en/data/dataset/etpa). The European Access Point can be accessed through the open data portal. This tool is used to store and update data in the open data portal, enables Member States to directly enter data and where initial loading of data is possible as an Excel file. The European Commission provides a DATEX II profile that corresponds to minimum requirements of delegated reulation which acts as guidance. An ECAS (European Commission's Authentication Service) account is needed to access the application. ECAS is the common authentication service that enables web applications to authenticate centrally with a common strong password. First, parking data is uploaded and stored in the ETPA-DB application after it will be made available to the public in DATEX files only. The interoperablity level is Semantic and accrual periodicity is daily. All datasets are published by the European Commission on the European Union Open Data Portal: http://open-data.europa.eu/en/data/dataset/etpa. The TENTec Portal of the European Commission is providing a visual overview of the available data: http://ec.europa.eu/transport/infrastructure/tentec/tentec-portal/map/maps.html?layer=22.

Lessons learnt / factor of success / topics considered as good practice (technical, legal, organisational, financial)	More information is needed on the reason why certain countries have yet to set up a National Access Point for truck parking data, or what other methods they use to store and share their (static or dynamic) truck parking data. The status of implementation of National Access Points in Europe has been determined with a template (through EU EIP SA 4.6). Of the 30 Member States, 20 have responded. In early 2018, nine countries have an operational NAP. Five countries (Croatia, Greece, Poland, Portugal and Romania) have concrete plans to implement an NAP. Six countries had no plans yet for implementation in 2017 (Cyprus, Czech Republic, Finland, Ireland, Norway and the UK). The UK has since started to implement a NAP for safe and secure parking. Interconnecting the NAP's and the urge for setting up a National Access Point has to be accentuated for these countries, as well as stimulating them to engage in sharing other related truck parking data. Czech Republic and Norway provide static truck parking information only to the European Access Point, without having an own NAP for truck parking (source: National Access Point, annual report 2017). During a CROCODILE 2 Technical Workshop in Budapest on November 23 2017, held in cooperation with EU EIP, ten Member States used the opportunity to present the present state of their National Access Points and thus create a common big picture on the European status quo. The discussions revealed that NAP operators indeed have to "provide access to the National Access Point". The what's-in-it-for-you is not sufficiently communicated to data and service providers with the most important factor being the possibility for free advertisement of data and services. In addition to good promotion and to battle reluctancy, NAPs shall also be comprehensive and interconnected throughout Europe. While this is clearly envisaged for the immediate future, the different setup modes of the NAPs (i.e. actual data vs. metadata) could hamper the interconnection. This could be handled through implementing a common API for accessing the NAPs, combined with consolidating the NAP features and functionalities as well as their organisational role within the complex field of European traveller information services. The workshop participants rated that taking action to change the situation of the NAPs is both urgent and important, so the next steps will focus on harmonising the interconnection of the NAPs in order to make them more attractive as well as taking an active step towards data and service providers and provide them with access to the National Access Points.
Impacts assessment / results (if available)	–

ILLUSTRATIONS



TenTec visual overview	

REFERENCES	
Documentation available on the project	Delegated Regulation on safe and secure truck parking (EU) No 885/2013: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32013R0885&from=EN Status of National Access Points: https://ec.europa.eu/transport/sites/transport/files/its-national-access-points.pdf NAP Annual Report 2017: file:///Users/ronald/Downloads/NAP%20annual%20report%202017%20(2).pdf
Web link	http://open-data.europa.eu/en/data/dataset/etpa https://ec.europa.eu/transport/themes/its/road/action_plan/intelligent-truck-parking_en

1.3.1.9 Intelligent Truck Parking in Rotterdam, the Netherlands

GENERAL INFORMATION	
Name of service/system/project	Intelligent Truck Parking in Rotterdam, the Netherlands
Name of operator/organisation	Port of Rotterdam
Service delivery	☒ Public ☒ Private
Mainly applicable Deployment Guideline	FLS-DG01 Intelligent and Secure Truck Parking
Other relevant Deployment Guideline(s)	–
Contact for more information	P. Vorenkamp (pjh.vorenkamp@portofrotterdam.com)

GEOGRAPHICAL ASPECTS	
Country	The Netherlands
Region of implementation	Provence South Holland
Corridor(s) or Network(s) concerned	Ursa Major, Arc Atlantique, East-West-corridor

ITS SERVICE DESCRIPTION	
General Objectives	☒ Reduction of congestion ☒ Increase of safety ☒ Reduction of environmental damage ☒ Protection of the road infrastructure ☒ Increase traveller comfort ☒ Other: Reduction of annoyance and cargo related crime.
Specific Objectives	☒ Change the distribution in time of transport in order to achieve a more even allocation, avoiding peaks (access restrictions, fees) ☒ Change the distribution of transport in space in order to achieve a more even distribution on the network and prevent "wrong vehicles on wrong places" (traffic control, traffic management, traffic information, access restrictions) ☐ Change the composition of vehicles on a certain piece of infrastructure (access restrictions, fees) ☐ Manage the flow on a given road section in order to reduce speed variation and thus improve the capacity and reduce the risk of incidents ☒ Manage access to a given road section in order to prevent disturbances and reduce the risk of incidents (e.g. ramp metering) ☒ Increase the speed on the link and thus increase capacity (throughput) ☐ Reduce the risk of incidents and traffic disruptions through better informed infrastructure users (traffic and traveller information) ☒ Reduce the consequences from disruptions through fast countermeasures (incident response time) ☐ Reduce traffic volumes through redistributing transport between transport modes ☒ Other: No congestion on Parking lots along the highway, due to these alternative secured parking places in the port area.
Short narrative description of your best practice including e.g. geographical dimension, numbers, target group like HGV or passengers, costs etc.	Between 2012 and 2017 the Port of Rotterdam initiated the construction of 5 well equipped parking facilities for trucks and truck drivers in the Rotterdam port area with a total capacity of 725 parking places. The purpose of this initiative was to improve safety and security for cargo, trucks, and truck drivers while at the same time reducing parking nuisance, littering and cargo related crime in the general port area.
Relation with national access point set up according to EC Delegated Regulations	☐ Provide information to the national access point ☐ Receive information from the national access point ☒ No connection to the national access point
Information provision to end users	☒ Web portal ☒ Phone app ☐ VMS ☐ In-vehicle information ☒ Other: Facebook Community

IMPLEMENTATION ASPECTS	
Year of implementation (+ end date of measure if applicable)	2012-2017 Expansion planned in 2018 and 2019
Technical description	So far 5 well equipped truck parkings have been realized with a total capacity of 725 parking places. The latest truck parking opened in May 2017 and is called "Maasvlakte Plaza". This new truck parking has a capacity of 359 parking places. Due to the high occupancy rate (more than 80%) the parking will be enlarged to 500 parking places in 2018 and 2019.
Lessons learnt / factor of success / topics considered as good practice (technical, legal, organisational, financial)	Lesson 1: After extensive market consultations the experience in Rotterdam is that truckparkings can only be developed with (mostly) public funding. In the case of Rotterdam, the port authority provided land, capex-funding and project management. A private company was contracted for maintenance and operations. Lesson 2: Truckparkings need to be well maintained and reasonably priced. Stakeholders like Unions, local government bodies and lobby groups will scrutinize a truck parking project because of its regional impact. Lessons 3: Also, a legal framework regulating truck parking in the vicinity of the truck parking needs to be introduced and enforced. Lesson 4: Transportation companies and truck drivers are willing to pay for staying at truck parkings. Lesson 5: There are many different types of trucks and parkings should facilitate this diversity. For example: Eco-combi's, Dangerous Goods, Out of Gauge transport, Reefer-trucks each requiring different facilities and dimensions.

Impacts assessment / results (if available)	1. PR-value of excellent truckparking facilities is high for ports, airports and other economic hotspots. 2. Security is improved in port area by reduction of cargo-related crime (theft, smuggling, human trafficking). 3. Reduction of empty trips within the port area. 4. Reduction of littering, vandalism and parking nuisance in port area. 5. Safe and secure incident buffer during major incidents and disruptions in the port area (strikes, fires, storm, technical problems at terminals). 6. Reduction of traffic during rush hour.

ILLUSTRATIONS	
	

1.3.1.10 Intelligent Truck Parking along the Brenner motorway (A22) – Italy

GENERAL INFORMATION	
Name of service/system/project	Intelligent Truck parking along the Brenner motorway (A22) - Italy
Name of operator/organisation	Autostrada del Brennero SpA
Service delivery	☐ Public ☒ Private
Mainly applicable Deployment Guideline	FLS-DG01
Other relevant Deployment Guideline(s)	
Contact for more information	ilaria.debiasi@autobrennero.it

GEOGRAPHICAL ASPECTS	
Country	Italy
Region of implementation	Trentino Alto Adige, Lombardy
Corridor(s) or Network(s) concerned	Brenner Corridor

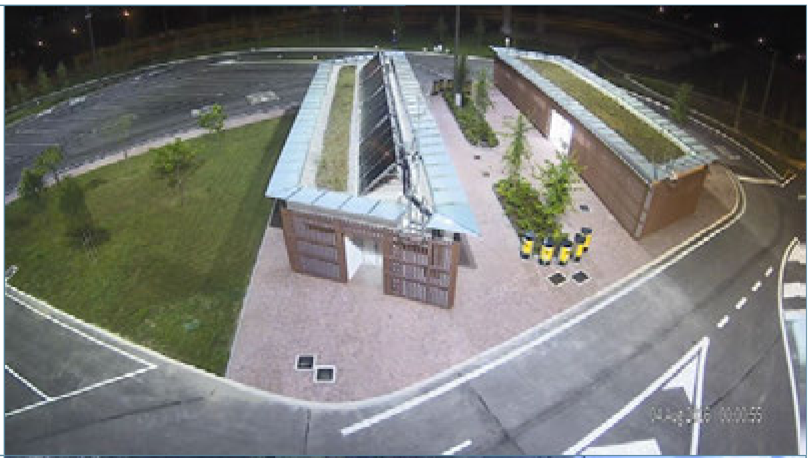
ITS SERVICE DESCRIPTION	
General Objectives	☐ Reduction of congestion ☒ Increase of safety ☐ Reduction of environmental damage ☐ Protection of the road infrastructure ☒ Increase traveller comfort ☐ Other
Specific Objectives	☐ Change the distribution in time of transport in order to achieve a more even allocation, avoiding peaks (access restrictions, fees) ☒ Change the distribution of transport in space in order to achieve a more even distribution on the network and prevent "wrong vehicles on wrong places" (traffic control, traffic management, traffic information, access restrictions) ☐ Change the composition of vehicles on a certain piece of infrastructure (access restrictions, fees) ☐ Manage the flow on a given road section in order to reduce speed variation and thus improve the capacity and reduce the risk of incidents ☐ Manage access to a given road section in order to prevent disturbances and reduce the risk of incidents (e.g. ramp metering) ☐ Increase the speed on the link and thus increase capacity (throughput) ☒ Reduce the risk of incidents and traffic disruptions through better informed infrastructure users (traffic and traveller information) ☒ Reduce the consequences from disruptions through fast countermeasures (incident response time) ☐ Reduce traffic volumes through redistributing transport between transport modes ☐ Other
Short narrative description of your best practice including e.g. geographical dimension, numbers, target group like HGV or passengers, costs etc.	Autostrada del Brennero SpA contributed to a better management of freight transport and the improvement of services for HGV drivers along the A22 by equipping 3 parking areas with a video surveillance and an access control system and a system for checking the status of the parking places (free / busy). The parking areas (dedicated to HGV drivers only) concerned are "Sadobre" (near the toll gate of Vipiteno in South Tyrol), "Rovereto South" (in Trentino) and "Campogalliano West" (in Lombardy). These parking areas have been equipped with a video surveillance system and an access control system.
Relation with national access point set up according to EC Delegated Regulations	☐ Provide information to the national access point ☐ Receive information from the national access point ☒ No connection to the national access point
Information provision to end users	☐ Web portal ☐ Phone app ☒ VMS ☐ In-vehicle information ☒ Other: fixed road signs

IMPLEMENTATION ASPECTS	
Year of implementation (+ end date of measure if applicable)	2015
Technical description	The presence of the three HGV parking lots are signalled through fixed road signs as well through VMS indicating the availability of parking spaces. The access to the parking area is regulated by a control access system and a video surveillance system grants safety in all areas.
Lessons learnt / factor of success / topics considered as good practice (technical, legal, organisational, financial)	

Impacts assessment / results (if available)	The three parking areas are always full with trucks. Drivers prefer to stop (especially during the night) in a video monitored area (even if they have to pay, like at the Sadobre area). The presence of other services like showers, availability of food, etc. are surely an added value, but safety itself (video surveillance) is sufficient for drivers to take the decision to stop in a parking lot. The fact that the availability of parking spaces is signalled along the motorway helps drivers to better plan their travel and minimizes negative impacts on safety along the motorway (due for instance to trucks stopping on emergency lay-bys or in service areas).

ILLUSTRATIONS

Access control system of ITP Sadobre	
Video surveillance system of ITP Sadobre installed at the roof of a building	

Video surveillance system of ITP Rovereto Sud	
Video surveillance system of ITP Rovereto Sud	
VMS showing the availability of parking spaces	

REFERENCES	
Documentation available on the project	
Web link	http://www.autobrennero.it

1.3.1.11 Intelligent Truck Parking system on Bavarian motorway 3 (Nuremberg and Regensburg)

GENERAL INFORMATION	
Name of service/system/project	Innovative truck parking system on Bavarian motorway A3 (Nuremberg and Regensburg)
Name of operator/organisation	Bavarian Road Administration, Zentralstelle Verkehrsmanagement (ZVM), Email: zvm@abdsb.bayern.de
Service delivery	☒ Public ☐ Private
Mainly applicable Deployment Guideline	FLS-DG01_Intelligent And Secure Truck Parking
Other relevant Deployment Guideline(s)	
Contact for more information	

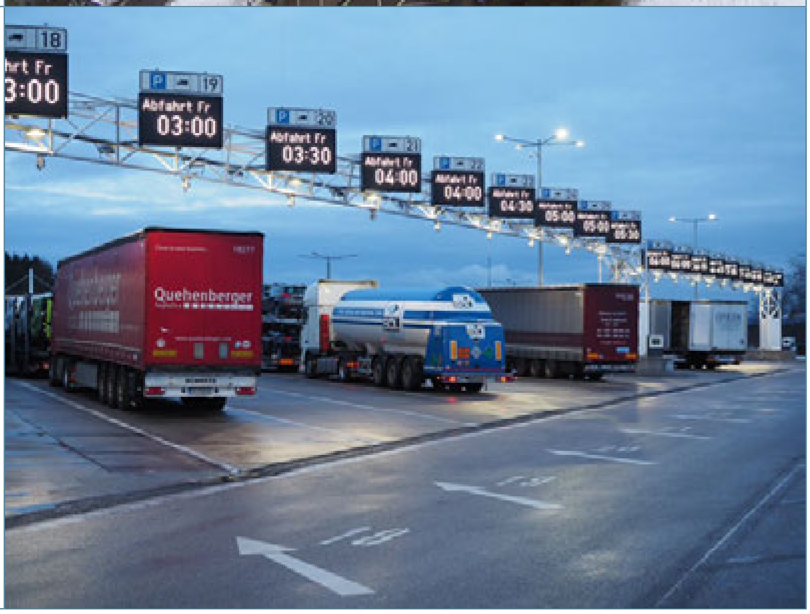
GEOGRAPHICAL ASPECTS	
Country	Germany
Region of implementation	Bavaria; rest area Jura-West on motorway A 3 between Nuremberg and Regensburg
Corridor(s) or Network(s) concerned	Ursa Major 2

ITS SERVICE DESCRIPTION	
General Objectives	☐ Reduction of congestion ☒ Increase of safety ☒ Reduction of environmental damage ☐ Protection of the road infrastructure ☐ Increase traveller comfort ☒ Other: Increase amount of truck parking spaces
Specific Objectives	☐ Change the distribution in time of transport in order to achieve a more even allocation, avoiding peaks (access restrictions, fees) ☐ Change the distribution of transport in space in order to achieve a more even distribution on the network and prevent "wrong vehicles on wrong places" (traffic control, traffic management, traffic information, access restrictions) ☐ Change the composition of vehicles on a certain piece of infrastructure (access restrictions, fees) ☐ Manage the flow on a given road section in order to reduce speed variation and thus improve the capacity and reduce the risk of incidents ☐ Manage access to a given road section in order to prevent disturbances and reduce the risk of incidents (e.g. ramp metering) ☐ Increase the speed on the link and thus increase capacity (throughput) ☒ Reduce the risk of incidents and traffic disruptions through better informed infrastructure users (traffic and traveller information) ☐ Reduce the consequences from disruptions through fast countermeasures (incident response time) ☐ Reduce traffic volumes through redistributing transport between transport modes ☐ Other

Short narrative description of your best practice including e.g. geographical dimension, numbers, target group like HGV or passengers, costs etc.	The motorway A3 between Nuremberg and Regensburg is one major motorway stretch with up to 90.000 ADT and up to 20 % HGV share. Truck parking spaces are very limited. At the rest area Jura-West the innovative truck parking system "Intelligent Controlled Truck Parking" has been put into operation the 19th of February 2016. On the existing parking area the truck parking places have been reorganised to increase the capacity. The trucks are parking in a compact way, i.e. up to 4 trucks in a row (without a driving lane between trucks as it was before) and the rows are arranged side by side. Altogether the pilot project consists of 35 parking rows with a length of 70 m. In case of three parked trucks per parking row the capacity can be raised e.g. up to 105 truck parking spaces (before 66). Above each parking row a dynamic display shows the continual departure time. Thus it is guaranteed that trucks within a parking row have the same or an earlier departure time. The new system will support the avoidance of dangerously parked trucks in offering enough parking spaces. The project supports ITS directive priority action e - the provision of information services for safe and secure parking places for trucks and commercial vehicles - and is in line with the specification.
Relation with national access point set up according to EC Delegated Regulations	☐ Provide information to the national access point ☐ Receive information from the national access point ☒ No connection to the national access point
Information provision to end users	☒ Web portal ☐ Phone app ☒ VMS ☐ In-vehicle information ☐ Other

IMPLEMENTATION ASPECTS	
Year of implementation (+ end date of measure if applicable)	2016
Technical description	The additional truck parking places can be realized due to the Compact Parking method which allows trucks to park right behind one another. Four steel tubular trellis girders with a span above 8 to 9 parking rows were mounted. The detection system (35 laser sensors) and the dynamic display (VMS) were mounted on the steel tubular trellis girders. Information can be provided via the VMS in different languages.The laser sensors detect the occupancy levels of each parking lane. Depending on occupancy levels and the expected demand, departure times are offered to the truck drivers arriving at the rest area. Above each parking row a VMS shows the continual departure time. Thus it is guaranteed that trucks within a parking row are sorted according to their departure time. In Jura-West the language switches between English and German every few seconds. Additional assistance and information is given to the users via info screens which show the actual occupation and departure times of parked trucks. This information is also available online (www.kompaktparken.de).
Lessons learnt / factor of success / topics considered as good practice (technical, legal, organisational, financial)	
Impacts assessment / results (if available)	Evaluation scheduled for 2017

ILLUSTRATIONS	
	
	



REFERENCES	
Documentation available on the project	Compact Parking Website
Web link	http://www.kompaktparken.de/

1.3.1.12 Intelligent Truck Parking system on Bavarian motorway 9 (between Nuremberg and Munich)

GENERAL INFORMATION	
Name of service/system/project	Intelligent Truck Parking on Bavarian motorway A9 (between Nuremberg and Munich)
Name of operator/organisation	Bavarian Road Administration, Zentralstelle Verkehrsmanagement (ZVM)
Service delivery	☒ Public ☐ Private
Mainly applicable Deployment Guideline	FLS_DG01_Intelligent and Secure Truck Parking
Other relevant Deployment Guideline(s)	-
Contact for more information	zvm@abdsb.bayern.de

GEOGRAPHICAL ASPECTS	
Country	Germany
Region of implementation	Bavaria; 21 rest areas between Nuremberg and Munich
Corridor(s) or Network(s) concerned	URSA MAJOR

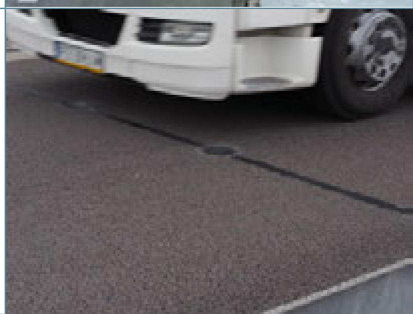
ITS SERVICE DESCRIPTION	
General Objectives	☐ Reduction of congestion ☒ Increase of safety ☒ Reduction of environmental damage ☐ Protection of the road infrastructure ☐ Increase traveller comfort ☒ Other: Reduction of parking search traffic and Reduction of overcrowding by distribution
Specific Objectives	☐ Change the distribution in time of transport in order to achieve a more even allocation, avoiding peaks (access restrictions, fees) ☒ Change the distribution of transport in space in order to achieve a more even distribution on the network and prevent “wrong vehicles on wrong places” (traffic control, traffic management, traffic information, access restrictions) ☐ Change the composition of vehicles on a certain piece of infrastructure (access restrictions, fees) ☐ Manage the flow on a given road section in order to reduce speed variation and thus improve the capacity and reduce the risk of incidents ☐ Manage access to a given road section in order to prevent disturbances and reduce the risk of incidents (e.g. ramp metering) ☐ Increase the speed on the link and thus increase capacity (throughput) ☒ Reduce the risk of incidents and traffic disruptions through better informed infrastructure users (traffic and traveller information) ☐ Reduce the consequences from disruptions through fast countermeasures (incident response time) ☐ Reduce traffic volumes through redistributing transport between transport modes ☐ Other

Short narrative description of your best practice including e.g. geographical dimension, numbers, target group like HGV or passengers, costs etc.	The motorway A9 is one of the most heavily frequented motorways in Bavaria. On the section with a length of 130 km covered by ITP system the ADT is up to 146.000, the HGV share is up to 23%. According to a study undertaken by the Federal Highway Research Institute (BASt) in 2008 a shortage between 1 to 5 spaces per km during the night time was identified for this highway section. The outcome of an additional study on the individual parking areas resulted in utilization rates of up to 260% and suggested a significant deficit of truck parking spaces. In reference to the further growth in HGV an expansion of truck parking areas on highways was started, but the construction of new or existing parking areas will entail various problems, which will delay the process, so this will not be a short-term solution for the problem. In addition, the ITP system on A9 provides better information of occupancy on parking areas aiming in reduction of search time for finding free parking spaces and of avoiding disorderly parking events outside the designated areas. The system covers 21 public parking areas at the highway in both directions and 2 private operating parking areas in the subordinated road network nearby the highway. The overall costs for local technical equipment on the parking areas for data acquisition and its installation as well as for the system which take over analysing and distributing the collected data are 6 million euro. The given information is basis for directed selection of parking areas with free parking spaces. The information is disseminated by traffic information service Bayerninfo via webpage and various apps and via DATEX II to the German data share point MDM.
Relation with national access point set up according to EC Delegated Regulations	☒ Provide information to the national access point ☐ Receive information from the national access point ☐ No connection to the national access point
Information provision to end users	☒ Web portal ☒ Phone app ☐ VMS ☐ In-vehicle information ☒ Other: Internet

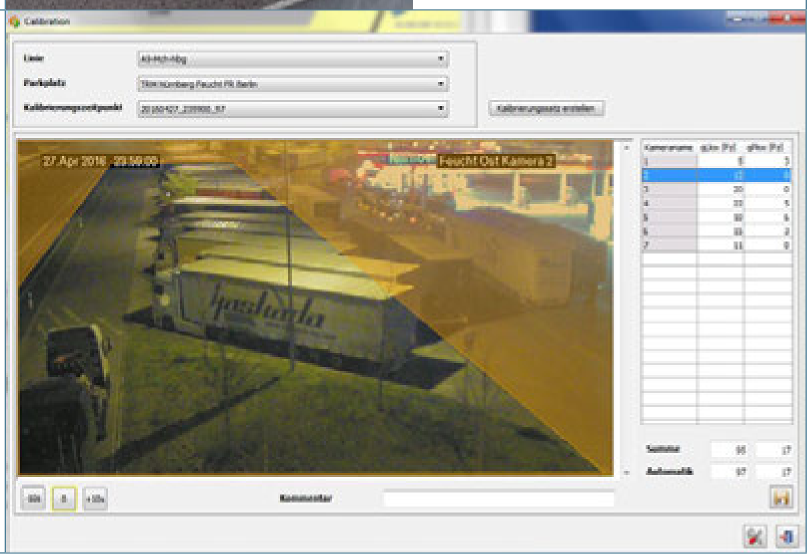
IMPLEMENTATION ASPECTS	
Year of implementation (+ end date of measure if applicable)	2013 until 2015 Some rest areas will be completed until 2018.
Technical description	With the system through balancing the data measured on entrance and exit ramps of individual parking area, the number of trucks which are currently staying on the parking area can be calculated. The system can run automatically, but has to be calibrated from time to time. For the calibration camera surveillance is being installed on each parking area. As detection technology of the occupancy rate, a combination of ground radar positioned in the road surface and laser scanner positioned at the roadway laterally. The components of ground radar (for the detection of length, direction and speed) are installed at the entrance or exit ramp of parking area, so that any passing vehicle runs over it. To detect the width and height of the vehicles an approximately 6.5 m high mast was laterally installed of the roadway. At its head a laser scanner is installed which covers the roadway area. A three-dimensional image of the vehicle is created, so that an exactly detection of the vehicles (e.g. private car or truck trailer) can be made as a result of typology of the signals in both types of detectors. The measured data set has to fulfill requirements for accuracy which were defined to guarantee a high quality and accuracy of data. The acquired data of the measurement at exit and entrance ramp is passed on to a data handling station with a truck balancing system on each parking area. There, the current occupancy is continuously determined. An overall data processing system is collecting all online data and is distributing information via various communication media to reach the truck drivers.

Lessons learnt / factor of success / topics considered as good practice (technical, legal, organisational, financial)	The first results of the examined parking areas equipped with the detection system were promising. In the first step of evaluation, the high quality requirements to accuracy in data analysis were fulfilled. And even when there was a deviation from the requirements one could find conceivable explanations. One noticeable result was that the requirements for the accuracy are only met under normal conditions completely. In special situations (e.g. parking truck in the detection area) it is not working properly. But due to the fact that a two sensor type combination is used these special settings can be handled because of the ability to work also in "single sensor mode". In future, in the second step of evaluation the search traffic for free parking spaces will be measured by also installed ANPR-System. With the ANPR-system the rest time of truck drivers will be examine.
Impacts assessment / results (if available)	Evaluation scheduled for 2018

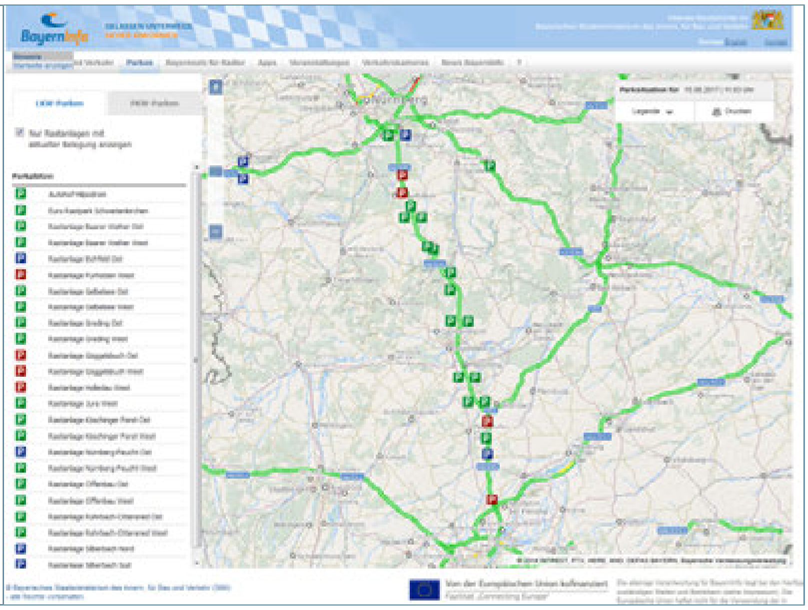
ILLUSTRATIONS



detection system consisting of laser scanner and ground radar



surveillance camera view for system calibration

Dynamic traffic information for truck parking on A 9 between Nuremberg and Munich on webpage Bayerninfo	

REFERENCES	
Documentation available on the project	Bayerninfo website
Web link	http://www.bayerninfo.de/parken

1.3.1.13 ITP system Hungary – CROCODILE project

GENERAL INFORMATION	
Name of service/system/project	ITP system Hungary – CROCODILE project
Name of operator/organisation	Magyar Közút Nzrt. – Hungarian Public Road Non-profit Plc.
Service delivery	☒ Public ☐ Private
Mainly applicable Deployment Guideline	FLS-DG01 – Intelligent Truck Parking and Secure Truck Parking
Other relevant Deployment Guideline(s)	DTX-DG01 – DATEX II
Contact for more information	Tamás Tomaschek, cef@kozut.hu

GEOGRAPHICAL ASPECTS	
Country	Hungary
Region of implementation	Western Transdanubia, Central Transdanubia
Corridor(s) or Network(s) concerned	Orient-East Med

ITS SERVICE DESCRIPTION	
General Objectives	☐ Reduction of congestion ☒ Increase of safety ☐ Reduction of environmental damage ☒ Protection of the road infrastructure ☐ Increase traveller comfort ☒ Other: Optimal use of the limited capacities

Specific Objectives	☐ Change the distribution in time of transport in order to achieve a more even allocation, avoiding peaks (access restrictions, fees) ☒ Change the distribution of transport in space in order to achieve a more even distribution on the network and prevent "wrong vehicles on wrong places" (traffic control, traffic management, traffic information, access restrictions) ☐ Change the composition of vehicles on a certain piece of infrastructure (access restrictions, fees) ☐ Manage the flow on a given road section in order to reduce speed variation and thus improve the capacity and reduce the risk of incidents ☐ Manage access to a given road section in order to prevent disturbances and reduce the risk of incidents (e.g. ramp metering) ☐ Increase the speed on the link and thus increase capacity (throughput) ☒ Reduce the risk of incidents and traffic disruptions through better informed infrastructure users (traffic and traveller information) ☐ Reduce the consequences from disruptions through fast countermeasures (incident response time) ☐ Reduce traffic volumes through redistributing transport between transport modes ☐ Other
Short narrative description of your best practice including e.g. geographical dimension, numbers, target group like HGV or passengers, costs etc.	Information on available truck parking places is a hot topic in Hungary for several years. Due to lack of parking capacities, the demand on parking lots often cannot be satisfied, especially from dusk till dawn, but even can be a problem during daytime. The share of through traffic and the amount of heavy good vehicles is high on the Hungarian TEN-T network, and especially enormous on motorway M1, which is part of the TEN-T Orient-East-Med core network corridor (Budapest-Vienna). In 2015 (after the 2nd extension of the system), rest areas with higher parking capacity were covered on M1 from the suburbs of Budapest, to the Austrian border (Hegyeshalom/Nickelsdorf), altogether 214 HGV parking places, in 10 service areas.
Relation with national access point set up according to EC Delegated Regulations	☒ Provide information to the national access point ☐ Receive information from the national access point ☐ No connection to the national access point
Information provision to end users	☐ Web portal ☒ Phone app ☒ VMS ☐ In-vehicle information ☒ Other: Datex II. XML message

IMPLEMENTATION ASPECTS	
Year of implementation (+ end date of measure if applicable)	2015
Technical description	As the first step (in 2009), a feasibility study was prepared and a pilot-project of the parking management on motorway M1 was carried out for one service area. Camera picture analysis was implemented to calculate the free parking places in real-time. The system is capable of detecting whether a truck is parking wrongly, e.g. using more places at the same time. The data coming from this calculation (the number of available places) could be shown on a semi-dynamic information sign nearby the rest area. The parking management system was integrated to the Traffic Management System, too. In 2012, within the EasyWay project Phase II, the 1st extension of the system was carried out, the parking information system in operation covered 3 parking areas (110 parking lots) after that time.

Figure 1. ITP VMS (photo by Zoltán Kapusi

Based on the lessons learnt so far, for building up a service, within CROCODILE project Phase I, 3 more service areas on the right- and 4 more on the left carriageway were integrated into the system through the 2nd extension of the system. Besides the dedicated semi-dynamic traffic signs, new functionality was also implemented, in order to place the availability information on full matrix VMSs (when no other, more important information is to be shown to road users). In this phase, the possibility of publication on internet or mobile devices, and the cross-border exchange of availability information were also solved by upgrading Datex Hub (interface and database used for data exchange). After this extension, areas with higher parking capacity were covered on M1 from the suburbs of Budapest, to the Austrian border (Hegyeshalom/Nickelsdorf).

Figure 2. Monitoring equipment at M1 Óbarok South Rest Area (photo by Zoltán Kapusi)

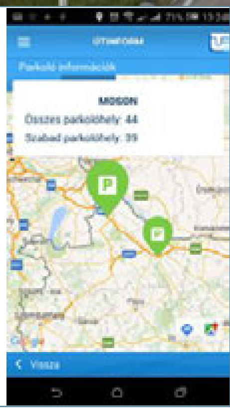


Figure3. Mobile APP

After covering the main part of motorway M1, the aim is to gather and prove availability information on the Hungarian part of the TEN-T core network, at least each 100 km (from motorways and expressways). So, on the missing eastern part of the Orient-East Med corridor (M0, M5 and M43 motorways) and on the Mediterranean corridor (M7, M0 and M3 motorways). Altogether, 13 new service areas, at 7 locations are planned to be integrated (Fig. 4. planned: marked with blue, existing: marked with red).

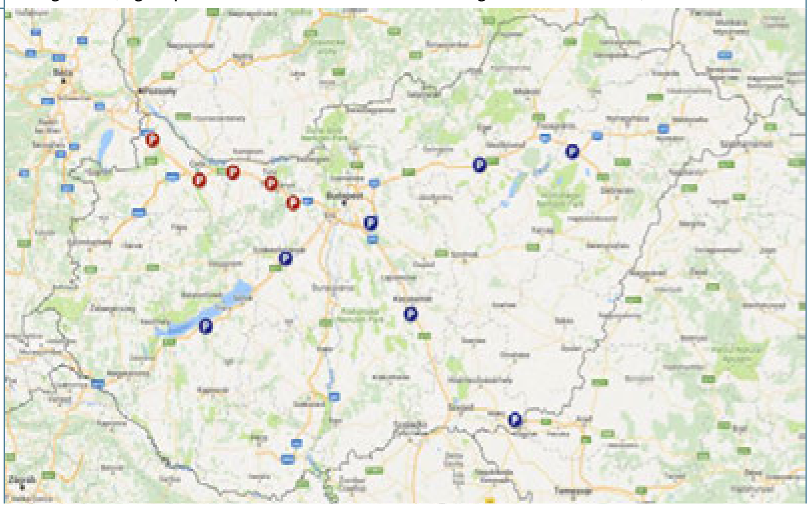


Figure 4.Planned installations in 2018 (marked in blue).

	The possibility of showing cross-border parking information is also to be considered. Though the existing system in Austria is based on showing "Full" or "Free" message, and exact available parking place numbers in Hungary, it still might be possible to exchange the result from one system to the other, via the Datex Hub. This extension and solving the data exchange is planned to be carried out within CROCODILE project phase 2, until the end of 2018, the public procurement is ongoing. One of the legal obstacles to tackle was to implement the system along concession motorway sections, too.
Lessons learnt / factor of success / topics considered as good practice (technical, legal, organisational, financial)	At the pilot implementation, way of determining the exact number of free parking lots is based on a unique 3D video analysis system, to avoid false detection (e.g. in winter weather conditions). The whole truck parking area is covered by 3 elevated double-cam surveillance points. This solution had several disadvantages: the recognition was sensitive to vibration, and changes in the relative position of the two cameras. These factors are hard to eliminate outdoor on the top of a pole, so we shifted to single cameras, with 2D recognition algorithms. This technology has a high maturity level, with an appropriate rate for a system like this. The recognition is really depending on visibility conditions. Rest areas are all equipped with lighting, but in most cases the strength of the spots was not capable for the video detection. In these service areas, we raised the performance of lighting. The possibility of showing cross-border parking information is also a main goal of this project, however it is one of the hardest issues, eg. there is an existing system in Austria, but it is based on showing "Full" or "Free" message, and not exact available parking place numbers like in Hungary. This is a bit hard to implement in our system, with the normal layout (two digit LED displays). One of the sites of the ongoing extension is operated by a concession motorway company, that was open for implementing the system, but did not want to be a project partner or implementing body, so Hungarian Public Road company (as Implementing body) is responsible for the implementation works, and the concession company – after the handover – will be responsible for the operation, according to the cooperation agreement in force.
Impacts assessment / results (if available)	N/A

	ILLUSTRATIONS
	See above (included in text).

	REFERENCES
Documentation available on the project	-
Web link	-

1.3.1.14 Secure trucks parks

	GENERAL INFORMATION
Name of service/system/project	Secure Truck parks
Name of operator/organisation	APRR, French motorway operator (member of ASFA)
Service delivery	☒ Public ☐ Private
Mainly applicable Deployment Guideline	
Other relevant Deployment Guideline(s)	
Contact for more information	Agathe MAZOYER +33 (0)6 24 53 24 29 Agathe.MAZOYER@aprr.fr

GEOGRAPHICAL ASPECTS	
Country	France
Region of implementation	A part of the motorway network
Corridor(s) or Network(s) concerned	

ITS SERVICE DESCRIPTION	
General Objectives	☒ Reduction of congestion ☒ Increase of safety ☐ Reduction of environmental damage ☐ Protection of the road infrastructure ☒ Increase traveller comfort ☐ Other
Specific Objectives	☐ Change the distribution in time of transport in order to achieve a more even allocation, avoiding peaks (access restrictions, fees) ☒ Change the distribution of transport in space in order to achieve a more even distribution on the network and prevent “wrong vehicles on wrong places” (traffic control, traffic management, traffic information, access restrictions) ☒ Change the composition of vehicles on a certain piece of infrastructure (access restrictions, fees) ☐ Manage the flow on a given road section in order to reduce speed variation and thus improve the capacity and reduce the risk of incidents ☒ Manage access to a given road section in order to prevent disturbances and reduce the risk of incidents (e.g. ramp metering) ☐ Increase the speed on the link and thus increase capacity (throughput) ☒ Reduce the risk of incidents and traffic disruptions through better informed infrastructure users (traffic and traveller information) ☐ Reduce the consequences from disruptions through fast countermeasures (incident response time) ☐ Reduce traffic volumes through redistributing transport between transport modes ☐ Other
Short narrative description of your best practice including e.g. geographical dimension, numbers, target group like HGV or passengers, costs etc.	Since 2010 APRR has opened secure car parks reserved for trucks. The first (230 places) is located at the Langres-Sud broadcaster (A31), the second near Melun (Paris Sud-Est, A5b). The capacity of the second one has been doubled due to trucks high uses (200 places). Then, APRR has planned to gradually install other trucks parks to develop this service on other parts of the network particularly frequented by trucks. These trucks parks respond to regulatory and road safety issues, rest of drivers, availability of catering, hygiene and relaxation services. Strict regulations on break times lead APRR to offer to the drivers secure parking spaces and welcoming relaxation and rest premises. It is including catering services adapted to the needs of truck drivers and accessible on foot in complete safety. These premises are supplemented by sanitary facilities within a radius of 100 m from each parking space. The number of showers will be adapted according to the number of places in the area. A laundry area equipped with washing machines and dryers is be available too. The area is covered by a high speed wifi device and there is fuel nearby.
Relation with national access point set up according to EC Delegated Regulations	☒ Provide information to the national access point ☐ Receive information from the national access point ☐ No connection to the national access point
Information provision to end users	☐ Web portal ☐ Phone app ☐ VMS ☐ In-vehicle information ☒ Other: via specific areas for truck drivers

IMPLEMENTATION ASPECTS	
Year of implementation (+ end date of measure if applicable)	From 2010 to now (end date unknown)

Technical description	In order to meet the wishes of carriers and insurers, secure car parks must meet high security standards. Thus, each car park must have at least: ▪ an enclosure closed by means of a rigid fence at least 2.50 m high, ▪ a peripheral intrusion detection system, ▪ surveillance cameras with recording function covering the entire area, ▪ a remote surveillance device and virtual patrols by camera ▪ pedestrian access by access control device, ▪ access to and exit from the truck parking lot controlled by an airlock device equipped with barriers reinforced, The exits are equipped with toll terminals coupled to an electronic toll badge reader.
Lessons learnt / factor of success / topics considered as good practice (technical, legal, organisational, financial)	Secure trucks parks are offering a new level of safety and comfort exclusively reserved for trucks/ heavy goods vehicles.
Impacts assessment / results (if available)	Meetings with transport federations, as well as surveys carried out with transporters and drivers have confirmed this need for development in France. The survey has also confirm that our proposal is conform to the needs of the market in terms of safety and services. It is also match with European standards since car parks will be proposed at "Gold" level according to European standard (Standard for Safe and Secure Truck Parking - Areas - technical specifications - 08/24/2018). We also expect these car parks to be certified.

ILLUSTRATIONS

REFERENCES

Documentation available on the project	
Web link	https://parkplus.fr/

1.3.1.15 TRANSPark

GENERAL INFORMATION	
Name of service/system/project	TRANSPark https://transpark.iru.org
Name of operator/organisation	
Service delivery	☒ Public ☒ Private
Mainly applicable Deployment Guideline	FLS-DG01 Intelligent and Secure Truck Parking
Other relevant Deployment Guideline(s)	
Contact for more information	General enquiries to transport@iru.org (phone: +41 22 918 27 00)

GEOGRAPHICAL ASPECTS	
Country	European countries: Albania, Austria, Belarus, Belgium, Bosnia-Herzegovina, Bulgaria, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Georgia, Germany, Greece, Hungary, Ireland, Italy, Kazakhstan, Latvia, Lithuania, Luxemburg, Macedonia (FYROM), Malta, Moldova, Montenegro, (the) Netherlands, Norway, Poland, Portugal, Romania, Russian Federation, Servia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey, Ukraine, United Kingdom. 21 other countries
Region of implementation	5455 parking locations within Europe
Corridor(s) or Network(s) concerned	all

ITS SERVICE DESCRIPTION	
General Objectives	☒ Reduction of congestion ☒ Increase of safety ☐ Reduction of environmental damage ☐ Protection of the road infrastructure ☒ Increase traveller comfort ☐ Other
Specific Objectives	☐ Change the distribution in time of transport in order to achieve a more even allocation, avoiding peaks (access restrictions, fees) ☐ Change the distribution of transport in space in order to achieve a more even distribution on the network and prevent “wrong vehicles on wrong places” (traffic control, traffic management, traffic information, access restrictions) ☐ Change the composition of vehicles on a certain piece of infrastructure (access restrictions, fees) ☐ Manage the flow on a given road section in order to reduce speed variation and thus improve the capacity and reduce the risk of incidents ☐ Manage access to a given road section in order to prevent disturbances and reduce the risk of incidents (e.g. ramp metering) ☐ Increase the speed on the link and thus increase capacity (throughput) ☒ Reduce the risk of incidents and traffic disruptions through better informed infrastructure users (traffic and traveller information) ☐ Reduce the consequences from disruptions through fast countermeasures (incident response time) ☐ Reduce traffic volumes through redistributing transport between transport modes ☒ Other: Allow truck drivers to find suitable parking places

Short narrative description of your best practice including e.g. geographical dimension, numbers, target group like HGV or passengers, costs etc.	TRANSPark is an online database interactive application by the IRU and International Transport Forum, offering drivers the ability to search, locate and contact over 5000 truck parking areas in over 40 countries and be able to plan routes between different locations. The application gives information about the fuel prices, border waiting times, flash information on traffic conditions and restrictions, security guidelines and legal advice and support. The application is directed towards truck drivers and parking owners (to register parking area information and undertake self-assessment of security and comfort levels). Of the available truck parking areas, two-third of which are GEO-identified. Additional data is supplied by drivers and parking managers and verified by national authorities and IRU national member associations to ensure data accuracy. Parking managers can add and promote their parking area, claim ownership of an already listed parking area, submit or update information, self-assess their parking area security and comfort levels and get certification for their parking area. Through the LABEL pilot, the IRU and ITF have developed a labelling scheme which depicts the security and comfort levels of facilities at a parking area. This scheme, including a set of TPA standards, self-assessment tools and assessment guidelines, is incorporated in this database. The IRU and ITF jointly operate, maintain and further develop LABEL in a sustainable format through the TRANSPark platform.
Relation with national access point set up according to EC Delegated Regulations	☐ Provide information to the national access point ☐ Receive information from the national access point ☒ No connection to the national access point
Information provision to end users	☒ Web portal ☒ Phone app ☐ VMS ☐ In-vehicle information ☐ Other; please specify

IMPLEMENTATION ASPECTS	
Year of implementation (+ end date of measure if applicable)	2009 - present

Technical description	TRANSPark database originates in the joint IRU-ITF publication "Truck Parking Areas 2009" (https://www.scribd.com/doc/121784173/Truck-parking-areas-2009). This data was collected by IRU Member Associations and verified by national transport authorities. Information for parking areas and services come from different sources, in particular but not limited to: **1.** Data extracted from the joint IRU-ITF publication "Truck Parking Areas 2009" **2.** Data provided by parking area owners **3.** Data provided by parking areas owners and validated by authorized parking area certifiers **4.** Data provided by the TRANSPark community through the mobile and web applications In September 2009 the platform was launched. TRANSpark is available on the IRU website and through a mobile app free of charge. The app, which is available in nine languages, also makes it easy for drivers and managers to communicate and stay connected throughout the entire journey, sharing invaluable information and experiences through the TRANSPark community. The site is also available in PDA format for use on smartphones. TRANSPark is designed to hold all the information a driver needs to find rest stops, detailed directions, ports, information of security standards and vital transport points. Some versions of the app are region specific, designed for the particular needs of drivers in, for example, East and Southern Africa. TRANSPark has already proven valuable, and once its GPS tracking capability is deployed, small transport operators—who often don't have their own fleet management system—will be able to use it as a cost-effective way of knowing where their fleet is at any one time. Currently, corridor performance is assessed using a range of data collection methods. Some of these include physical surveys with researchers sitting in the cabs of trucks; traditional surveys where truckers, traders and other stakeholders respond to questionnaires; surveys using GPS tracking hardware inside trucks; and data collection from customs systems on processing times. Important keywords about TRANSPark are: ▪ Type of sectors: transport industry, freight industry and passenger transport, ▪ Type of tasks: driving, transport management, transport of passengers and transport of dangerous goods ▪ Type of vehicle: HGV, busses and dangerous goods vehicles ▪ Type of issues: journey management, fatigue, preventing crime attacks, managing driver fitness and health and rest time rules. TRANSPark has included several additional services to enable truck drivers to create a safe and comfortable trip: ▪ Legal Assistance Network, giving transport operators requiring specialised legal assistance a fast and easy access to contact details of legal professionals specialising in transport law. ▪ Flash Info, providing first-hand, latest information on road traffic, strikes, blockades, and roadworks affecting commercial road transport. ▪ Information Centre, providing access to in house research papers, news coverage, technical documents and press releases. ▪ Security Guidelines ▪ Fuel Prices, showing the average price per litre at the pump in many countries ▪ Control Practices Feedback Desk, monitoring and logging control experiences to improve enforcement throughout the EU.
Lessons learnt / factor of success / topics considered as good practice (technical, legal, organisational, financial)	More information is needed on the use of the TRANSPark portal and whether the use has fluctuated over time. Since TRANSPark relies on truck park area owners to submit and update their data, more information is needed in how TRANSPark stimulates the inflow of up-to-date information as well as user feedback. Due to the ongoing project activities of the proprietary TRANSPark application, the TRANSPark team is unable to disclose further information regarding this project other than the publicly available information on transpark.iru.org.

Impacts assessment / results (if available)	**1.** TRANSPark helps drivers to save money, by enabling them to park in secure areas and avoid cargo, vehicle or personal theft, to check the fuel prices in 40 countries when planning their route and to avoid being fined for infringing the law with the IRU information centre. **2.** The TRANSPark database enables drivers to find safe and secure parking locations, preventing freight and fuel theft, incidents and attacks on drivers and cargo crime. **3.** TRANSPark enables drivers to plan routes more efficiently and control costs. **4.** The TRANSPark database will be used in the framework of a year-long study in 2018 to recommend a common certification system for security levels, as well as press the urge to set up sufficient safe and secure parking facilities across Europe.

ILLUSTRATIONS

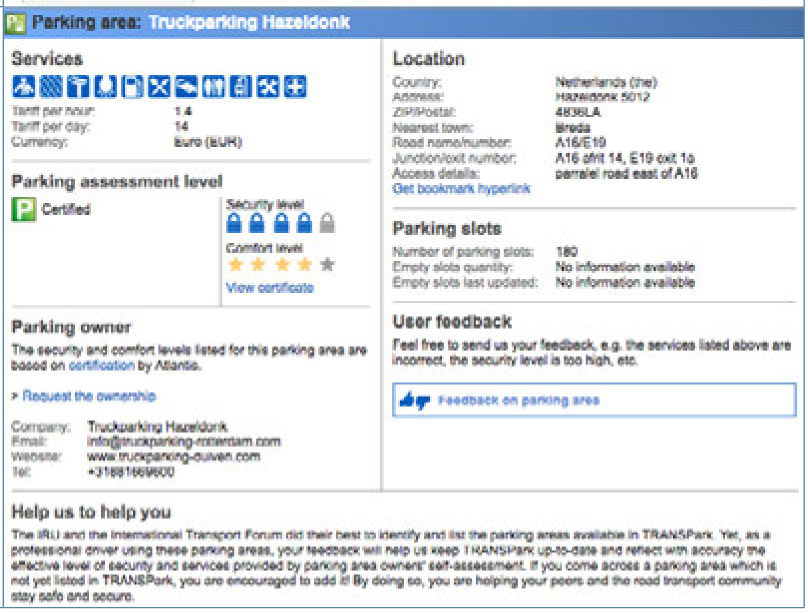
Image 1: Webpage TRANSPark, parking area search	
Image 2: Website TRANSPark, details parking area	

Image 3: App TRANSpark, search option along route

REFERENCES	
Documentation available on the project	https://www.youtube.com/watch?v=YHLsIHthNz8 http://reports.weforum.org/global-enabling-trade-report-2016/smart-statistics-for-intelligent-progress-transpark/#view/fn-1 https://www.fleet.ie/locating-secure-truck-parking-areas-in-europe/
Web link	https://www.iru.org/apps/transpark-app

1.3.1.16 Truck Parking

GENERAL INFORMATION	
Name of service/system/project	TRUCK PARKING
Name of operator/organisation	ASF (FR), ESCOTA (FR) and COFIROUTE (FR)
Service delivery	☒ Public ☐ Private
Mainly applicable Deployment Guideline	
Other relevant Deployment Guideline(s)	
Contact for more information	Laurent BESSOU ASF (French private road operator) Laurent.bessou@vince-autoroutes.com

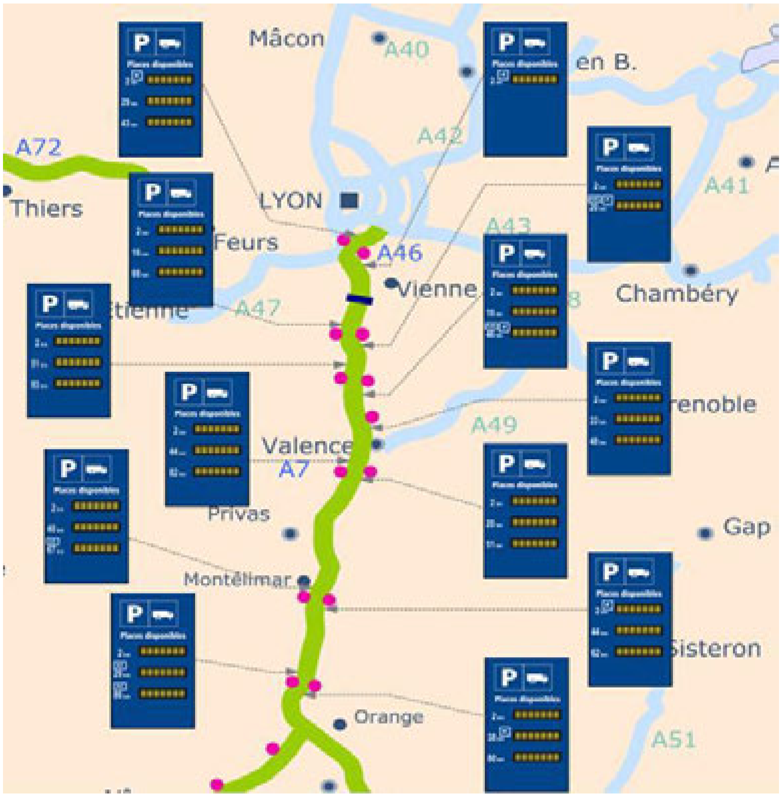
GEOGRAPHICAL ASPECTS	
Country	France
Region of implementation	France ASF ESCOTA and COFIROUTE Networks
Corridor(s) or Network(s) concerned	Arc Atlantic & MedTIS Corridor

ITS SERVICE DESCRIPTION	
General Objectives	☐ Reduction of congestion ☒ Increase of safety ☐ Reduction of environmental damage ☐ Protection of the road infrastructure ☒ Increase traveller comfort ☐ Other
Specific Objectives	☐ Change the distribution in time of transport in order to achieve a more even allocation, avoiding peaks (access restrictions, fees) ☐ Change the distribution of transport in space in order to achieve a more even distribution on the network and prevent "wrong vehicles on wrong places" (traffic control, traffic management, traffic information, access restrictions) ☐ Change the composition of vehicles on a certain piece of infrastructure (access restrictions, fees) ☐ Manage the flow on a given road section in order to reduce speed variation and thus improve the capacity and reduce the risk of incidents ☐ Manage access to a given road section in order to prevent disturbances and reduce the risk of incidents (e.g. ramp metering) ☐ Increase the speed on the link and thus increase capacity (throughput) ☐ Reduce the risk of incidents and traffic disruptions through better informed infrastructure users (traffic and traveller information) ☐ Reduce the consequences from disruptions through fast countermeasures (incident response time) ☐ Reduce traffic volumes through redistributing transport between transport modes ☒ Other: Truck parking services for comfort and safety

Short narrative description of your best practice including e.g. geographical dimension, numbers, target group like HGV or passengers, costs etc.	Thousands of truck parking lots have been built by the 3 motorway operators ASF, COFIROUTE and ESCOTA, since 2004. In order to manage and optimise the parking occupancies and therefore, avoid saturation, it has been decided to inform truck drivers with the parking availability before arriving and entering on some specific areas. In particular, among these truck parkings, VINCI AUTOROUTES offers HGV secured parking lots (440) on the following areas: ▪ South of Lyon on A46 on the service areas of Communay Nord and Communay Sud ▪ Montélimar on A7 on service area Montélimar Est ▪ North of Bayonne on A63 on service area Labenne Est ▪ Between Montpellier and Nîmes on A9 exit 27 Lunel The available services are : ▪ Secured parking with wire fences ▪ Permanent lightning ▪ Anti intrusion alarm ▪ Permanent CCTV system ▪ Toilets ▪ Free shower
Relation with national access point set up according to EC Delegated Regulations	☐ Provide information to the national access point ☐ Receive information from the national access point ☒ No connection to the national access point
Information provision to end users	☐ Web portal ☐ Phone app ☒ VMS ☐ In-vehicle information ☐ Other

IMPLEMENTATION ASPECTS	
Year of implementation (+ end date of measure if applicable)	Start date: 2010 End date:

<table>
<tr><td>Technical description</td><td>Dynamic signs provide the information for the next 3 parking areas, with a repetition of the information 3 to 5 km before each parking area. The deployment concerned our 61 largest truck parkings.


Parking VMS in France


Example A7 Motorway</td></tr>
<tr><td>Lessons learnt / factor of success / topics considered as good practice
(technical, legal, organisational, financial)</td><td>Several metering systems, principles and technologies were tested in order to measure the occupancy of the truck parking lots.
The major outcome was, at the time, the available products on the market did not provide the expected reliability rate.
Different technologies were considered and tested.</td></tr>
</table>

Impacts assessment / results (if available)	The conclusions of the different experimentations are summed up in the table below:

Principles	Description	Pros	Cons
Individual sensors	Installed under the asphalt overlay	➢ High reliability	➢ Requires high maintenance ➢ Requires demanding and complex installation
Vehicle counting	Counting vehicles entering and leaving the service area (also called the stock management). Technology such as : ➢ Electro magnetic loops ➢ Video cameras ➢ Optical or laser detection	➢ Easy to deploy. ➢ Some auto correction algorithms can be implemented to mitigate measurement errors	➢ Can not be deployed on all service areas since it requires specific area geometry

REFERENCES	
Documentation available on the project	NA
Web link	NA

1.3.1.17 Truck Parking Occupancy System (TPOS) on A61

GENERAL INFORMATION	
Name of service/system/project	Truck Parking Occupancy System (TPOS) on A61
Name of operator/organisation	Road Authority Rhineland-Palatinate, Landesbetrieb Mobilität Rheinland-Pfalz (LBM)
Service delivery	☒ Public ☐ Private
Mainly applicable Deployment Guideline	FLS_DG01_Intelligent and Secure Parking
Other relevant Deployment Guideline(s)	
Contact for more information	telematik@lbm.rlp.de

GEOGRAPHICAL ASPECTS	
Country	Germany
Region of implementation	Rhineland-Palatinate, A61, between regions of Bonn and Mannheim
Corridor(s) or Network(s) concerned	Ursa Major

ITS SERVICE DESCRIPTION	
General Objectives	☐ Reduction of congestion ☒ Increase of safety ☒ Reduction of environmental damage ☐ Protection of the road infrastructure ☐ Increase traveller comfort ☒ Other: Homogenisation of occupancy, improvement of traffic condition on the rest areas

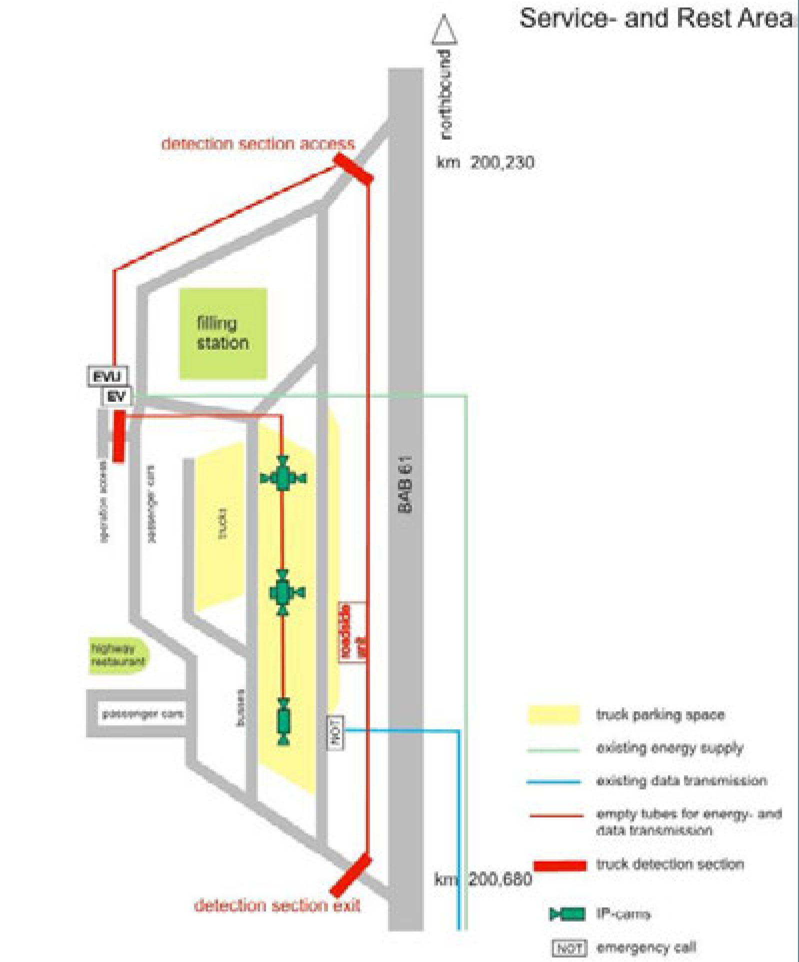
Specific Objectives	☐ Change the distribution in time of transport in order to achieve a more even allocation, avoiding peaks (access restrictions, fees) ☒ Change the distribution of transport in space in order to achieve a more even distribution on the network and prevent "wrong vehicles on wrong places" (traffic control, traffic management, traffic information, access restrictions) ☐ Change the composition of vehicles on a certain piece of infrastructure (access restrictions, fees) ☐ Manage the flow on a given road section in order to reduce speed variation and thus improve the capacity and reduce the risk of incidents ☐ Manage access to a given road section in order to prevent disturbances and reduce the risk of incidents (e.g. ramp metering) ☐ Increase the speed on the link and thus increase capacity (throughput) ☒ Reduce the risk of incidents and traffic disruptions through better informed infrastructure users (traffic and traveller information) ☐ Reduce the consequences from disruptions through fast countermeasures (incident response time) ☐ Reduce traffic volumes through redistributing transport between transport modes ☐ Other
Short narrative description of your best practice including e.g. geographical dimension, numbers, target group like HGV or passengers, costs etc.	The motorway A61 is one most important motorways in the western part of Germany in north- and southbound direction. It links the Benelux region with Switzerland and north part of Italy via Germany. The ADT is about 80,000 with an average HGV percentage of 20 % which increases up to 50% during night time. Based on the results of a BASt-study on the A61 in 2008 the deficit of missing HGV parking spaces is 1 to 5 per km which was confirmed in 2013, too. The FDot decided to implement two pilot schemes on the A9 in Bavaria and A61 in Rhineland-Palatinate in order to research the feasibility and acceptance of TPOS information for facilitation and homogenisation of truck traffic flow. It focuses especially in avoiding of exceeding the driving hours. The system covers 10 service and rest areas and 9 rest areas in north- and southbound, in total 1,190 parking spaces. The overall cost are ca. 3.6 mil. €. The information will be disseminated by the TIS Rhineland-Palatinate and the national access point MDM based on the Datex II-profile. The LBM published call for tenders for two contracts: Contract 1: infrastructure parking & rest area Contract 2: sub control centre software The functional criteria are: ▪ counting ins and outs (pre-setting by FDoT) ▪ no pre-setting for detection technology and location ▪ pre-setting of detecting area ▪ wire based connection of detection devices in terms of energy and data transmission ▪ accordant to German specification for road side units (TLS) ▪ definition of new data functional group (truck data protocol in TLS) ▪ data ownership in road authority ▪ sub control centre software within the framework of standard traffic control centre software (NERZ www.nerz-ev.de) ▪ quality criterion: ± (2 + 4% number of parking lots) by 90% sample
Relation with national access point set up according to EC Delegated Regulations	☒ Provide information to the national access point ☐ Receive information from the national access point ☐ No connection to the national access point
Information provision to end users	☒ Web portal ☐ Phone app ☐ VMS ☐ In-vehicle information ☐ Other

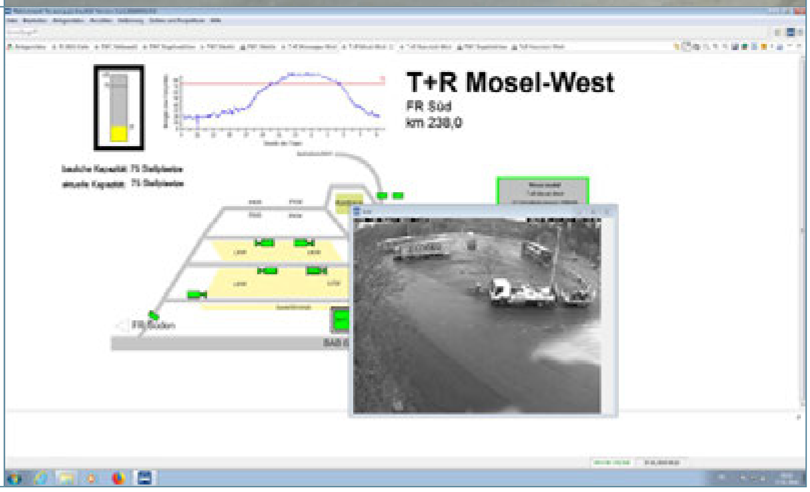
IMPLEMENTATION ASPECTS	
Year of implementation (+ end date of measure if applicable)	2016-2019

Technical description	The detection is realised by CCTV in combination with laser-scanning installed over the road surface by cantilevers. The IP cams for surveillance and calibration were installed regularly at existing poles of rest area lighting. The energy supply and data transmission is wire-based. The realisation was facilitated by using existing empty tubes. In the past, the majority of the service and rest areas were renewed or extended. In the process the empty tubes were realised at characteristics sections and locations. The subcontrol center bases on the ERZ-software (see web link). For the occupancy data, a new functional group (data protocol) was defined. The GUI is designed simply in order to support the TCC operators.
Lessons learnt / factor of success / topics considered as good practice (technical, legal, organisational, financial)	Lessons learned by realisation (actual closed testing stage), ▪ safety barriers at pole constructions with Ø > 76 mm for detection devices needed ▪ each soil investigation by pole foundation led to additional effort (warfare agent clearing) ▪ high operation costs by high energy consumption: 1.0 to 1.4 kWh at service and rest area (in comparison to VMS-gantry at controlled motorways 0.1 to 0.2 kWh) ▪ increased coordination by 2 contractors instead of one coordinating contractor
Impacts assessment / results (if available)	Not available

ILLUSTRATIONS

Functional scheme



Detection unit in the access	
GUI with occupancy time variation, IP-cam/ detection status and IP-cam image	

REFERENCES	
Documentation available on the project	
Web link	Documents for sub control center: www.nerz-ev.de Documents for road side unit: https://www.bast.de/BASt_2017/DE/Verkehrstechnik/Fachthemen/v5-tls/tls-streckenstationen.html

1.3.1.18 Truck Parking Space Detection and Information Austria

GENERAL INFORMATION	
Name of service/system/project	Truck Parking Space Detection and Information Austria
Name of operator/organisation	ASFINAG Service GmbH, Traffic Management
Service delivery	☒ Public ☐ Private
Mainly applicable Deployment Guideline	FLS-DG01 INTELLIGENT AND SECURE TRUCK PARKING
Other relevant Deployment Guideline(s)	
Contact for more information	trafficmanager@asfinag.at

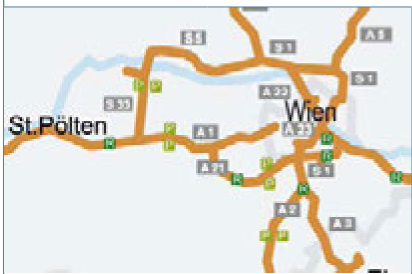
GEOGRAPHICAL ASPECTS	
Country	Austria
Region of implementation	Greater area Vienna, Greater area Linz
Corridor(s) or Network(s) concerned	Motorways in Austria

ITS SERVICE DESCRIPTION	
General Objectives	☐ Reduction of congestion ☒ Increase of safety ☐ Reduction of environmental damage ☐ Protection of the road infrastructure ☒ Increase traveller comfort ☒ Other: customer service
Specific Objectives	☐ Change the distribution in time of transport in order to achieve a more even allocation, avoiding peaks (access restrictions, fees) ☒ Change the distribution of transport in space in order to achieve a more even distribution on the network and prevent “wrong vehicles on wrong places” (traffic control, traffic management, traffic information, access restrictions) ☐ Change the composition of vehicles on a certain piece of infrastructure (access restrictions, fees) ☐ Manage the flow on a given road section in order to reduce speed variation and thus improve the capacity and reduce the risk of incidents ☐ Manage access to a given road section in order to prevent disturbances and reduce the risk of incidents (e.g. ramp metering) ☐ Increase the speed on the link and thus increase capacity (throughput) ☒ Reduce the risk of incidents and traffic disruptions through better informed infrastructure users (traffic and traveller information) ☐ Reduce the consequences from disruptions through fast countermeasures (incident response time) ☐ Reduce traffic volumes through redistributing transport between transport modes ☐ Other
Short narrative description of your best practice including e.g. geographical dimension, numbers, target group like HGV or passengers, costs etc.	Better informed infrastructure users (truck drivers) and more even distribution on the (rest area / parking place) network.
Relation with national access point set up according to EC Delegated Regulations	☐ Provide information to the national access point ☐ Receive information from the national access point ☒ No connection to the national access point
Information provision to end users	☐ Web portal ☐ Phone app ☒ VMS ☐ In-vehicle information ☐ Other

IMPLEMENTATION ASPECTS

Year of implementation (+ end date of measure if applicable)	February 2012 (Pilot Vienna) 2018: nationwide expansion to several motorways
Technical description	INTELLIGENT AND SECURE TRUCK PARKING ▪ All rest areas are equipped with CCTV ▪ operators of the Traffic Control Centres check the utilization rate regularly with CCTV ▪ Webcam-Images of the parking spaces are made available to everyone (website, mobile app) ▪ Information is displayed on the road using free-text VMS
Lessons learnt / factor of success / topics considered as good practice (technical, legal, organisational, financial)	In November 2018 an improved control system will be released. Aim of the new software and control technology is automatically supported monitoring of CCTV, faster and more user-friendly operation of the information-system and regional expansion. ▪ Expansion of VMS and CCTV in selected areas (mainly built-up areas) ▪ Software improvement ▪ Automatically supported display of CCTV ▪ experience is incorporated to new build motorway stations
Impacts assessment / results (if available)	-

ILLUSTRATIONS



Pilot area around Vienna and VMS examples

ParkingViewer 2.0: CCTV and control system

REFERENCES

Documentation available on the project	-
Web link	-

1.3.1.19 URSA MAJOR neo/App to inform truck drivers about the availability of free parking places

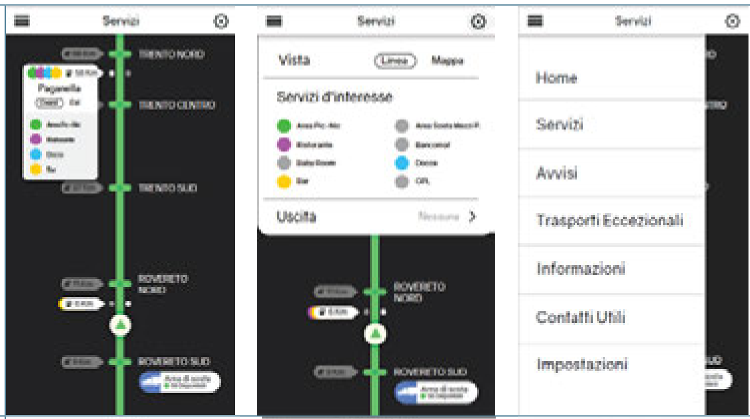
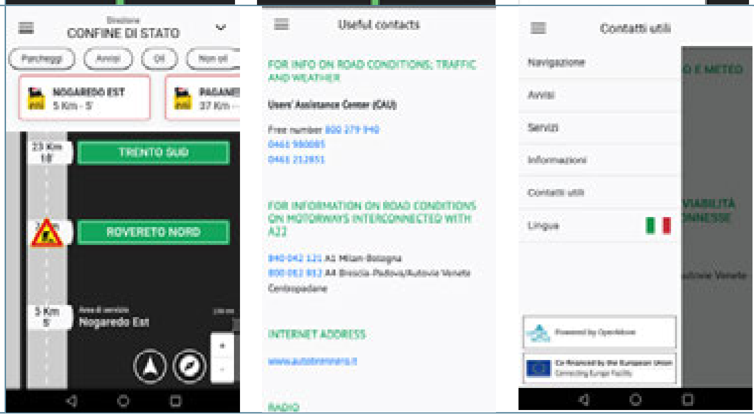
GENERAL INFORMATION	
Name of service/system/project	URSA MAJOR neo/App to inform truck drivers about the availability of free parking places
Name of operator/organisation	Autostrada del Brennero S.p.A.
Service delivery	☒ Public ☐ Private
Mainly applicable Deployment Guideline	FLS-DG01 - Intelligent and Secure Truck Parking
Other relevant Deployment Guideline(s)	TIS-DG07 - Co-Modal Traveller Information
Contact for more information	Ilaria.debiasi@autobrennero.it

GEOGRAPHICAL ASPECTS	
Country	Italy
Region of implementation	Trentino-Alto Adige, Veneto, Lombardia, Emilia-Romagna
Corridor(s) or Network(s) concerned	URSA MAJOR / ScanMed Corridor

ITS SERVICE DESCRIPTION	
General Objectives	☒ Reduction of congestion ☒ Increase of safety ☒ Reduction of environmental damage ☐ Protection of the road infrastructure ☒ Increase traveller comfort ☐ Other
Specific Objectives	☒ Change the distribution in time of transport in order to achieve a more even allocation, avoiding peaks (access restrictions, fees) ☒ Change the distribution of transport in space in order to achieve a more even distribution on the network and prevent "wrong vehicles on wrong places" (traffic control, traffic management, traffic information, access restrictions) ☐ Change the composition of vehicles on a certain piece of infrastructure (access restrictions, fees) ☐ Manage the flow on a given road section in order to reduce speed variation and thus improve the capacity and reduce the risk of incidents ☐ Manage access to a given road section in order to prevent disturbances and reduce the risk of incidents (e.g. ramp metering) ☐ Increase the speed on the link and thus increase capacity (throughput) ☒ Reduce the risk of incidents and traffic disruptions through better informed infrastructure users (traffic and traveller information) ☐ Reduce the consequences from disruptions through fast countermeasures (incident response time) ☐ Reduce traffic volumes through redistributing transport between transport modes ☐ Other
Short narrative description of your best practice including e.g. geographical dimension, numbers, target group like HGV or passengers, costs etc.	The activity concerns the management of freight transport and the improvement of services for drivers along the A22. Within the activity 2.3 of the Ursa Major neo project some parking areas were equipped with a video surveillance and an access control system and a system for checking the status of the stalls (free / busy). There is a dedicated app for displaying the number of available parking spaces, a service useful for truck drivers who need to know where parking facilities are in order to plan their journey, considering that they are regularly obliged to observe resting times. The app also provides truck drivers with further useful information for their journey, like information on possible adverse weather conditions, possible disruptions along the route or on particular services dedicated to them.

Relation with national access point set up according to EC Delegated Regulations	☐ Provide information to the national access point ☐ Receive information from the national access point ☒ No connection to the national access point
Information provision to end users	☒ Web portal ☒ Phone app ☐ VMS ☐ In-vehicle information ☐ Other

IMPLEMENTATION ASPECTS	
Year of implementation (+ end date of measure if applicable)	2018
Technical description	All the features available in the app “A22 Truck” are: ▪ “Linear view” of A22 highway with GPS position of the user ▪ automatic orientation of the “Linear view” (N>S or S>N) and automatic display of forehead POIs and events ▪ dedicated truck parking position and specific slots availability ▪ other POIs and services (fuel, food, etc.) ▪ highway entrances and exits ▪ distance to parking lots, POIs entrances and exits ▪ driving speed and ETA for every POI ▪ real-time information on “Linear view” (e.g. red path in case of traffic, snow animation in case of snow, etc.) ▪ related toast notifications and warnings (e.g. traffic, snow, accidents, construction sites, etc.) ▪ services for trucks (e.g. traffic managers, de-icing, charging stations for refrigerated trucks) ▪ information for trucks (e.g. maximum speed limit, overtaking ban, circulation prohibition of parking on lay-bys) ▪ useful contacts and resources (e.g. road conditions, mechanical rescue, accidents and emergencies, service centres) ▪ zero click interface for safe driving (e.g. orientation detection and automatic map scrolling) ▪ iOS and Android + web app (https://a22.openmove.com/) ▪ multi-language support (IT + DE + EN)
Lessons learnt / factor of success / topics considered as good practice (technical, legal, organisational, financial)	Effort on informing drivers appears always productive, both in term of traffic management aspects (safety, congestion, environment) and of customer satisfaction
Impacts assessment / results (if available)	Not yet available

ILLUSTRATIONS	
Source: Autostrada del Brennero	
Source: Autostrada del Brennero	

REFERENCES	
Documentation available on the project	Internal design
Web link	www.autobrennero.it

1.3.1.20 Ustrup øst ITP (Intelligent Truck Parking)

GENERAL INFORMATION	
Name of service/system/project	Ustrup øst ITP (Intelligent Truck Parking)
Name of operator/organisation	Danish Road Directorate
Service delivery	☒ Public ☐ Private
Mainly applicable Deployment Guideline	FLS-DG01_Intelligent and Secure Truck Parking
Other relevant Deployment Guideline(s)	-
Contact for more information	

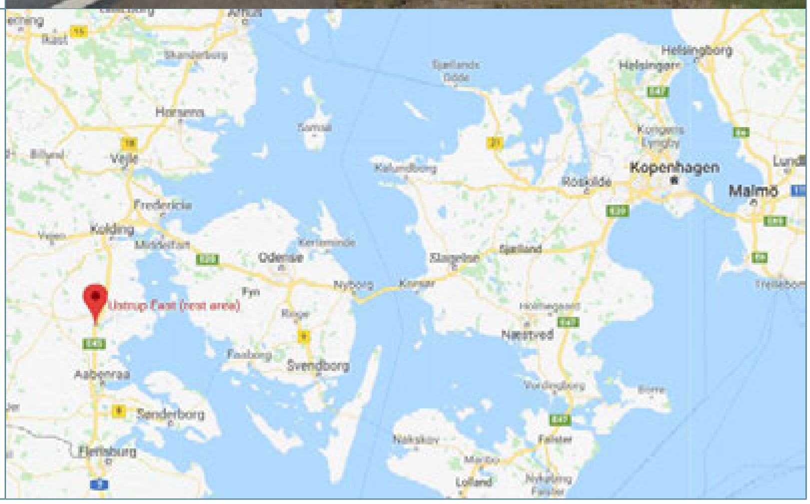
GEOGRAPHICAL ASPECTS	
Country	Denmark
Region of implementation	Region South Denmark
Corridor(s) or Network(s) concerned	Scandinavian-Mediterranean

ITS SERVICE DESCRIPTION	
General Objectives	☐ Reduction of congestion ☐ Increase of safety ☐ Reduction of environmental damage ☐ Protection of the road infrastructure ☐ Increase traveller comfort ☒ Other: Increase Amount of truck parking spaces
Specific Objectives	☐ Change the distribution in time of transport in order to achieve a more even allocation, avoiding peaks (access restrictions, fees) ☒ Change the distribution of transport in space in order to achieve a more even distribution on the network and prevent "wrong vehicles on wrong places" (traffic control, traffic management, traffic information, access restrictions) ☐ Change the composition of vehicles on a certain piece of infrastructure (access restrictions, fees) ☐ Manage the flow on a given road section in order to reduce speed variation and thus improve the capacity and reduce the risk of incidents ☐ Manage access to a given road section in order to prevent disturbances and reduce the risk of incidents (e.g. ramp metering) ☐ Increase the speed on the link and thus increase capacity (throughput) ☐ Reduce the risk of incidents and traffic disruptions through better informed infrastructure users (traffic and traveller information) ☐ Reduce the consequences from disruptions through fast countermeasures (incident response time) ☐ Reduce traffic volumes through redistributing transport between transport modes ☐ Other
Short narrative description of your best practice including e.g. geographical dimension, numbers, target group like HGV or passengers, costs etc.	On the ITP facility at Ustrup East parking is managed by a fully automatic and unmanned system. The system directs and allocates the trucks to parking lanes, depending on the driver's entries. From the beginning it was an imperative precondition that the system should be fully automatic. Today ordinary truck stops functions without any guidance from ground personnel. The basic concept behind the design is that the system 'packs' vehicles into columns, depending on their departure times. This means that vehicles that are set to leave the rest area immediately after one another are also placed after one another in the same column. In this way the columns are freed up within a short time span and there will once again be room for new vehicles on site. There are 9 columns with space for approximately 5 trucks in each column (approx. 45 trucks in total). With the previous layout of the parking facility there was only space for 19 trucks on approx. the same space. The system consists of various components that all serve to ensure that the users have a good experience with the system. At the same time, the system is designed to have the best possible conditions for packing vehicles appropriately with a minimum of potential sources of error.
Relation with national access point set up according to EC Delegated Regulations	☒ Provide information to the national access point ☐ Receive information from the national access point ☐ No connection to the national access point
Information provision to end users	☐ Web portal ☐ Phone app ☒ VMS ☐ In-vehicle information ☐ Other

IMPLEMENTATION ASPECTS

Year of implementation (+ end date of measure if applicable)	2012
Technical description	Generally seen, the system consists of an arrival area with a terminal and a gate barrier, as well as a parking area divided into columns. In addition, there are a number of service features, such as lane lights that show drivers the way to their assigned column, and VMS along the highway that show the number of available parking spaces at Ustrup East. Upon arrival at the arrival area, drivers enter their desired hours of rest into the system, and lane lights in the pavement show them the way to their designated lane. When the vehicle has parked in the correct lane, the lane detection scanners rescan all the lanes to measure and calculate the remaining capacity and to ensure that the driver has parked in the correct lane. Should a driver park his vehicle in a wrong lane, the system automatically closes the given lane, until the stray vehicle has left the area. A sensitive lane detection system is used with industrial lasers to continuously measure the remaining capacity of the individual lanes. The precise measurements help to create a robust system with optimal conditions for packing the trucks in columns. In total the ITP consists of the following subsystems: — Terminal for registration with 2 displays (high and low) — Gate barrier with loop detector for detection of vehicles — Terminal server — Video server — UPS (emergency power supply) — Firewall — Lane lights for truck guidance — 3 PTZ cameras and 1 stationary camera — 9 laser detectors (one detector for each lane) — VMS on the Highway.
Lessons learnt / factor of success / topics considered as good practice (technical, legal, organisational, financial)	The primary lessons learned are: — The system is free of charge. However, it is still a barrier for the truck drivers to pass the gate barrier. It is necessary to use signs with “free of charge”. — Unintended many trucks with short stop time uses parking spaces reserved for bus parking outside the ITP area. — Information and dialog with truck organisations and truck drivers are necessary for acceptance and optimal use of the system.
Impacts assessment / results (if available)	Statics from the system: — In average 1050 users each month; — Most popular during weekdays and in the evening/night; — Most used by the nationalities: Danish (26%), Polish (20%) and German (19%).

ILLUSTRATIONS

REFERENCES	
Documentation available on the project	Not public accessible
Web link	No web portal

1.3.2 F&LS-02 Access to Abnormal Goods Transport Regulation

1.3.2.1 Highways England Access to Abnormal Loads Regulation

GENERAL INFORMATION	
Name of service/system/project	Highways England Access to Abnormal Loads Regulations
Name of operator/organisation	Highways England, United Kingdom
Service delivery	☒ Public ☐ Private
Mainly applicable Deployment Guideline	FLS-DG02 Access to Abnormal Goods Transport Regulations
Other relevant Deployment Guideline(s)	Editor's note: The EXISTING Best Practice needs to be retired. The system has been updated and a new Best Practice needs to be created. More information can currently be found at www.esdal2.com
Contact for more information	ESDAL Help Desk enquiries@esdal2.com Telephone: 01642 049 830

GEOGRAPHICAL ASPECTS	
Country	United Kingdom
Region of implementation	
Corridor(s) or Network(s) concerned	TEN-T: North Sea – Mediterranean

ITS SERVICE DESCRIPTION	
General Objectives	☐ Reduction of congestion ☐ Increase of safety ☐ Reduction of environmental damage ☐ Protection of the road infrastructure ☐ Increase traveller comfort ☐ Other
Specific Objectives	☐ Change the distribution in time of transport in order to achieve a more even allocation, avoiding peaks (access restrictions, fees) ☐ Change the distribution of transport in space in order to achieve a more even distribution on the network and prevent "wrong vehicles on wrong places" (traffic control, traffic management, traffic information, access restrictions) ☐ Change the composition of vehicles on a certain piece of infrastructure (access restrictions, fees) ☒ Manage the flow on a given road section in order to reduce speed variation and thus improve the capacity and reduce the risk of incidents ☐ Manage access to a given road section in order to prevent disturbances and reduce the risk of incidents (e.g. ramp metering) ☐ Increase the speed on the link and thus increase capacity (throughput) ☐ Reduce the risk of incidents and traffic disruptions through better informed infrastructure users (traffic and traveller information) ☐ Reduce the consequences from disruptions through fast countermeasures (incident response time) ☐ Reduce traffic volumes through redistributing transport between transport modes ☐ Other
Short narrative description of your best practice including e.g. geographical dimension, numbers, target group like HGV or passengers, costs etc.	Using ESDAL you can: ▪ plan your route ▪ notify the police, highways and bridge authorities of your abnormal indivisible load (AIL) movements around the road network ▪ get advance notice of any possible route problems ▪ save vehicle details and routes for future use
Relation with national access point set up according to EC Delegated Regulations	☐ Provide information to the national access point ☐ Receive information from the national access point ☐ No connection to the national access point

Information provision to end users	☒ Web portal ☐ Phone app ☒ VMS ☐ In-vehicle information ☐ Other

IMPLEMENTATION ASPECTS	
Year of implementation (+ end date of measure if applicable)	
Technical description	
Lessons learnt / factor of success / topics considered as good practice (technical, legal, organisational, financial)	
Impacts assessment / results (if available)	

REFERENCES	
Documentation available on the project	
Web link	www.highways.gov.uk

1.3.2.2 Tenet: online application for abnormal individual transport authorization

GENERAL INFORMATION	
Name of service/system/project	Tenet: online application for abnormal individual transport authorization
Name of operator/organisation	MINISTÈRE DE LA TRANSITION ÉCOLOGIQUE ET SOLIDAIRE MINISTÈRE DE LA COHÉSION DES TERRITOIRES
Service delivery	☒ Public ☐ Private
Mainly applicable Deployment Guideline	FLS-DG02 Access to Abnormal Goods Transport Regulations
Other relevant Deployment Guideline(s)	Newly added
Contact for more information	N/A only contact form http://www.securite-routiere.gouv.fr/contact2

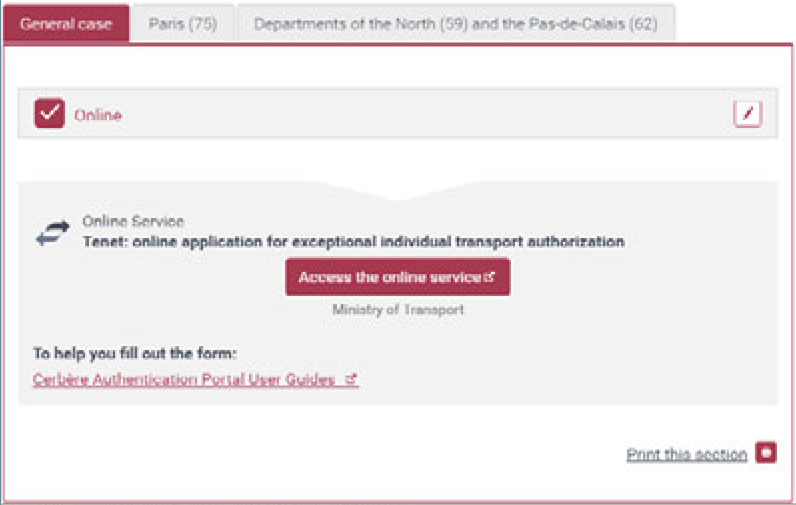
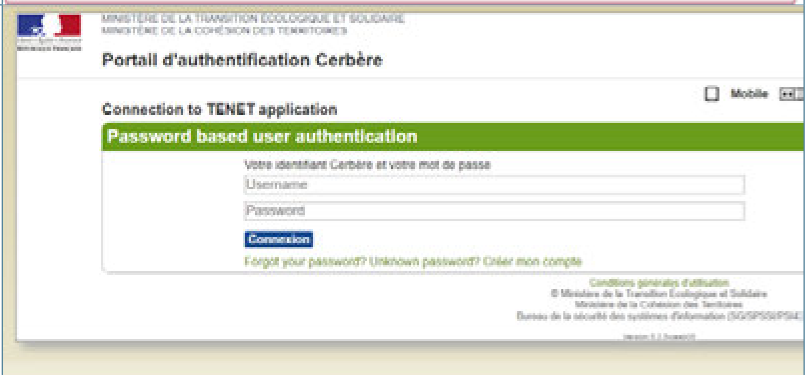
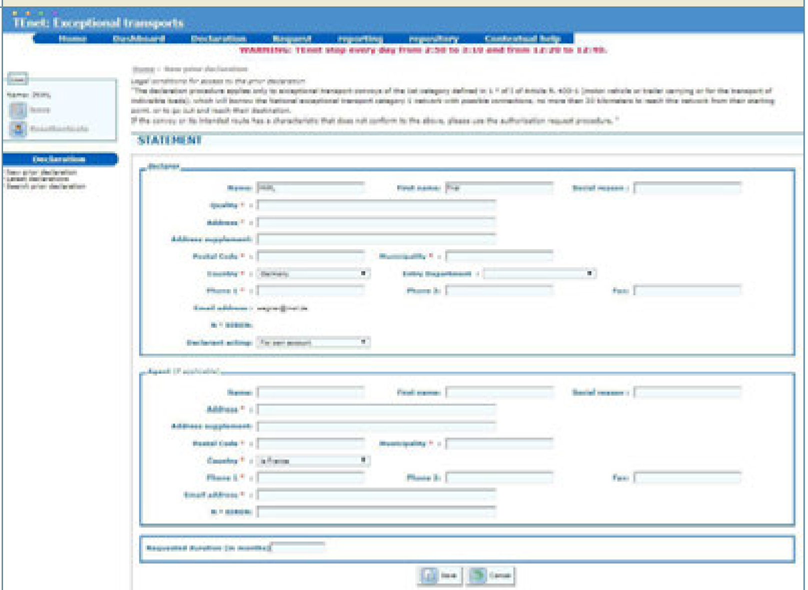
GEOGRAPHICAL ASPECTS	
Country	France
Region of implementation	General areas for France Paris and Departments of the North and the Pas-des-Calais are different
Corridor(s) or Network(s) concerned	TEN-T: Atlantic Mediterranean North Sea – Mediterranean

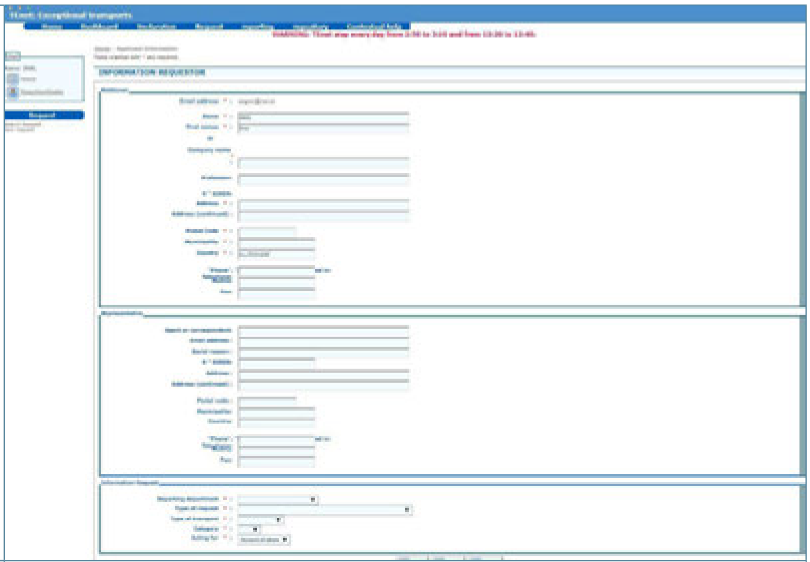
ITS SERVICE DESCRIPTION	
General Objectives	☒ Reduction of congestion ☒ Increase of safety ☐ Reduction of environmental damage ☒ Protection of the road infrastructure ☐ Increase traveller comfort ☐ Other
Specific Objectives	☐ Change the distribution in time of transport in order to achieve a more even allocation, avoiding peaks (access restrictions, fees) ☐ Change the distribution of transport in space in order to achieve a more even distribution on the network and prevent "wrong vehicles on wrong places" (traffic control, traffic management, traffic information, access restrictions) ☐ Change the composition of vehicles on a certain piece of infrastructure (access restrictions, fees) ☐ Manage the flow on a given road section in order to reduce speed variation and thus improve the capacity and reduce the risk of incidents ☒ Manage access to a given road section in order to prevent disturbances and reduce the risk of incidents (e.g. ramp metering) ☐ Increase the speed on the link and thus increase capacity (throughput) ☐ Reduce the risk of incidents and traffic disruptions through better informed infrastructure users (traffic and traveller information) ☐ Reduce the consequences from disruptions through fast countermeasures (incident response time) ☐ Reduce traffic volumes through redistributing transport between transport modes ☐ Other
Short narrative description of your best practice including e.g. geographical dimension, numbers, target group like HGV or passengers, costs etc.	A special transport for the movement in abnormal transport of goods, machinery or vehicles whose dimensions or weight exceed regulatory limits and are likely to obstruct traffic or cause accidents. This transport is subject to prior authorization and strict conditions. Apply through Authentication portal Cerberus Connection to TENET application
Relation with national access point set up according to EC Delegated Regulations	☐ Provide information to the national access point ☐ Receive information from the national access point ☐ No connection to the national access point
Information provision to end users	☒ Web portal ☐ Phone app ☐ VMS ☐ In-vehicle information ☒ Other: Manual Fill In Form

IMPLEMENTATION ASPECTS	
Year of implementation (+ end date of measure if applicable)	Open since 29 September 2014
Technical description	TEnet is a teleprocedure which consists of entering, in electronic format, abnormal transport authorization requests which were previously documented in the Cerfa forms. TEnet offers new features, not only for instructor services but also for carriers, who can, for example, consult the status of each application.

	Objectives and challenges of TEnet As part of the modernization of the administration, the Directorate of Road Safety and Traffic (DSCR) has decided to develop the TEnet application, teleprocedure management of exceptional transport orders. Regulatory reminder: are subject to the provisions of the order of May 4, 2006, in application of the Highway Code, the transport of goods or the circulation of vehicles or vehicles and sets of vehicles comprising more than one trailer and having a character exceptional because of their size or mass, exceeding the regulatory limits of the Highway Code. Exceptional transport may only be used on roads open to public traffic under cover of an authorization called "exceptional transport". The application for authorization must be transmitted by the petitioner to the instructing service concerned, which prepares it on behalf of the prefect. The individual authorization is then issued according to the category of transport defined by the characteristics of the convoy (length, width and mass). The strongest characteristic determines the category of transport. With the setting up of TEnet, the aim is for petitioners to go through the portal to submit their application for authorization of Transport Exceptionnel. However, in some cases (for example: no internet access), the instructor may have to make an application for authorization on behalf of the petitioners. Individual authorization can be: ▪ travel on a specific route (issued for a specified number of trips and a defined period); ▪ permanent on a specific route (issued for an unlimited number of journeys made in connection with the transport of the same type of load or the movement of gear of the same kind and for a fixed period); ▪ permanent on a pre-established network (issued for an unlimited number of trips carried out within the framework of the transport of the same nature of loading or the circulation of gear of the same nature and for a definite duration). The maximum validity period of an authorization is 60 months (5 years).
Lessons learnt / factor of success / topics considered as good practice (technical, legal, organisational, financial)	The advantages of TEnet are that it ▪ facilitates and accelerates the processing of requests by the instructor services because it prevents them from re-entering the information that you have provided. ▪ This allows to have a better visibility on the progress of requests in all the departments concerned, ▪ this saves time sending a paper copy of records to all the instructor departments of the departments through which ▪ it allows the access to the same calculation tool as the instructor services, since it is automatically connected with TEnet As far as input is concerned, it is the same information that you provide in paper format that you are requested
Impacts assessment / results (if available)	

ILLUSTRATIONS

	
A Cerbère log in is required to use the actual Tenet: online application for exceptional individual transport authorization.	
New prior declaration	
	Declaration: creation / search of preliminary declarations concerning 1st category applications using the national network of 1st category Tes Legal conditions for access to the prior declaration “The declaration procedure applies only to exceptional transport convoys of the 1st category defined in 1 ° of I of Article R. 433-1 (motor vehicle or trailer carrying or for the transport of indivisible loads), which will borrow the National exceptional transport category 1 network with possible connections, no more than 20 kilometers to reach this network from their starting point, or to go out and reach their destination. If the convoy or its intended route has a characteristic that does not conform to the above, please use the authorization request procedure. “

New individual request	
	When requesting a new authorization several factors have to be chosen: Specifically under Information Request the user has to enter very specifc information regarding: - Their departing department (e.g. Ain, Dawn) - Type of request: - 1. Permanent/ On a precise itinerary - 2. Permanent on departmental network with connection at departure - 3. Permanent on one of the five TE networks with inital connection - 4. Permanent/ to travel connection (departure or arrival) - 5. Standing on one of the five TE road networks - 6. Permanent on departmental networks - 7. Permanent on departmental network and one of the five TE road networks - Type of transport: Haulage or Machina traffic - Categroy: 1,2 or 3 - Acting for: Own account or account of others
	Additionally within the TENET online portal vehicles can be entered into the system based on the information: ▪ Vehicle label ▪ Registration number ▪ Type of vehicle: Rear-Train , Self - propelled (except crane), Truck, ... ▪ Mark of the vehicle
Many features were not available or error warnings were shown as of May 14th 2018. Therefore a whole application process was not possible.	

REFERENCES	
Documentation available on the project	Public Services France
Web link	http://www.transports-exceptionnels.developpement-durable.gouv.fr/tenet-r328.html https://www.service-public.fr/professionnels-entreprises/vosdroits/R19003

1.3.2.3 Transport XXL

GENERAL INFORMATION	
Name of service/system/project	Transport XXL
Name of operator/organisation	Danish Road Directorate CPL Competence in Ports and Logistics GmbH ELY-center for Pirkanmaa Norwegian Road Administration Swedish Road Administration
Service delivery	☐ Public ☐ Private
Mainly applicable Deployment Guideline	FLS DG02
Other relevant Deployment Guideline(s)	n/a
Contact for more information	CPL Competence in Ports and Logistics GmbH www.c-pl.de info@c-pl.de

GEOGRAPHICAL ASPECTS	
Country	Europe
Region of implementation	Denmark Germany Great Britain Finland Netherlands Norway Spain Sweden
Corridor(s) or Network(s) concerned	n/a

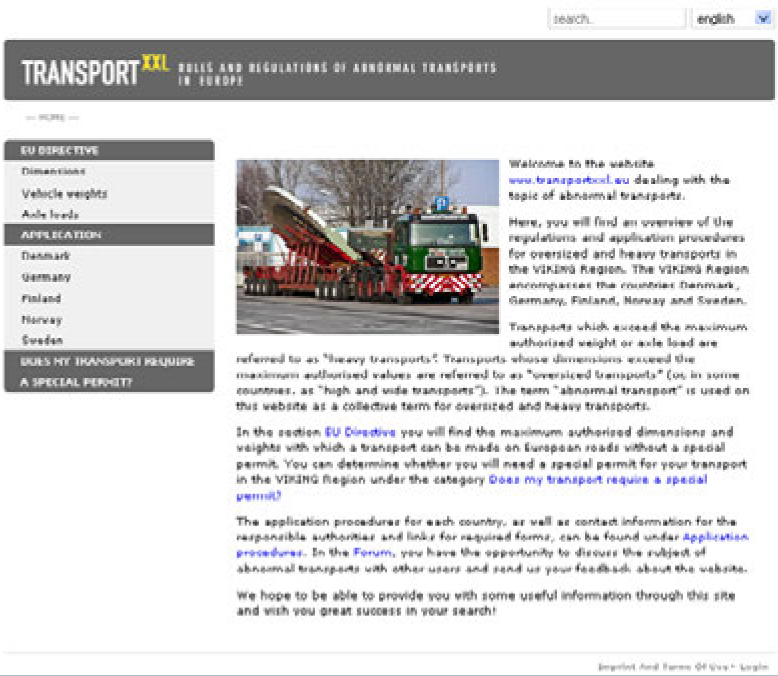
ITS SERVICE DESCRIPTION	
General Objectives	☐ Reduction of congestion ☐ Increase of safety ☐ Reduction of environmental damage ☐ Protection of the road infrastructure ☐ Increase traveller comfort ☐ Other: United web portal with information on abnormal transport
Specific Objectives	☐ Change the distribution in time of transport in order to achieve a more even allocation, avoiding peaks (access restrictions, fees) ☐ Change the distribution of transport in space in order to achieve a more even distribution on the network and prevent "wrong vehicles on wrong places" (traffic control, traffic management, traffic information, access restrictions) ☐ Change the composition of vehicles on a certain piece of infrastructure (access restrictions, fees) ☐ Manage the flow on a given road section in order to reduce speed variation and thus improve the capacity and reduce the risk of incidents ☐ Manage access to a given road section in order to prevent disturbances and reduce the risk of incidents (e.g. ramp metering) ☐ Increase the speed on the link and thus increase capacity (throughput) ☐ Reduce the risk of incidents and traffic disruptions through better informed infrastructure users (traffic and traveller information) ☐ Reduce the consequences from disruptions through fast countermeasures (incident response time) ☐ Reduce traffic volumes through redistributing transport between transport modes ☐ Other

Short narrative description of your best practice including e.g. geographical dimension, numbers, target group like HGV or passengers, costs etc.	Overview of the regulations and application procedures for oversized and heavy transports in the EU. Currently the website contains information for the following EU countries: Denmark, Germany, Great Britain, Finland, France, Netherlands, Norway, Spain and Sweden.
Relation with national access point set up according to EC Delegated Regulations	☐ Provide information to the national access point ☐ Receive information from the national access point ☐ No connection to the national access point
Information provision to end users	☐ Web portal ☐ Phone app ☐ VMS ☐ In-vehicle information ☐ Other

IMPLEMENTATION ASPECTS

Year of implementation (+ end date of measure if applicable)	n/a
Technical description	The website gathers information from different road authorities and display it on a centralized website. The application procedures for each country, as well as contact information for the responsible authorities and links for required forms, can be found on the website.
Lessons learnt / factor of success / topics considered as good practice (technical, legal, organisational, financial)	n/a
Impacts assessment / results (if available)	n/a

ILLUSTRATIONS



Introduction

search english

TRANSPORT XXL RULES AND REGULATIONS OF ABNORMAL TRANSPORTS IN EUROPE

— HOME / APPLICATION / GERMANY —

EU DIRECTIVE
- Dimensions
- Vehicle weights
- Axle loads

APPLICATION
- Denmark
- Germany
  - Contact search
  - Application form
- Finland
- Norway
- Sweden

DOES MY TRANSPORT REQUIRE A SPECIAL PERMIT?

Germany

The authorised dimensions, weights and axle loads which a transport in Germany may not exceed are laid down by the StVZO, Germany's Road Traffic Licensing Regulations, and the StVO, Germany's Road Traffic Regulations. Permits for abnormal transports in Germany are issued in the form of single permits (Einzelerlaubnis), general permits (Dauererlaubnis) and special permits (Ausnahmegenehmigung).

For heavy transports, the **vehicles and vehicle combinations** whose dimensions, axles loads and/or total laden weight exceed the limits specified by the StVZO require an special permits (Ausnahmegenehmigung) in accordance with § 70 StVZO for the special technical equipment of the vehicle. This permit also specifies guidelines for the attachment of safety equipment such as warning signs and flashing lights or the repositioning of side lights. The Ausnahmegenehmigung can also be included in the documents delivered with the vehicle from the manufactures

The **use of the vehicle for a specific transport**, including load, must be approved separately. For this purpose, an application must be submitted for either an single permit (Einzelerlaubnis) or a general permit (Dauererlaubnis) in accordance with § 29 StVO. In this context, the responsible authorities will assess whether the vehicle can be used on the planned route with transport dimensions and/or weights which are above the legal limits with respect to road conditions/parameters and traffic considerations. A Dauererlaubnis is valid for a period of up to three years for one or more specified routes. The Einzelerlaubnis is generally valid for one or more trips within a onemonth period on one or more specified routes.

If the vehicle itself complies with the legal limits for dimensions and weights but is to be used for transporting a load which projects past the boundaries of the vehicle, a special permit (Ausnahmegenehmigung) in accordance with § 46 StVO for the transport of loads with excessive widths, heights or lengths must be requested.

The applications related to §§ 46 and 29 StVO have been combined in one form.

The responsible authorities vary from state to state. In some cases, all applications can be applied for at the lower traffic authorities on the municipal level. Or a higher traffic authority on the state level is responsible (as in the states of Mecklenburg Vorpommern and Brandenburg).

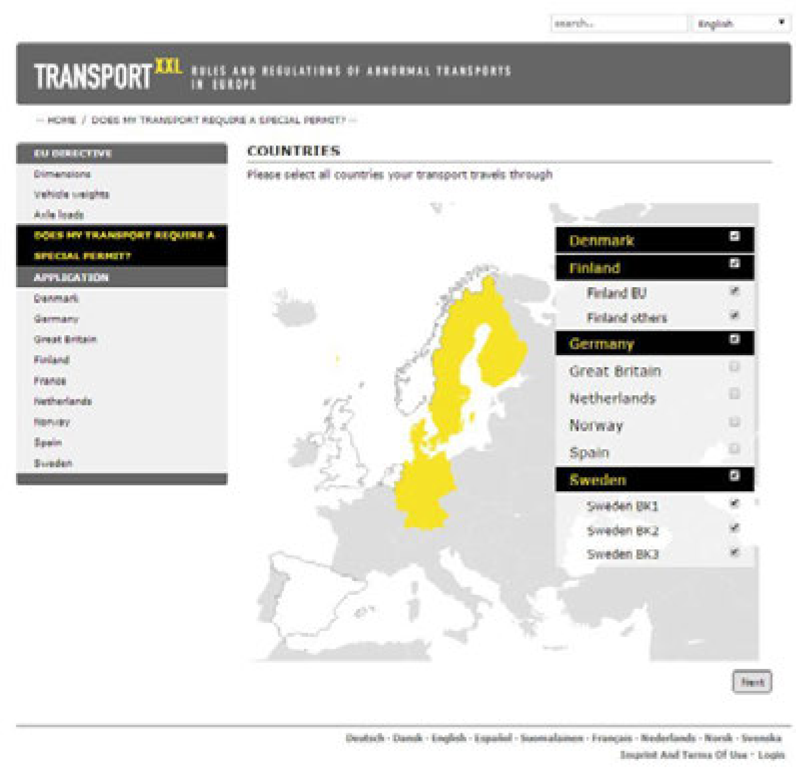
For applications regarding oversized transports, the information on axle-load, distance between axles and on tyres is not required.

If the transport shall cross the borders of other municipalities or administrative districts, (intra official) permits from the other affected authorities must be collected through the responsible traffic authority. The application from the haulage contractor cannot be approved until these permits have been issued. Currently, this communication between the municipalities is generally carried out in paper form because of the differences in the procedures followed by the individual municipalities for the processing of applications and permits. The responsible municipality will assess whether the route specified in the application is passable for the transport with respect to dimensions and weight. The permit may include special conditions such as the lowering of the load when passing beneath bridges, the dismantling of signs, the removal of construction sites, the trimming of greenery, the requirement of a police escort or escort by private safety vehicles, or a non-stopping provision for certain sections of the route.

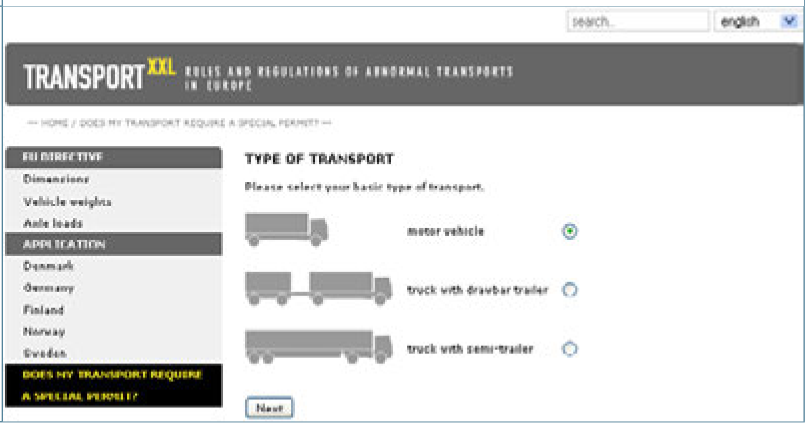
The application procedure takes, on average, between one and three weeks, and the fees, in accordance with the official fee scale for road traffic measures, can amount to between 10.20 and 767.00 euros.

Imprint And Terms Of Use · Login

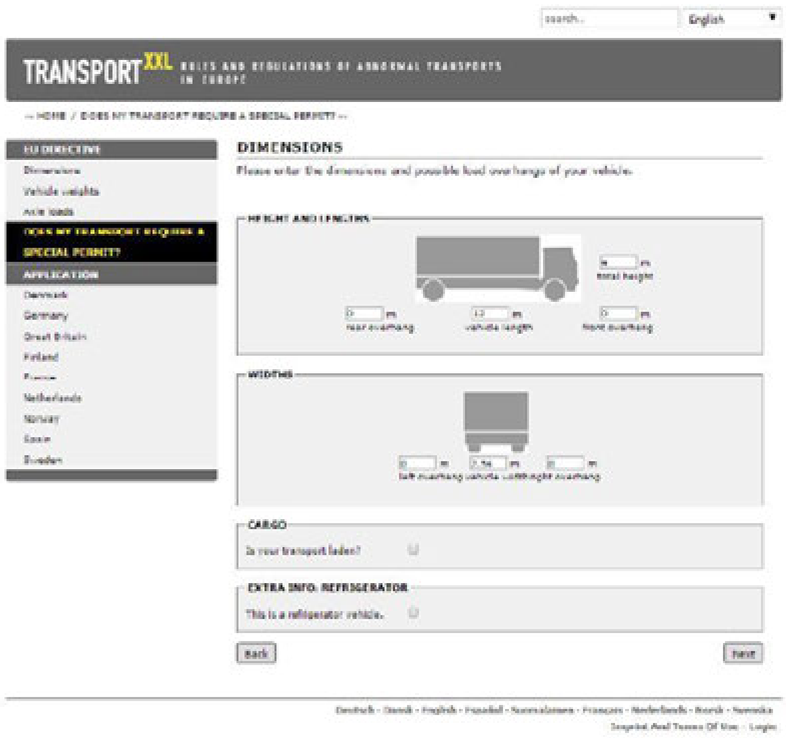
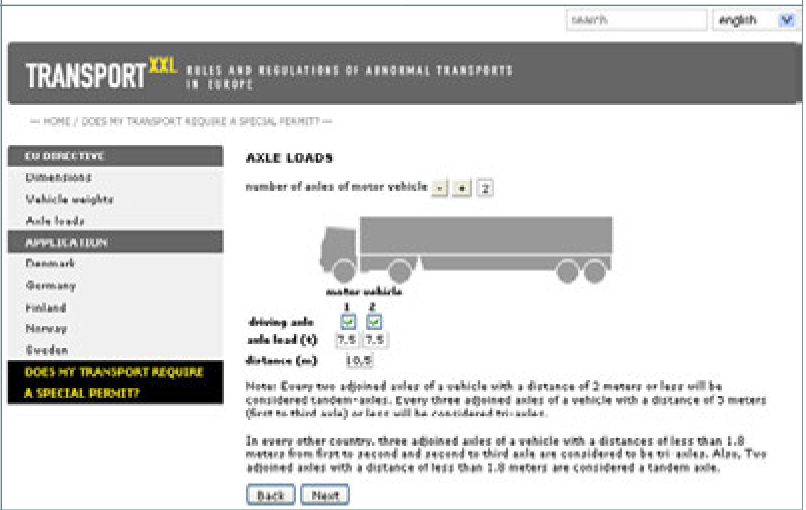
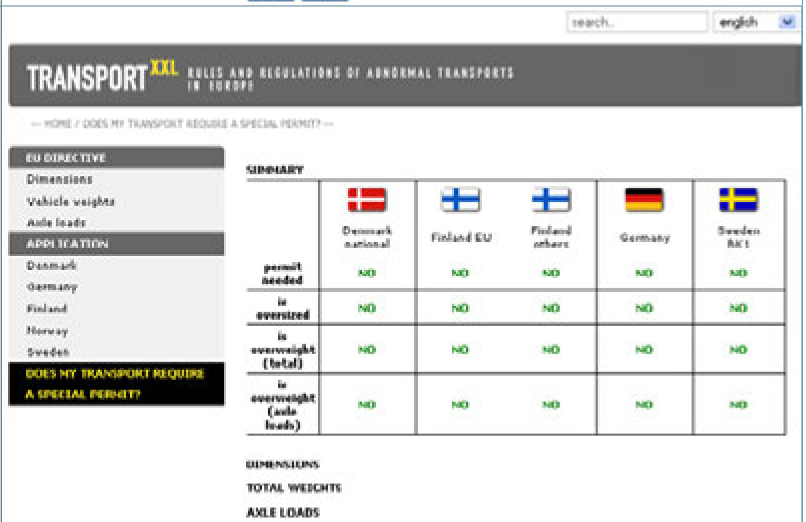
Introduction Page

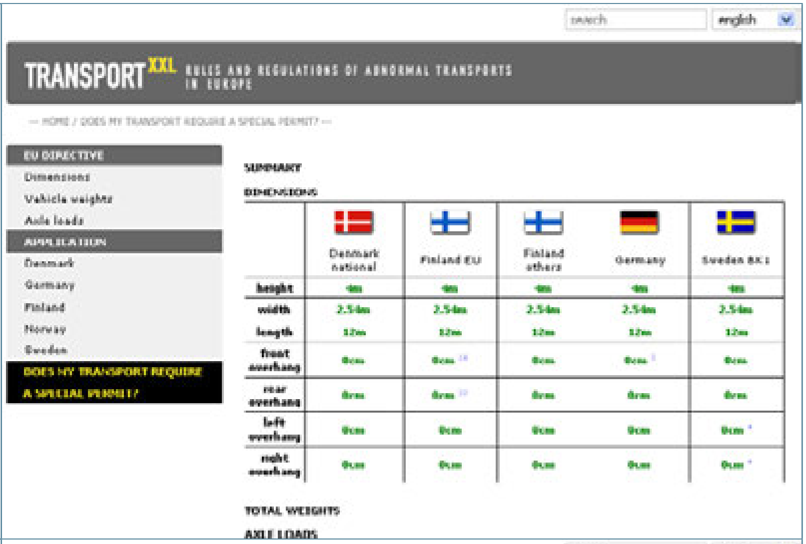


Explementary page for one Country in this case Germany.

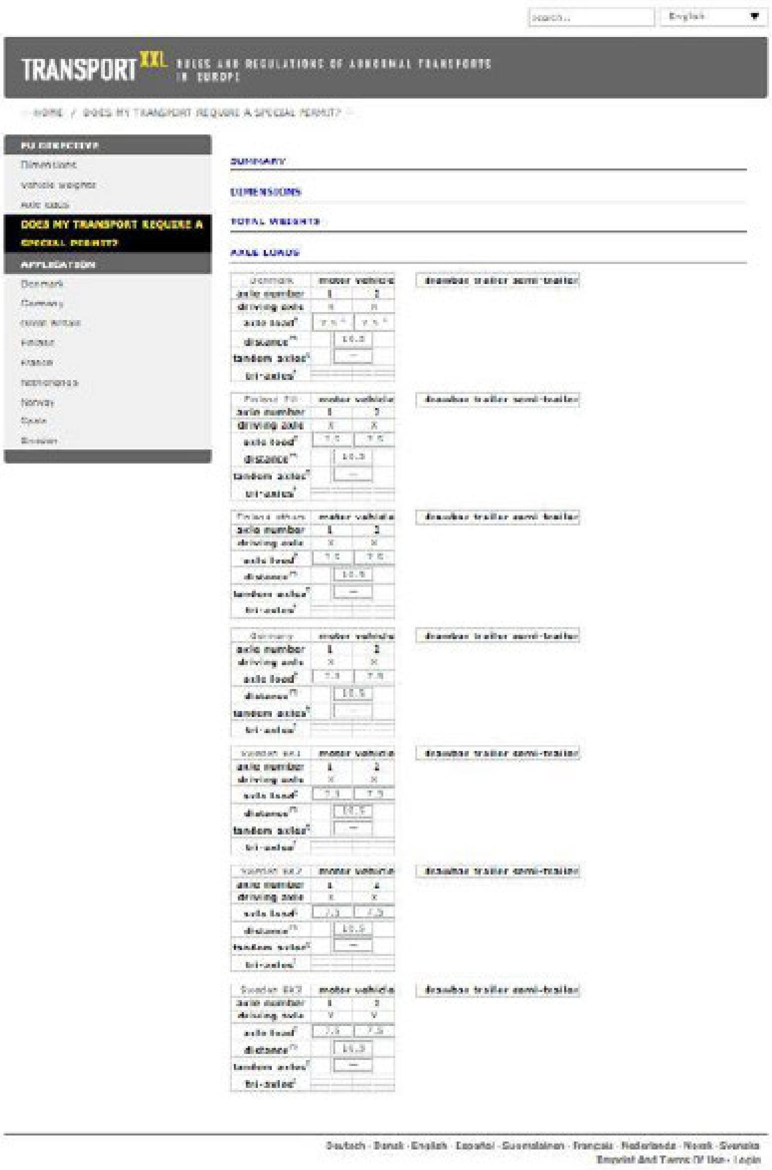


Selection of countries through the transport travels.

Selecting the type of transport	
Selecting the dimensions of the transport	
Axle load selection	



Summary screenshots



REFERENCES	
Documentation available on the project	n/a
Web link	http://www.transportxxl.eu/en/documents/home

1.3.2.4 Traza

GENERAL INFORMATION	
Name of service/system/project	Traza
Name of operator/organisation	Ministerio del Interior - D.G.T
Service delivery	☐ Public ☐ Private
Mainly applicable Deployment Guideline	F&L-DG02
Other relevant Deployment Guideline(s)	n/a
Contact for more information	Administración Traza: traza@centroestrada.es

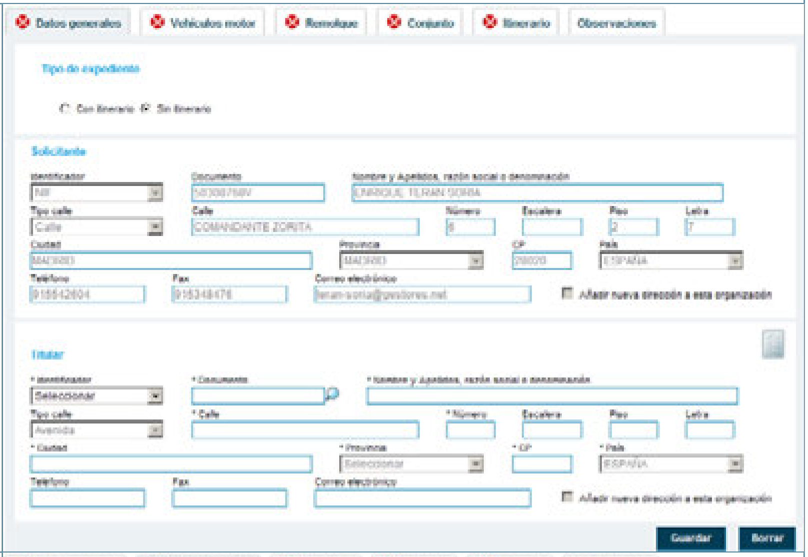
GEOGRAPHICAL ASPECTS	
Country	Spain
Region of implementation	Spain
Corridor(s) or Network(s) concerned	TEN-T Atlantic TEN-T Mediterranean

ITS SERVICE DESCRIPTION	
General Objectives	☐ Reduction of congestion ☐ Increase of safety ☐ Reduction of environmental damage ☐ Protection of the road infrastructure ☐ Increase traveller comfort ☐ Other: United web portal with information on abnormal transport
Specific Objectives	☐ Change the distribution in time of transport in order to achieve a more even allocation, avoiding peaks (access restrictions, fees) ☐ Change the distribution of transport in space in order to achieve a more even distribution on the network and prevent "wrong vehicles on wrong places" (traffic control, traffic management, traffic information, access restrictions) ☐ Change the composition of vehicles on a certain piece of infrastructure (access restrictions, fees) ☐ Manage the flow on a given road section in order to reduce speed variation and thus improve the capacity and reduce the risk of incidents ☐ Manage access to a given road section in order to prevent disturbances and reduce the risk of incidents (e.g. ramp metering) ☐ Increase the speed on the link and thus increase capacity (throughput) ☐ Reduce the risk of incidents and traffic disruptions through better informed infrastructure users (traffic and traveller information) ☐ Reduce the consequences from disruptions through fast countermeasures (incident response time) ☐ Reduce traffic volumes through redistributing transport between transport modes ☐ Other
Short narrative description of your best practice including e.g. geographical dimension, numbers, target group like HGV or passengers, costs etc.	Online application system for abnormal transport in Spain. General information about the transport is queried. This includes information such as the axles, load as well as the route of the transport.
Relation with national access point set up according to EC Delegated Regulations	☐ Provide information to the national access point ☐ Receive information from the national access point ☐ No connection to the national access point

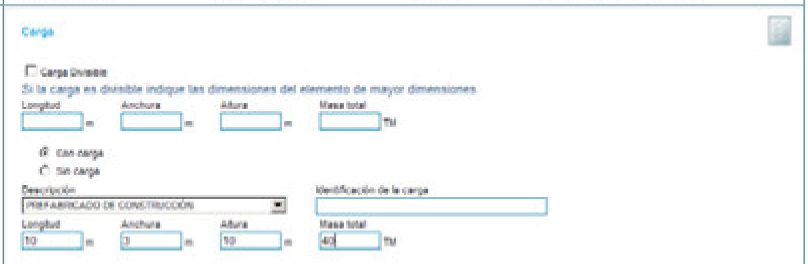
Information provision to end users	☐ Web portal ☐ Phone app ☐ VMS ☐ In-vehicle information ☐ Other

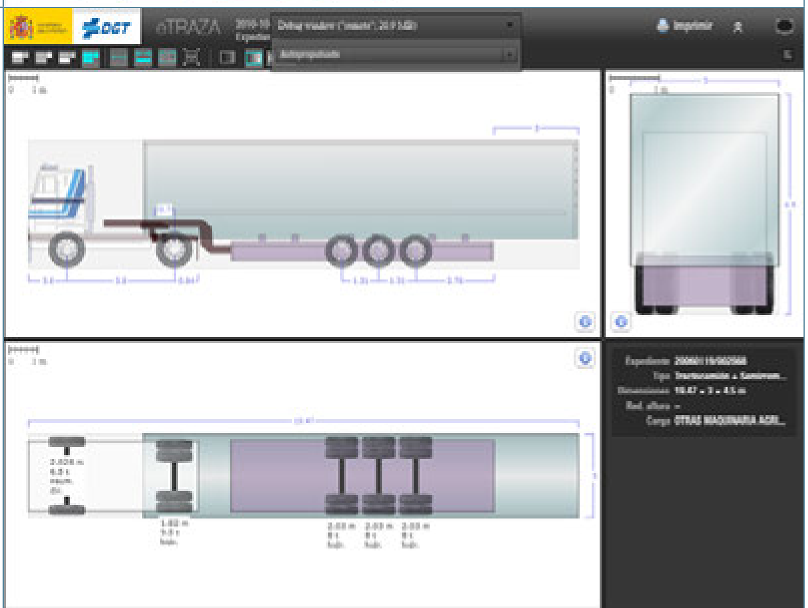
IMPLEMENTATION ASPECTS	
Year of implementation (+ end date of measure if applicable)	n/a
Technical description	Online system. Information about the engine, the trailer, the route and other important information about the vehicle and route are queried.
Lessons learnt / factor of success / topics considered as good practice (technical, legal, organisational, financial)	n/a
Impacts assessment / results (if available)	n/a

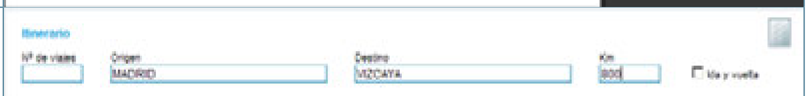
ILLUSTRATIONS

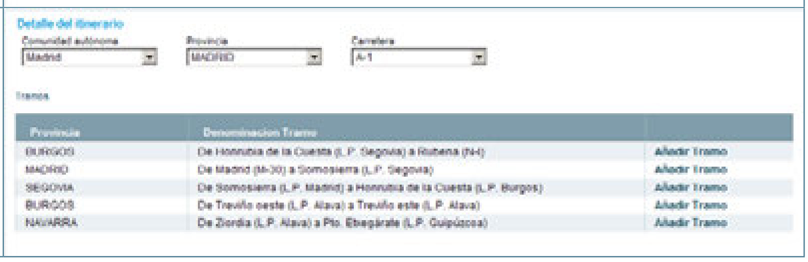



Identificación del modular
Identificación
Una sola matrícula
Fabricante
TRABOSA
Matrícula
E9572BBG
Número bastidor
VWFGL09543ET21595
Tipo
GL095
Clasificación del vehículo (Según T.técnica)
Longitud mínima
Longitud máxima
Tara
28.0
MTMA
120.0
Velocidad
60.0
Km/h
Anchura
2.7
Longitud
22.045
Guardar
Composición del modular
Módulo
Seleccionar
Especificación
Seleccionar
Cuello de Cisne
Rodante 2 ejes
Cama
Rodante 4 ejes
eliminar


Carga
Carga Divisible
Si la carga es divisible indique las dimensiones del elemento de mayor dimensiones
Longitud
Anchura
Altura
Masa total
Con carga
Sin carga
Descripción
PREFABRICADO DE CONSTRUCCIÓN
Identificación de la carga
10
3
10
40


DGT
eTRAZA
Imprimir


Itinerario
Nº de viajes
Origen
MADRID
Destino
VIZCAYA
Km
800
Ida y vuelta


Detalle del itinerario
Comunidad autónoma
Madrid
Provincia
MADRID
Carretera
A-1
Tramos
Provincia
Denominacion Tramo
BURGOS
De Honrubia de la Cuesta (L.P. Segovia) a Rubena (N-I)
Añadir Tramo
MADRID
De Madrid (M-30) a Somosierra (L.P. Segovia)
Añadir Tramo
SEGOVIA
De Somosierra (L.P. Madrid) a Honrubia de la Cuesta (L.P. Burgos)
Añadir Tramo
BURGOS
De Treviño oeste (L.P. Alava) a Treviño este (L.P. Alava)
Añadir Tramo
NAVARRA
De Ziordia (L.P. Alava) a Pto. Etxegarate (L.P. Guipúzcoa)
Añadir Tramo

REFERENCES	
Documentation available on the project	n/a
Web link	https://sedeapl.dgt.gob.es/eTrazaCliente/login.jsp

1.3.2.5 TRIX – traffic system for handling transport exemptions for internal and external users

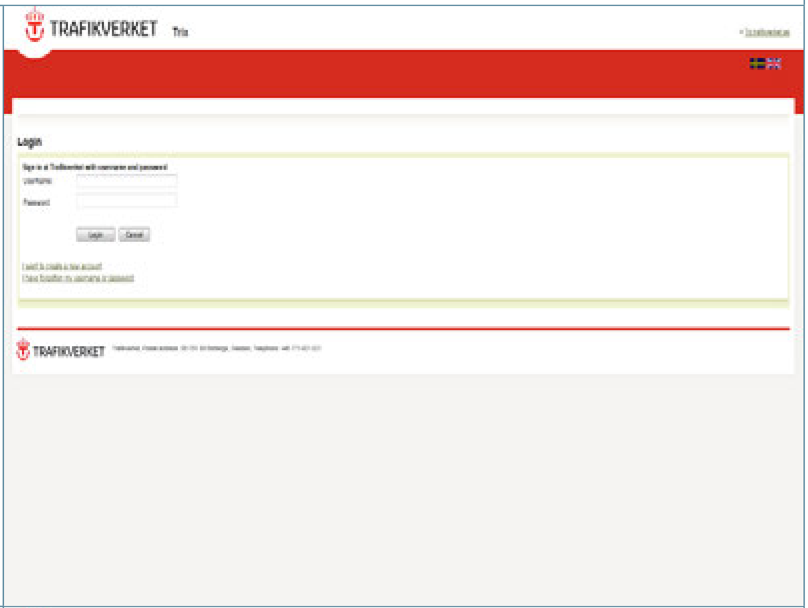
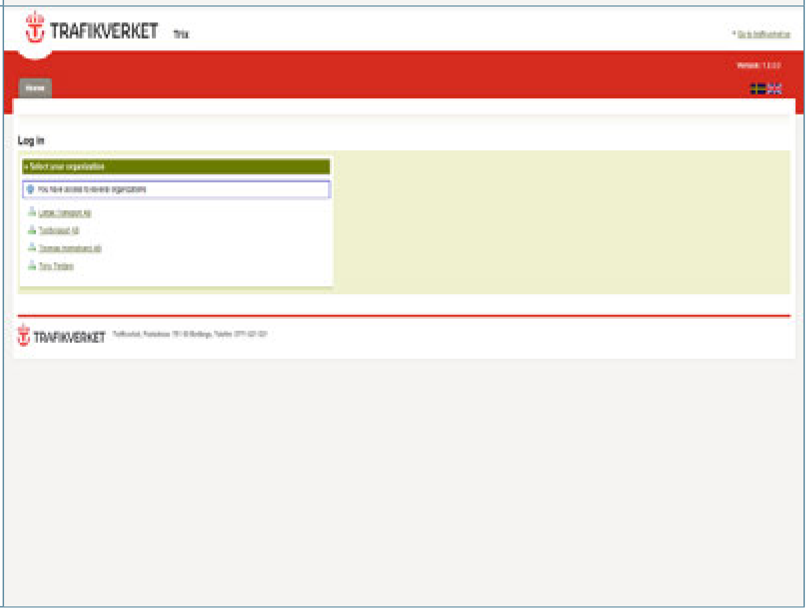
GENERAL INFORMATION	
Name of service/system/project	TRIX –traffic system for handling transport exemptions for internal and external users
Name of operator/organisation	Trafikverket – Swedish Transport Administration
Service delivery	☐ Public ☐ Private
Mainly applicable Deployment Guideline	FL DG2
Other relevant Deployment Guideline(s)	n/a
Contact for more information	http://trix.trafikverket.se Telefon: 0771-921 921

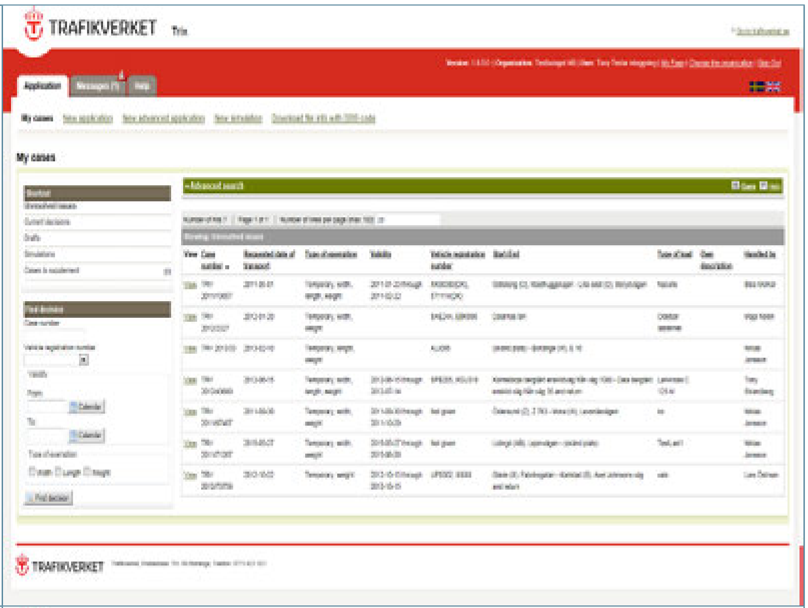
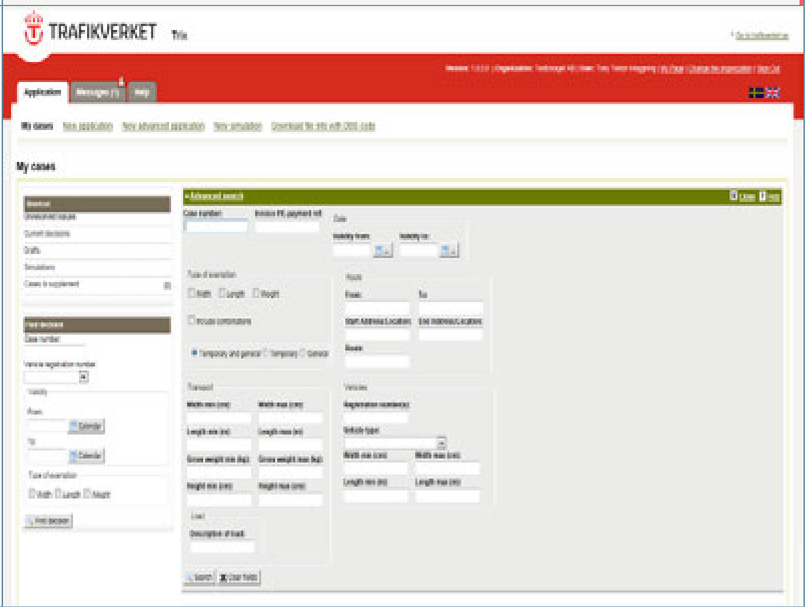
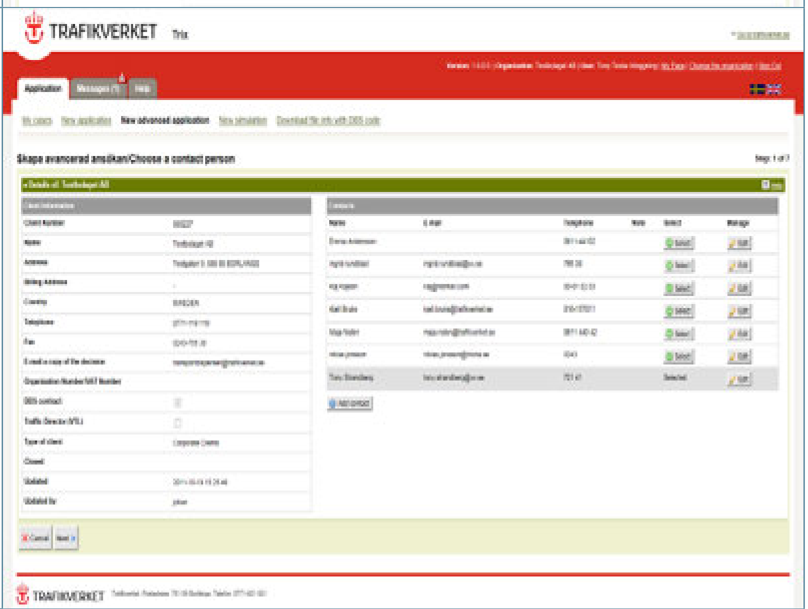
GEOGRAPHICAL ASPECTS	
Country	Sweden
Region of implementation	Sweden
Corridor(s) or Network(s) concerned	Scandinavian Mediterranean

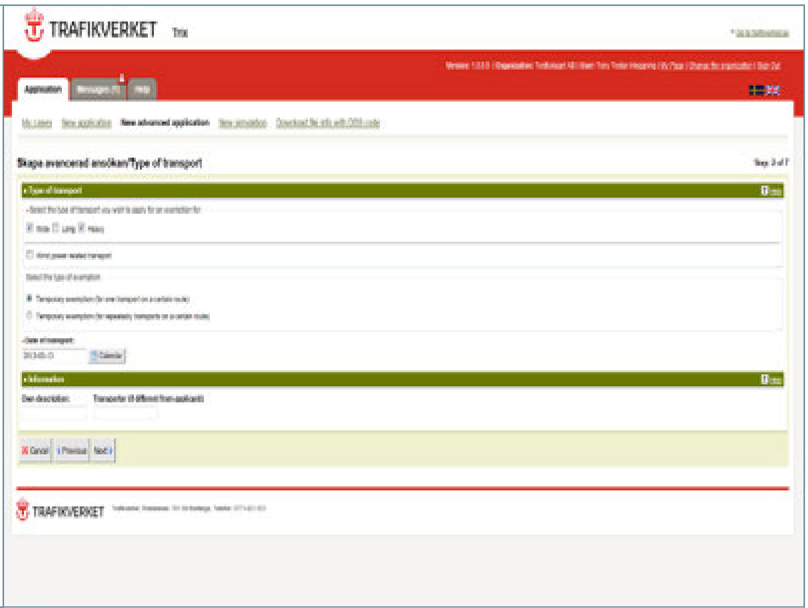
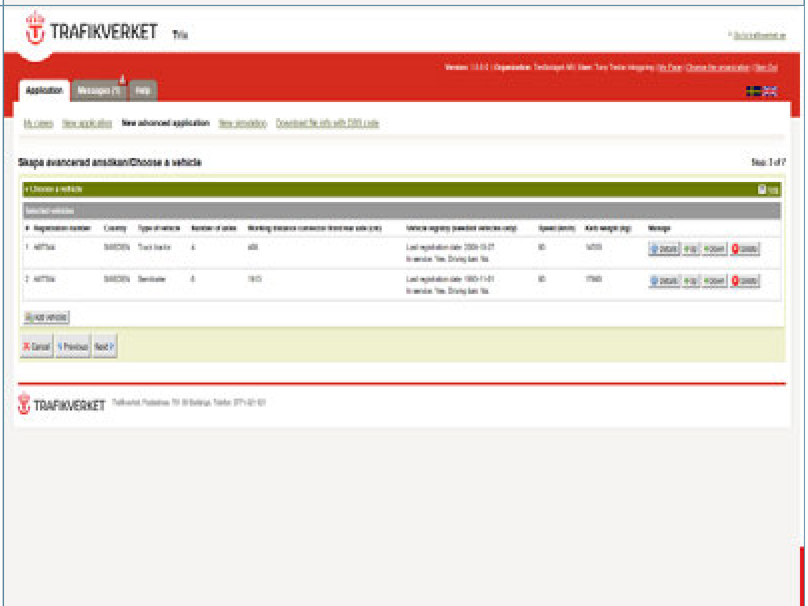
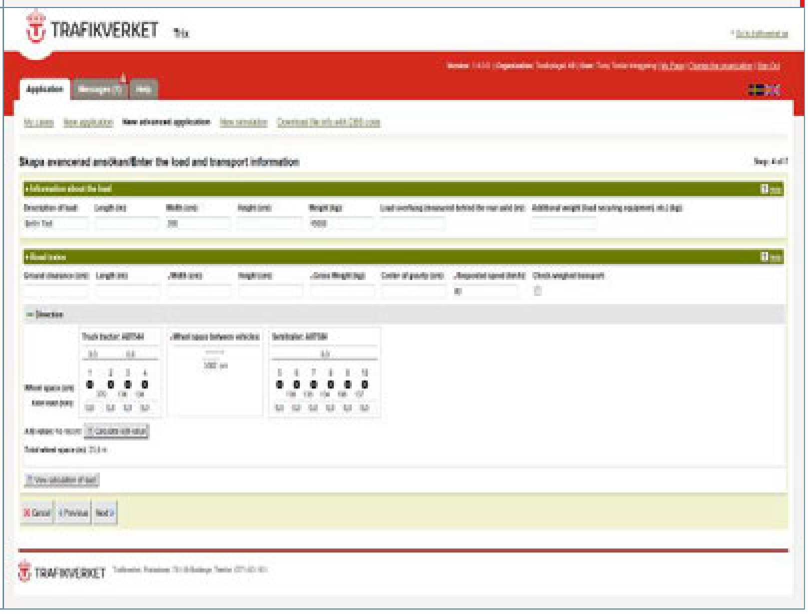
ITS SERVICE DESCRIPTION	
General Objectives	☐ Reduction of congestion ☐ Increase of safety ☐ Reduction of environmental damage ☐ Protection of the road infrastructure ☐ Increase traveller comfort ☐ Other: United web portal with information on abnormal transport

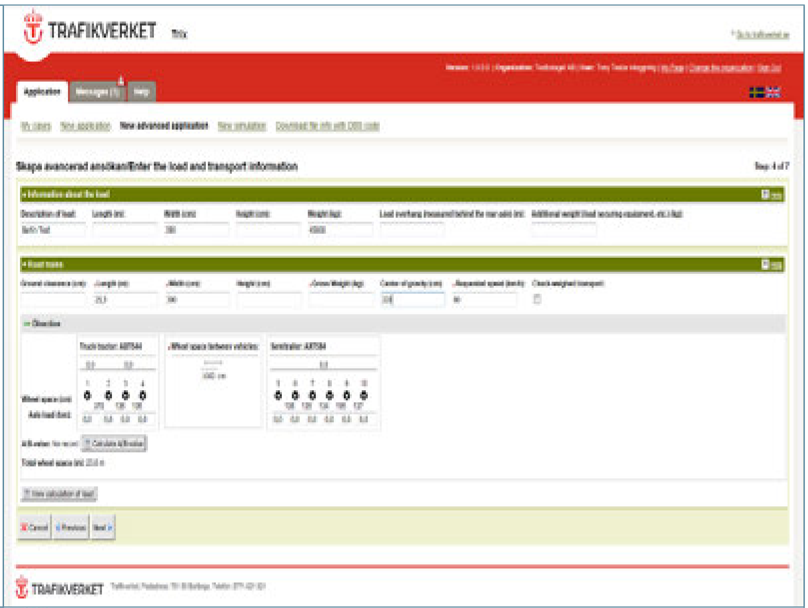
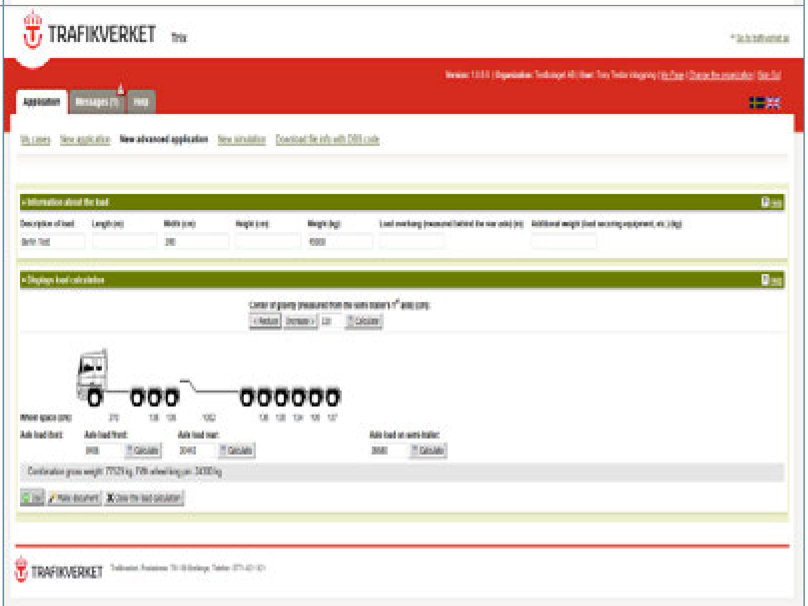
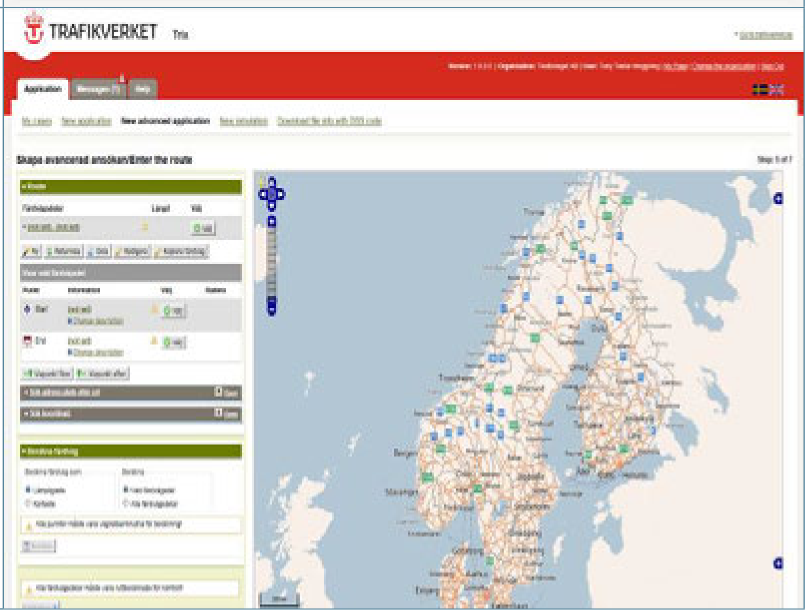
Specific Objectives	☐ Change the distribution in time of transport in order to achieve a more even allocation, avoiding peaks (access restrictions, fees) ☐ Change the distribution of transport in space in order to achieve a more even distribution on the network and prevent "wrong vehicles on wrong places" (traffic control, traffic management, traffic information, access restrictions) ☐ Change the composition of vehicles on a certain piece of infrastructure (access restrictions, fees) ☐ Manage the flow on a given road section in order to reduce speed variation and thus improve the capacity and reduce the risk of incidents ☐ Manage access to a given road section in order to prevent disturbances and reduce the risk of incidents (e.g. ramp metering) ☐ Increase the speed on the link and thus increase capacity (throughput) ☐ Reduce the risk of incidents and traffic disruptions through better informed infrastructure users (traffic and traveller information) ☐ Reduce the consequences from disruptions through fast countermeasures (incident response time) ☐ Reduce traffic volumes through redistributing transport between transport modes ☐ Other
Short narrative description of your best practice including e.g. geographical dimension, numbers, target group like HGV or passengers, costs etc.	Online exemptions system for abnormal transport. Information on weight dimensions and route are queried. The system provides a digital permit.
Relation with national access point set up according to EC Delegated Regulations	☐ Provide information to the national access point ☐ Receive information from the national access point ☐ No connection to the national access point
Information provision to end users	☐ Web portal ☐ Phone app ☐ VMS ☐ In-vehicle information ☐ Other

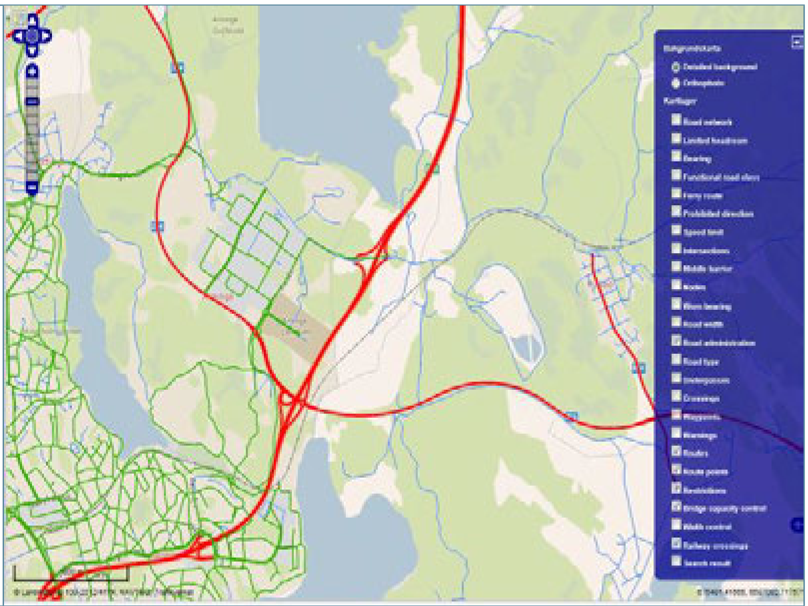
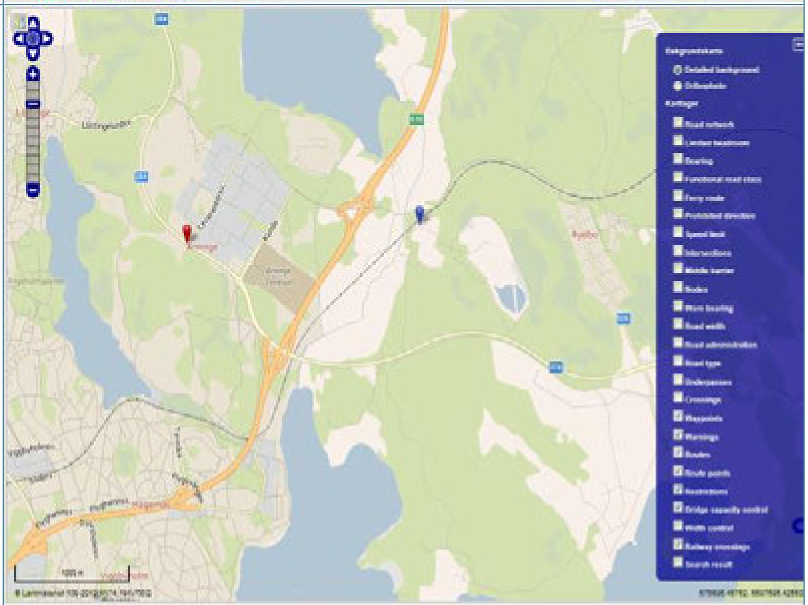
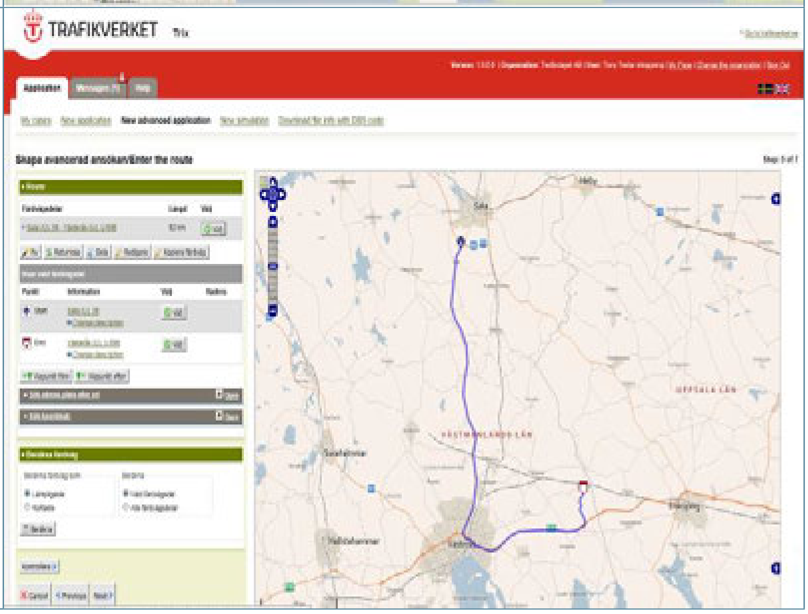
IMPLEMENTATION ASPECTS	
Year of implementation (+ end date of measure if applicable)	n/a
Technical description	Different information is queried by the system, helping to identify and displaying the best route for the abnormal transport The system has different user accessibilities. The regular user can access their application status and additional information. The advanced user can also execute simulations. And trafiverket officers have access to any information in the system.
Lessons learnt / factor of success / topics considered as good practice (technical, legal, organisational, financial)	n/a
Impacts assessment / results (if available)	n/a

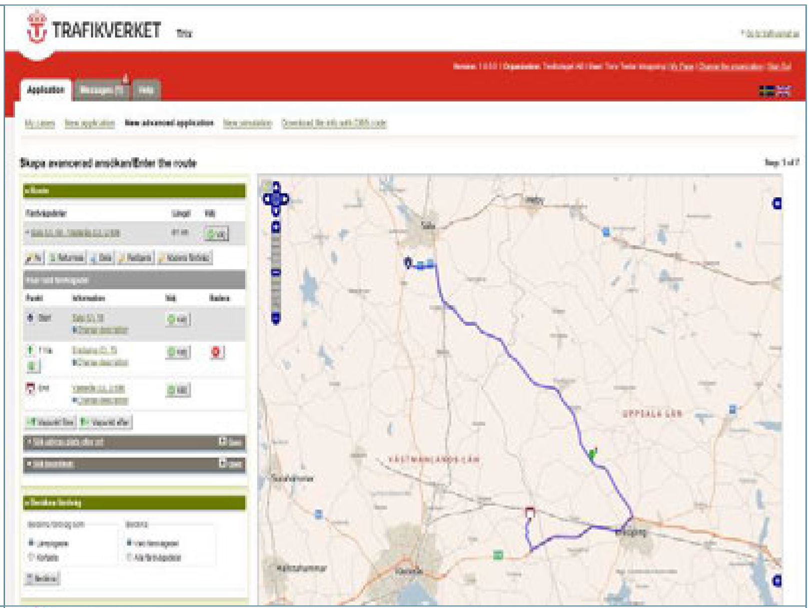
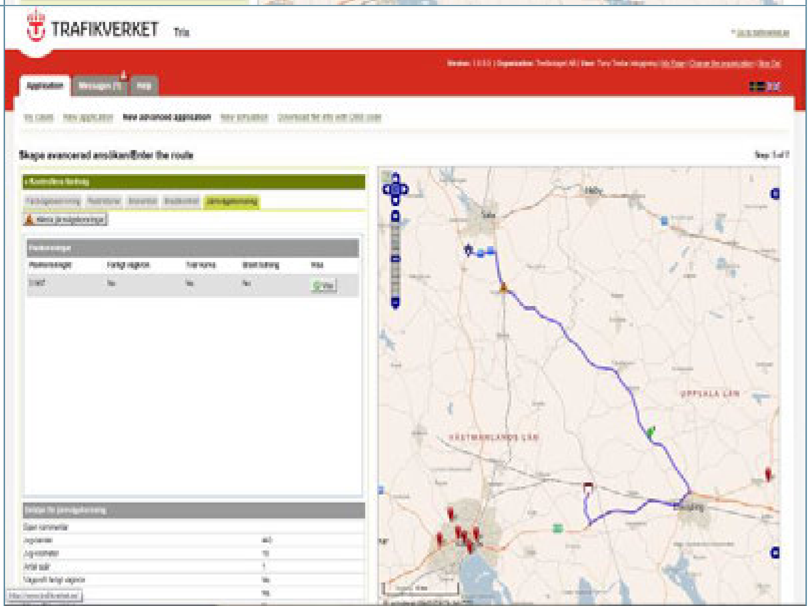
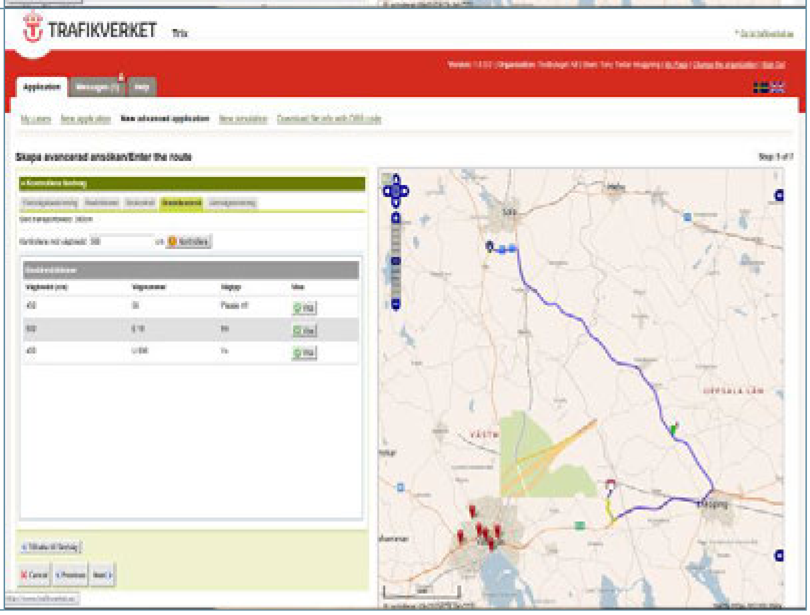
ILLUSTRATIONS	
Sig in with user name and password	
Selecting the organization EG Transport Company	

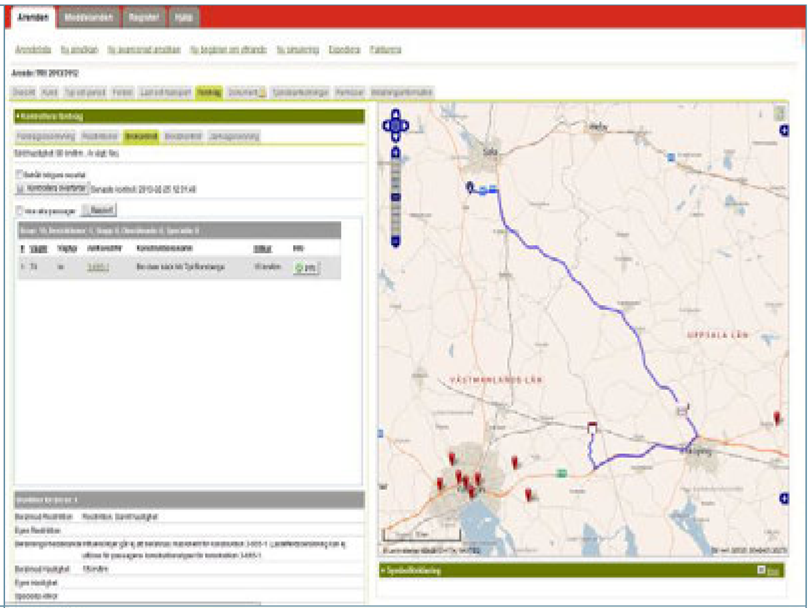
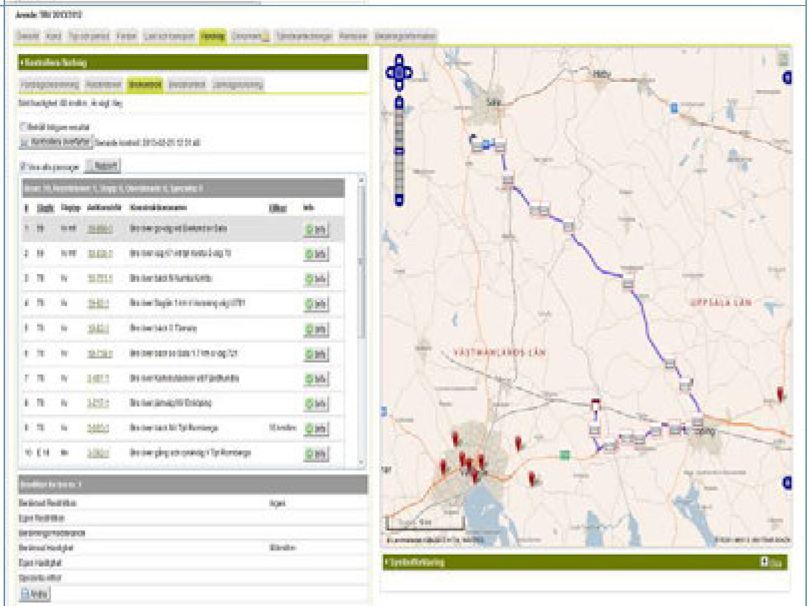
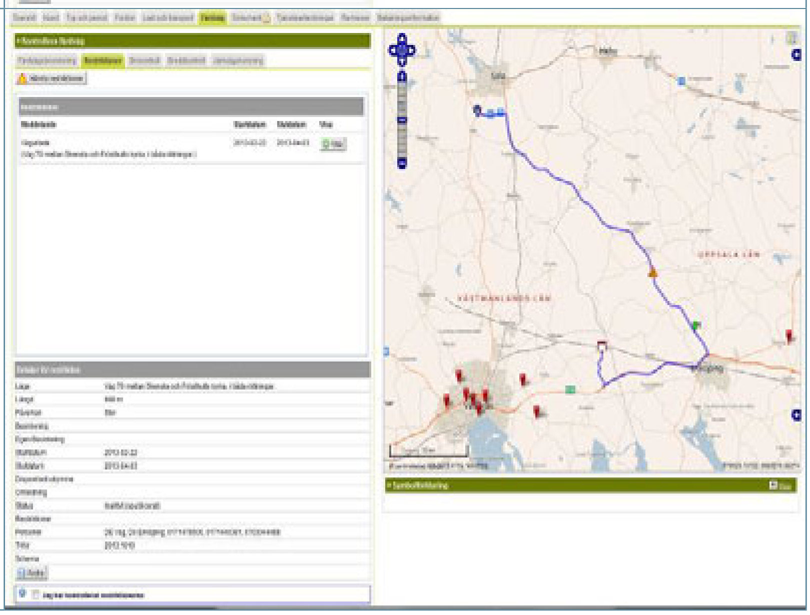
Shows different cases for the User	
	
Contact and Client Information	

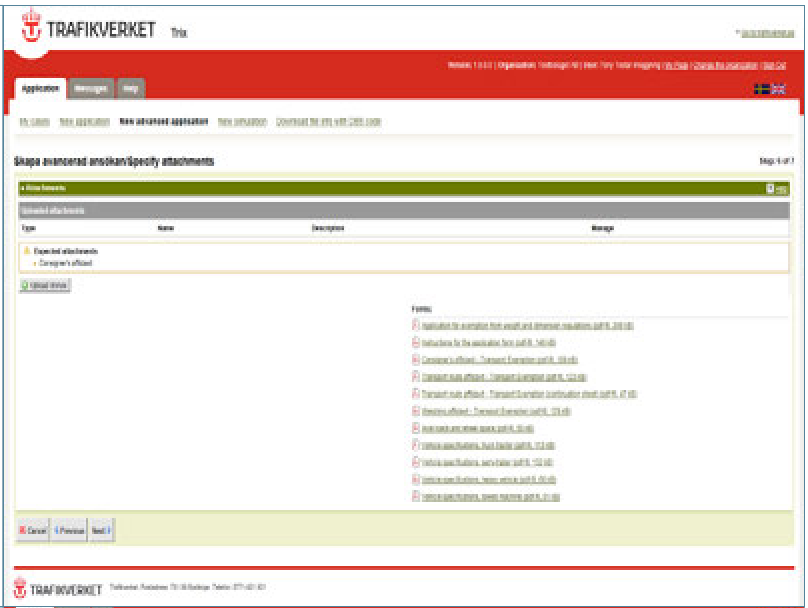
Type of transport and Date	
Vehicle selection	
Load information	

Load information and wheel space etc	
Load calculations	
Route selection	

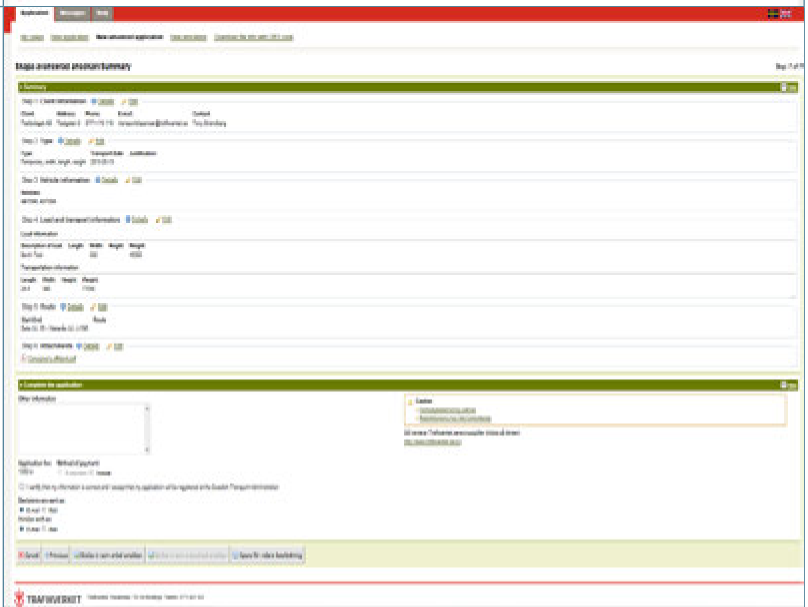
Zoomed in	
Zoomed in	
Selecting route	

Selecting route	
Enter route	
Entering route	

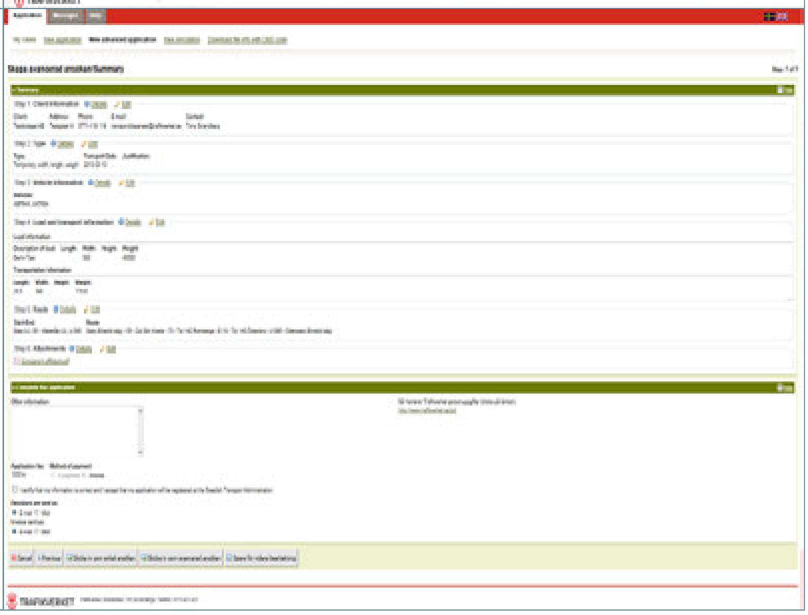
Checking of route	
Displaying route information	
Showing restrictions	



Adding attachments



Summary



Summary

REFERENCES	
Documentation available on the project	n/a
Web link	http://www.trafikverket.se/transportdispens

1.3.2.6 Vejdirektoratet – Køretøjsklassificering

GENERAL INFORMATION	
Name of service/system/project	Vejdirektoratet - Køretøjsklassificering
Name of operator/organisation	Danish Road Directorate
Service delivery	☐ Public ☐ Private
Mainly applicable Deployment Guideline	FLS-DG02 Access to Abnormal Goods Transport Regulations
Other relevant Deployment Guideline(s)	/
Contact for more information	http://www.vejdirektoratet.dk/ Vejdirektoratet Havnegade 27 1058 København K Phone: 7244 3333 Mail: vd@vd.dk

GEOGRAPHICAL ASPECTS	
Country	Denmark
Region of implementation	Denmark
Corridor(s) or Network(s) concerned	TEN-T Scandinavian - Mediterranean

ITS SERVICE DESCRIPTION	
General Objectives	☐ Reduction of congestion ☐ Increase of safety ☐ Reduction of environmental damage ☐ Protection of the road infrastructure ☐ Increase traveller comfort ☐ Other: United web portal with information on abnormal transport

Specific Objectives	☐ Change the distribution in time of transport in order to achieve a more even allocation, avoiding peaks (access restrictions, fees) ☐ Change the distribution of transport in space in order to achieve a more even distribution on the network and prevent "wrong vehicles on wrong places" (traffic control, traffic management, traffic information, access restrictions) ☐ Change the composition of vehicles on a certain piece of infrastructure (access restrictions, fees) ☐ Manage the flow on a given road section in order to reduce speed variation and thus improve the capacity and reduce the risk of incidents ☐ Manage access to a given road section in order to prevent disturbances and reduce the risk of incidents (e.g. ramp metering) ☐ Increase the speed on the link and thus increase capacity (throughput) ☐ Reduce the risk of incidents and traffic disruptions through better informed infrastructure users (traffic and traveller information) ☐ Reduce the consequences from disruptions through fast countermeasures (incident response time) ☐ Reduce traffic volumes through redistributing transport between transport modes ☐ Other
Short narrative description of your best practice including e.g. geographical dimension, numbers, target group like HGV or passengers, costs etc.	Online system to apply for heavy transport in Denmark. The system is provided by the Danish Road Directorate.
Relation with national access point set up according to EC Delegated Regulations	☐ Provide information to the national access point ☐ Receive information from the national access point ☐ No connection to the national access point
Information provision to end users	☐ Web portal ☐ Phone app ☐ VMS ☐ In-vehicle information ☐ Other

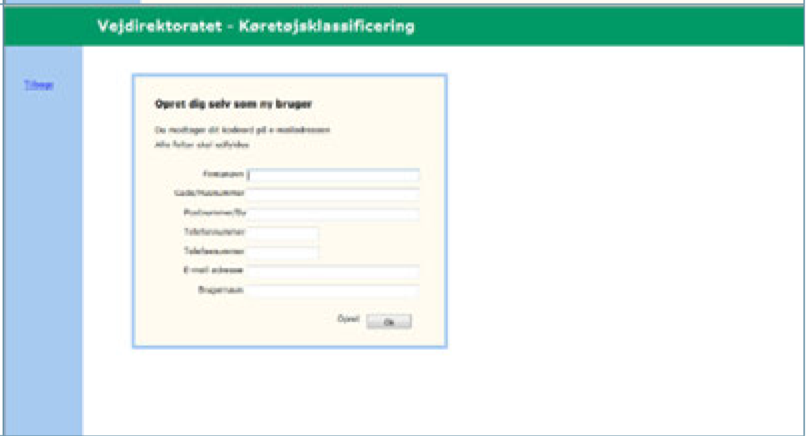
	IMPLEMENTATION ASPECTS
Year of implementation (+ end date of measure if applicable)	n/a
Technical description	Online system to apply for heavy transport in Denmark. System used to register heavy transports in Denmark and the vehicles used. The vehicle information is queried in detail e.g. the number of axles is registered, weight and length.
Lessons learnt / factor of success / topics considered as good practice (technical, legal, organisational, financial)	n/a
Impacts assessment / results (if available)	n/a

	ILLUSTRATIONS
	An online application to the approving authority "Vejdirektoratet" for classification of heavy transports shall be conducted <Erhverv>, <Tunge> by –vejdirektoratet.dk. At this point select "e-ansøgning" or follow the link: http://danbroweb.vd.dk/webklas/webklassificering.dll/Start The following start up screen will appear. Registered users have to complete the login window by indicating the user name and password. Subsequent press <Enter> or click <Ok>. Please consider upper and lower case.

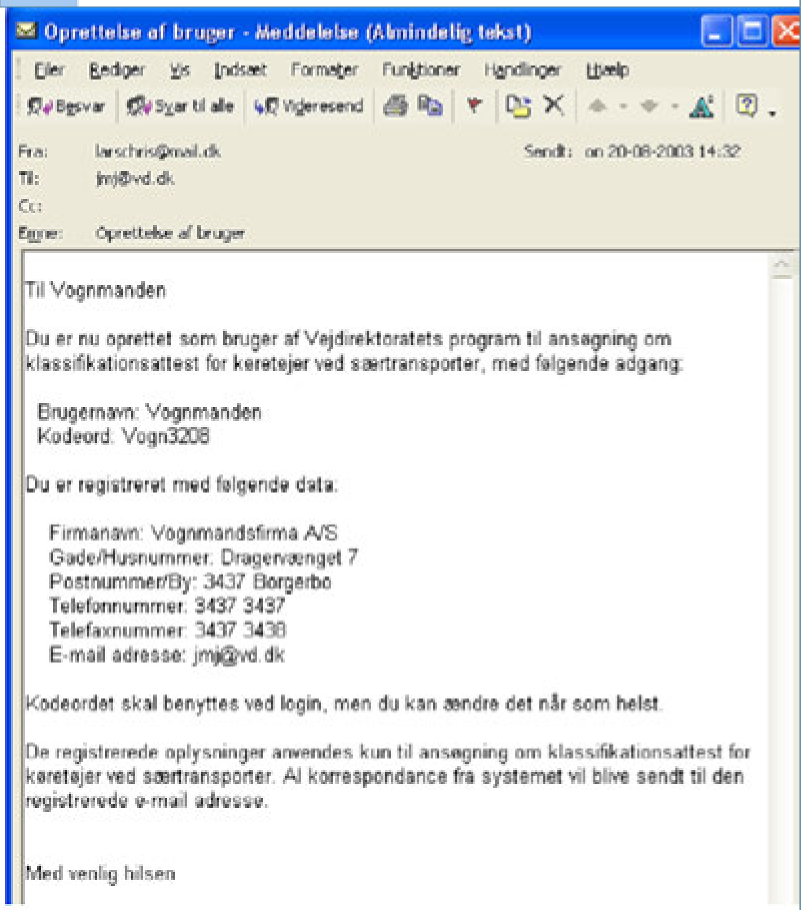
New users must register the system by opening <New user> - mask in the menu bar. New users must complete all necessary information.

The user has to indicate the e-mail address to receive information and certificate of classification, after the completed evaluation, from the system. Press <Ok> to confirm the registration.
The system will send the registered information, the user name and the password to the indicated e-mail address automatically.

An example of the conformation mail is shown in the following picture



After completing the first three masks to create a new application will appear the following mask which is indicated in the red marked <correct application> at the top of the window, as shown in the following screenshot.
The top of the mask shows all screens which have to be passed through to complete n application for classification of heavy transports by “current progress”.

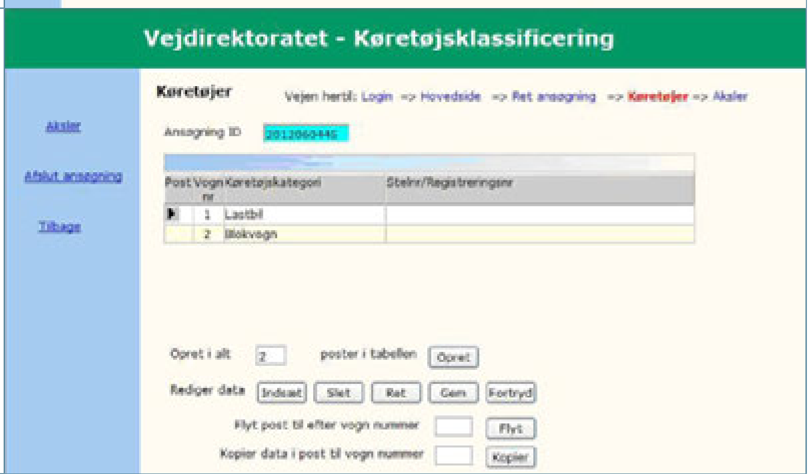


These fields must be filled in with the applicant´s information, transported maximum weight in tonnes and the maximum tire in pressure in bar or p sieve, and information of the supplier, if it´s necessary in the name of the supplier, g. in the case of a foreign haulier. When the relevant fields are completed (required fields are yellow marked), opens the next image by clicking on <vehicles> in the menu bar.

Vehicles get registered by specifying the number of records (vehicle categories) and the vehicle identification number or the number of registrations. This will be made by create total entries" in the bottom of the data schema.

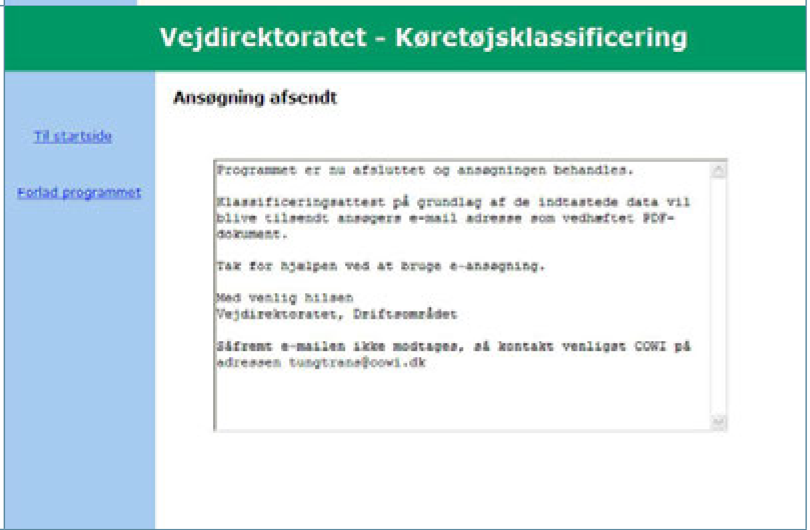
This creates the required number of free data field. For each entry, the specification of the vehicle category and also the vehicle identification number respectively the number of the vehicle registration is necessary. Alternatively, new data sets could be added by using <insertion>.

The registration of the axles shall be conducted in the same principle as shown in the screen for entering vehicle information. For each combination of axle line, axle load has to be specified in tonnes, track width in metres, the number of tires per axle line, minimum axis distance in m, the section width in mm, wheel base in m for subsequent axle line and axle suspension type. The last axle wheel base must not be indicated. Subsequently there have appear o.o.



"Exit application" means the entry is completed. Subsequently all inserted data of the applicant will be shown by an image to check the data entry before sending the application.

In case of errors it´s possible to correct the entry by clicking <edit> in the menu bar. Sending the application by clicking <send>. The application will not be send by quitting the program in a different way.

REFERENCES	
Documentation available on the project	n/a
Web link	http://danbroweb.vd.dk/webklas/webklassificering.dll/EXEC/0/C059FD0240A18AF3722DE540201809281412486O2