Directive 2010/40/EU – The ITS Directive

Initial report from NORWAY

Prepared by:

Norwegian Public Roads Administration (NPRA) in cooperation with the Ministry of Transport and Communications.

With contributions from ITS Norway and other Norwegian stakeholders

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1 Introduction

1.1 Overview

Norway has a population of app. 5 million, with around 2, 7 million cars and lorries and a road network with 95 000 km public roads. In addition, there are about 0, 8 billion trips annually with public transport. Our freight transport sector has to overcome long distances to markets, a demanding topography and mountain passes as well as adverse weather conditions especially during winter. Traditionally Norway has a strong position in maritime and short sea transport.

Building of road infrastructure has been focused on maintaining economic sustainability in coastal and rural areas, reducing the risk of exposure to adverse weather and on creating better environment in our cities. This has led to a road network with many tunnels, both in rural areas and in cities with high traffic volumes. As a consequence Norway has gained a leading competence on tunnel surveillance and safety installations as well as on electronic tolling and on the ITS systems involved. We have utilized ITS in the transport sector also for traffic safety and for information services. Norway has since long put emphasis on multimodal ITS and on interoperability.

1.2 ITS policy

Norway has a national policy for ITS which is multimodal. We have a multimodal master plan for transport with a 10 year horizon and with a revision by the parliament every 4 years. This master plan includes maritime, rail, air and road transport and covers investments, maintenance and operation as well as ITS.

The national ITS policy in more detail is described in a National Strategy for ITS issued by The Ministry of Transport and Communications. Based on this, the transport administrations for the different modes have made their own ITS Strategies. For the road sector, the current ITS action plan was adopted in 2009.

The main objectives for use of ITS are linked to the main goals of the National Transport master Plan and the National Strategy for ITS expresses how ITS can contribute to these goals:

> Optimal use of ITS can increase capacity, reliability and predictability for transport operations and reduce travel times. Transport logistics using ITS can contribute to increased profit in many business areas.
>
> Optimal use of ITS can reduce the number of severe road accidents. Intelligent infrastructure, management, surveillance and driver support can be effective safety measures that reduce frequency and consequences of unpredicted incidents.

Optimal use of ITS can increase capacity utilisation of vehicles and equipment, improve route planning and traffic flow as well as offer possibility to select the most environment friendly transport option.

Optimal use of ITS can establish access to comprehensive traffic and travel information and offer solutions for real time information of traffic and timetable deviations. Interoperable payment and ticketing systems can contribute to easier transfer between transport modes. ITS can also offer better information of available transport means for disabled people and reduce the need for assistance.

The National Strategy for ITS also focuses on challenges created by ITS, in particular on privacy, data protection and consumer rights. It also mentions the challenges related to the need for multi-stakeholder cooperation, new business models, standards and a broad international coordination.

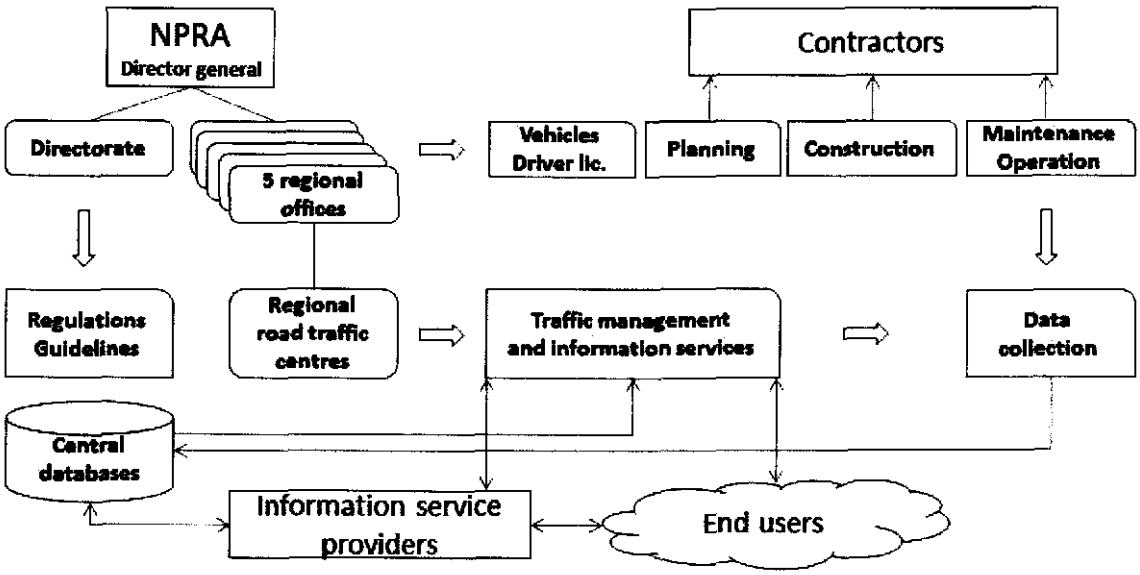
Government policy on availability of public data and on privacy have impact on ITS. These policies are in line with EU policies and represent no obstacle to implementation of the ITS Directive. Our government is currently developing a new initiative called Digital Agenda for Norway (DAN) with the goal to develop a strategy that will foster business opportunity and increased value and at the same time contribute to a sustainable and including community. Transport and ITS is expected to be included in this agenda.

1.3 Transposition of the ITS Directive

The ITS Directive is now in the pipeline to be formally incorporated EEA agreement between Norway and EU as binding legislation. We are currently also exploring the need for additional regulations in national law, to ensure full compliance to the Directive and to have legal instruments for implementation of possible new specifications in all administrative levels of the road sector.

1.4 Organisation

The road transport sector is a responsibility of the Ministry of Transport and Communications. The tasks related to road infrastructure, vehicles and driver licences are mainly delegated to the Norwegian Public Roads Administration (NPRA). This administration has the role as authority, traffic manager and national competence base and is responsible for planning, construction, maintenance and operation. Private contractors perform most of the work. Basic services for road and vehicle users are performed in-house. This applies for traffic management and traffic information. Data is made available for service providers free of charge. The following figure illustrates organisation, areas of responsibility and information flow related to road traffic.



Norwegian Public Roads Administration – tasks and information flow

2 Current status of ITS in the Road Sector

The Norwegian Public Roads Administration (NPRA) adopted in 2009 an Action Plan for use of ITS for the period 2009-2013. The plan is a follow-up and concretization of the ITS strategy adopted in 2007. The plan comprises 45 activities and actions. Implementation is under way, but somewhat limited by budgets, human resources and the need for studies and/or guidelines. The action plan is under revision to be in line with the new National Master Plan for Transport which will be proposed by the transport administrations early 2012. The basic policy behind deployment of ITS within the responsibility of NPRA is as follows:

> NPRA will actively use ITS to develop and make its responsibilities and operations more efficient. NPRA will also safeguard Norwegian interests internationally and follow up on directives and guidelines from the EU.
>
> NPRA will prepare for effective and focused use of ITS and ensure that ITS is built into relevant rules and guidelines in such a way that it becomes an integral part of the physical and digital infrastructure.
>
> NPRA can develop and operate ITS alone or in co-operation with other actors. NPRA will stimulate development of equipment, systems and services in the private sector by providing open access to quality assured data and contribute to research projects and pilots.
>
> NPRA will play an active role in ensuring data protection with regards to personal data and will seek to develop ITS services with a minimum use of personal information.

NPRA has co-responsibility for community security and preparedness in the transport sector. ITS will be used actively to manage crises and extreme situations, minimize impacts and to re-establish a normal state.

NPRA will contribute to promote Norwegian interests internationally and follow up areas which are important in relation to policy objectives of the administration and take part in relevant activities and projects connected to Nordic and international co-operation.

The measures developed and implemented will focus on achieving the objectives of the National Transport master Plan. If possible, it is important to choose well-proven solutions where experience is already made, nationally or internationally.

The actions for the period 2010 to 2013 are estimated to a cost of NOK 300 million (app. €40 Million). In addition, NPRA gives a rough estimate that around 30 person-years with an operational budget of app. NOK 80 million (€10 million) are dedicated to ITS related tasks within the administration. In addition to this, resources are used for ITS in county administrations and in municipalities as well as in the other transport modes.

The more detailed status of ITS in the road transport sector will be reported under each of the four priority areas.

2.1 National ITS Advisory Board

The Ministry of Transport and Communications has asked NPRA to establish and manage a national ITS advisory board. The board will be convened for the first meeting in September 2011. The mandate or terms of reference indicates that it will be running through 2017. The purpose and objectives of the board is partly in line with the ITS Advisory Group on European level. The board will have 14 regular members and has 3 extra seats for temporary participants. Members are organisations representing public administrations, users, industry and research/education. It will be chaired by the Director General of NPRA.

2.2 Research Activity on ITS

The Ministry of Transport and Communications finances one research program for ITS managed by the Research Council for Norway. It is called SMARTRANS. The purpose is to create smarter, more economical and efficient transport solutions for freight inn all modes. The program also aims to stimulate intermodality, efficient terminal operation and the use of ITS. In addition, the program VERDIKT which intends to develop solutions to generate value and profit in all parts of business, is supporting projects that includes ITS.

SINTEF has a strong position nationally and internationally as a research institute with advanced competence and a portfolio of ITS related projects. The institute has a close relation to Norwegian University of Science and Technology (NTNU).

The Institute for Transport Economics (TØI) has a high competence in road traffic safety, on evaluations and on effects of ITS solutions.

2.3 National Test Site for ITS

Test Site Norway is a field operational test-bed facility for ITS in the city of Trondheim with advanced communication, sensor and monitoring infrastructure on full scale stretches of roads. One section of the test site is equipped with technology from the CVIS-project enabling testing of Cooperative Systems. The test site also includes an advanced vehicle simulator. This test site is established and operated in cooperation between the Norwegian University of Science and Technology (NTNU), SINTEF, NPRA and Q-Free ASA. It is open for national and international projects and companies to test new application and equipment.

2.4 National ITS Association

ITS Norway is the national ITS organisation for Norway partly funded by the government with an annual grant through the national budget. The association is a public-private platform for cooperation with app. 70 member entities. ITS Norway works to promote ITS for all modes and to create awareness and more ambitious policies for ITS. They also have activities to build competence, initiate research and stimulate business opportunity from ITS. ITS Norway is a member of ITS nationals and is an active player on the international ITS arena

2.5 National Multimodal Cooperation

The four main transport modes share the same challenges and have access to the same new technologies when it comes to safety, traffic management and information systems for users. The transport infrastructures are very different, but agreed principles and the legal basis have important similarities. These facts offer a potential for synergy and beneficial cooperation. Cooperation activities on ITS have been on-going since 1998. This cooperation has initiated the development of ARKTRANS and the establishing ITS Norway as a multimodal organisation.

The National Rail Administrations is active in ITS development. They have services and projects for traffic and travel information and traffic management. The administration is involved in international harmonisation work and are are currently working on their strategy and action plan for ITS in rail transport. Implementation of ERTMS will be an important part of this plan.

The Norwegian Coastal Administration is also active in the field of ITS and is a leading participant in several national and international projects, like Safe Sea Net and Motorways of the Sea. They are active in IMO, IALA and PIANC.

The air traffic and airport administration Avinor is an active participant in the international pprojects to develop better air traffic management. Key words are Single European Sky and SESAR.

2.6 International Participation

The Ministry of Transport and Communications is represented in the ITS Committee (EIC). The City of Oslo is a member of EuroCities and participates in the Urban ITS expert group. The City of Trondheim is member of POLIS. Trafikanten (the public transport information center) is a member of UITP and participates in the Urban ITS expert group. NPRA participates in CEN TC278, Easyway (VIKING) and is a member of CEDR. NPRA is a also member of ERTICO together with SINTEF and Q-Free. In addition to this, ministries, administrations and companies are participating on several international forums also in the research area.

3 Contact persons in relevant organisations

Name	Type	Contact person	e-mail address	Telephone
Ministry of Transport and Communication	Ministry	Anders Martin Fon	anders-martin.fon@sd.dep.no	+47 909 26 758
Norwegian public roads administration (NPRA)	National authority	Ivar Christiansen Eirik Skjetne	ivar.christiansen@vegvesen.no eirik.skjetne@vegvesen.no	+47 900 43 195 +47 930 58 630
Urban Environment Agency - City of Oslo	Municipal	Helge Jensen	helge.jensen@bym.oslo.kommune.no	+47 977 21 942
ITS Norway	National ITS association	Trond Hovland	trond.hovland@its-norway.no	+47 907 60 831
Trafikanten	Public Transport Information Center	Jarl Eliassen	jarl.eliassen@trafikanten.no	+47 901 40 990
The research Council of Norway		Øystein Strandlie	ost@forskningsradet.no	+47 900 51 144
SINTEF	Independent research concern that possesses expertise in technology, medicine and the social sciences	Per Johan Lillestøl	per.lillestol@sintef.no	+47 926 19 400
TØI	Independent research institution for transport and development	Lasse Fridstrøm	lef@toi.no	+47 416 11 402
NTNU	Norwegian University of Science and Technology	Arvid Aakre	arvid.aakre@ntnu.no	+47 926 19 418

4 Priority area I – optimal use of road, traffic and travel data

Priority area I: Optimal use of road, traffic and travel data			
Activities or projects concerned with the optimal use of road, traffic and travel data	X Implemented	☐ Planned	☐ Not planned
Responsible person in administration	*Mr Ivar Christiansen* *Director, Traffic management Section, NPRA* *ivar.christiansen@vegvesen.no, +47 900 43 195*		
Comments			
If activities/projects are implemented or planned in this priority area, please specify further:			
Multimodal travel information services	X Implemented	☐ Planned	☐ Not planned
	Public multimodal web service and travel planning with national coverage integrated between road transport and public transport in test. Scheduled for release end of 2011		
Real-time travel information services	X Implemented	☐ Planned	☐ Not planned
	Real-time information for PT available in Oslo and some other cities Real-time travel time information for road traffic under establishment in 4 largest cities		
Availability of road, traffic and transport services data used for digital maps	X Implemented	☐ Planned	☐ Not planned
	Regular service for service providers as cooperation between national mapping authority and NPRA		
Road safety related traffic information provided free of charge	X Implemented	☐ Planned	☐ Not planned
	National broadcaster Nrk distributes RDS-TMS and RDS TA messages free of charge. Also web service from NPRA for road and traffic messages free of charge		
Public transport travel data	☐ Implemented	X Planned	☐ Not planned
	Central data base with public transport route and stop data with national coverage in planning. Responsible authority is NPRA		
Road weather data and prognosis	X Implemented		
	Enhanced system (vegVær) under implementation giving road operators detailed prognosis for road weather and better information quality to road users		
Datex node	☐ Implemented	X Planned	☐ Not planned
	Datex II node is under construction. Will include all real time data for road traffic. Responsible: NPRA		

5 Priority area II – Continuity of traffic and freight management ITS services

Priority area II: Continuity of traffic and freight management ITS services			
Activities or projects concerned with continuity of traffic and freight management ITS services	X Implemented	☐ Planned	☐ Not planned
Responsible person in administration	*Mr Ivar Christiansen* *Director, Traffic management Section, NPRA* *ivar.christiansen@vegvesen.no, +47 900 43 195*		
Comments			
If activities/projects are implemented or planned in this priority area, please specify further:			
ITS Framework architecture	X Implemented	☐ Planned	☐ Not planned
	ARKTRANS is the official ITS framework architecture for Norway. Explained further in separate box below		
Management of passenger transport across different modes	X Implemented	X Planned	☐ Not planned
	National multimodal master plan for transport secures top-level coordination, but operational management is on the agenda and will be enhanced in near future. Presently it is close cooperation between traffic management centers, but no regular coordination.		
Management of freight along transport corridors	X Implemented	☐ Planned	☐ Not planned
	Restricted to company based services for operators. Research projects and pilots is running.		
Tracking and tracing of freight across all modes of transport (freight transport logistics, eFreight)	☐ Implemented	X Planned	☐ Not planned
	Norway has had participation in the establishment of eFreight. We will contribute to standardized services in this field, where ARKTRANS may be an instrument for progress.		
Urban ITS architecture	☐ Implemented	X Planned	☐ Not planned
	No concrete plans yet, but ideas are worked on, mainly in the Oslo-area.		
Road traffic management centers	X Implemented	☐ Planned	☐ Not planned
	Five regional traffic management centers are operational since 1992		
Electronic ticketing for public transport	X Implemented	☐ Planned	☐ Not planned
	National guidelines have been implemented in the regulatory statues. These are presently functioning as a de facto national standard.		

ITS framework architecture

Norway has an official ITS framework architecture called ARKTRANS. It is multimodal in the sense that it is generic; independent of transport mode. We have found that ARKTRANS is a valuable tool to create the necessary understanding, to give common terminology and serve as common chart for defining roles, responsibilities and business models between different stakeholders. ARKTRANS also harmonises freight and passenger transport which to a large extent is performed by the same types of transport means, on the same transportation networks, and a freight item and a travelling person are quite equal from a conceptual point of view.

An alternative approach is to establish separate architectures for each transport mode and define interfaces between them. Such an approach will complicate the establishment of optimal intermodal solutions. Empirically, interfaces or gateways for such complex solutions will require a lot of effort, and they may also cause problems due to differences in semantics. By establishing common multimodal framework architecture, ITS solutions that support intermodal transport are more likely to be established. System interoperability, efficient information flows, coordination across transport modes, etc. can be supported by common concepts and specifications that bridge the current gaps in semantics and arrange for interoperability and efficiency.

ARKTRANS is framework architecture. The intention is to support requirement specifications and system architectures for ITS through the provision of generic specifications of transport solutions by "hiding" irrelevant details when they are not needed

ARKTRANS has been utilised and further developed in European research projects and is the basis for the eFreight architecture. We see ARKTRANS a promising platform for developing the EU ITS Framework Architecture (priority area II, item 1.1). It is complementary to KAREN/FRAME, the ITS architecture for road transport, but harmonisation work is needed.

See **www.arktrans.no**

6 Priority area III – ITS Road safety and security application

Priority area III: ITS road safety and security applications			
Activities or projects concerned with ITS road safety and security applications	X Implemented	☐ Planned	☐ Not planned
Responsible person in administration	*Mr Ivar Christiansen* *Director, Traffic management Section, NPRA* *ivar.christiansen@vegvesen.no, +47 900 43 195*		
Comments			
Automatic emergency call (eCall)	☐ Implemented	X Planned	☐ Not planned
	Norway has signed MoU, participates in standardization (CEN TC278) and will start planning of organizational structures, PSAPs etc.		
Information services for safe and secure parking places for trucks and commercial vehicles	☐ Implemented	☐ Planned	X Not planned
Information services for safe and secure parking places for trucks and commercial vehicles	☐ Implemented	☐ Planned	X Not planned
	If implemented or planned please specify further using Template 5		
Safety of road users with respect to their on-board HMI	☐ Implemented	☐ Planned	X Not planned
	If implemented or planned please specify further using Template 5		
Nomadic devices to support driving task and/or the transport operation	☐ Implemented	☐ Planned	X Not planned
	If implemented or planned please specify further using Template 5		
Security of in-vehicle communications	☐ Implemented	☐ Planned	X Not planned
	If implemented or planned please specify further using Template 5		
Safety and comfort of vulnerable road users	☐ Implemented	X Planned	☐ Not planned
	The national Transport Plan has ambitious goals for bicycle, pedestrian and other vulnerable road users. There is a main goal to use Universal Design principles both for infrastructures and for ITS services.		
Advanced driver assistance systems integrated into vehicles and road infrastructure	X Implemented	☐ Planned	☐ Not planned
	Some projects using ISA, alco-lock and "black-box" monitoring of driver behavior. ISA and alco-lock is mandatory in all vehicles owned by NPRA.		
Automatic speed enforcement	X Implemented	☐ Planned	☐ Not planned
	Regular speed cameras and average speed enforcement with fully digital solution is operational		

Automatic incident detection	X Implemented	☐ Planned	☐ Not planned
	Implemented in high volume road tunnels in combination with video monitoring		

7 Priority area IV – Linking the vehicle with the transport infrastructure

Priority area IV: Linking the vehicle with the transport infrastructure			
Activities or projects concerned with linking the vehicle with the transport infrastructure	X Implemented	☐ Planned	☐ Not planned
Responsible person in administration	*Mr Eirik Skjetne* *Director, ITS Section, NPRA* *eirik.skjetne@vegvesen.no, +47 930 58 630*		
Comments			
If activities/projects are implemented or planned in this priority area, please specify further:			
Integration of different ITS in an open in-vehicle platform	☐ Implemented	X Planned	☐ Not planned
	Test Site Norway in Trondheim is equipped for testing of such communication platforms		
Cooperative systems (vehicle-vehicle, vehicle-infrastructure, infrastructure-infrastructure)	☐ Implemented	X Planned	☐ Not planned
	Tests run in the SMARTFREIGHT and CVIS projects.		
DSRC-based multi-purpose infrastructure	X Implemented	☐ Planned	☐ Not planned
	The AutoPASS tolling system is fully interoperable, also cross-border. Tags are used to measure travel times in real-time. Other piggy-back applications are under discussion		
Test site for ITS and cooperative driving	X Implemented	☐ Planned	☐ Not planned
	National full scale test site equipped for cooperative mobility systems including simulator operational in Trondheim		
Access to road traffic data in DATEX II format	X Implemented		
	Open web-service by NPRA is under constrction. Will include traffic data, road-weather data, video cameras, traffic messages and, road network data and a route calculator		