

Directive 2010/40/EU  
Progress Report 2017  
*Sweden*

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2017-10-10

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## 1 Introduction

### 1.1 General overview of the national activities and projects

According to Article 17 of Directive 2010/40/EU on the framework for the deployment of Intelligent Transport Systems in the field of road transport and for interfaces with other modes of transport (the Directive), following the initial report submitted in 2011 by Member States on their national activities and projects regarding priority areas, Member States shall report every three years on the progress made in the deployment of the actions referred to in paragraph 1 of the Directive.

This Report on national activities and projects in Sweden covers the period from 2014 to the present. The Report is organized according to the Directive's Priority Areas and Actions as defined in Article 2, Priority areas, and Article 3, Priority actions.

### 1.2 General Progress since 2014

#### 1.2.1 Progress on Priority Areas since 2014

Sweden is a geographically large country, extending almost 1,600 kilometres from north to south. Its main population centres are in the southern one-third of the country, but its extensive natural resources are spread throughout its entire land area, including in the far north above the Arctic Circle. Safe, secure and effective road transport is vital to Sweden's viability and sustainability. Significant progress has been made in all Priority Areas since 2014.

#### *Optimal use of road, traffic and travel data*

The availability of multimodal data is steadily improving due to the rapid expansion of Smartphone applications. The public transport sector has collaborated around a joint project to open up more data and worked on the standardized provision of data.

The National Open Data Platform, a portal for public authorities (<https://oppnadata.se/>) is further developed and continues to stimulate public authorities to publish open-data according to common guidelines.

The Swedish Transport Administration, City of Gothenburg and City of Malmö have procured travel time data, in order to initially supplement and eventually replace traditional traffic measurements obtained from in-road and roadside sensor systems.

The development of the API and quality of data in the National Access Point is steadily improving.

#### *Continuity of traffic and freight management services*

A solution for exchange of information between different company-specific clouds has been developed in co-operation between the Swedish Transport Administration and the Swedish transport industry. This cloud solution for information exchange makes it possible to address specific vehicles and create cost-effective opportunities for various security applications.

#### *Road safety and security applications*

Sweden continues to expand with Automatic Traffic Safety Control (*ATK - Automatisktrafiksäkerhetskontroll*) on not lane separated major roads.

The Swedish automotive industry, is working intensively on developing support systems for improved road safety, including *Pedestrian Detection, Blind Spot Information, Auto brake, Lane detection, Hazard location warning* etc. in cooperation with The Swedish Transport Administration.

#### *Linking the vehicle with the transport infrastructure*

The Swedish Transport Administrations as a road operator is establishing a project for improvement of external data reception, such as mobile- and vehicle probe data, into its own systems. Sweden has implemented several projects to evaluate the possibilities and benefits of exchanging information from traffic signals, including from vehicles to traffic signals. There are plans to implement additional projects in this area.

#### **1.2.2 Major ITS Projects**

**OPEN DATA** The Swedish Government initiated the establishment of a National Open Data Platform for data from public authorities' The platform is maintained and further developed by the Swedish National Archives, (SNA) and the assignment means that the SNA shall collect and publish information from public authorities according to the PSI-directive and stimulate public authorities to publish open data according to common guidelines. The platform objective is, be simple to use, have clear licensing terms and conditions, support re-use of data and enable sharing of resources and solutions. The European data portal harvests metadata from this Swedish national open data platform. The metadata format used by the platform is DCAT-AP, a format recommended by the EU Commission for data portals.

**Nordic Way** The NordicWay project has developed an information exchange solution for different enterprise-specific clouds. Through this cloud solution it is possible to address specific vehicles, and creating cost-effective opportunities for different security applications. In the longer term, there are also new opportunities for organizing traffic. The project is financed by EU CEF and in it's phase 2 it will be part of the C-Roads Platform an one of it's corridor projects

**BADA (Big Automotive Data Analytics)** This Swedish project with a budget of 30 million SEK, focuses on exchanging transport-related data between different actors (e.g., vehicle OEMs, public authorities, service providers, etc.) and the possibilities and challenges with big data

analytics. The project also studies the various roles of players in the eco-system, business models etc. Participating members are Volvo Cars Company, Volvo Group, Scania, Swedish Institute of Computer Science and the Swedish Transport Administration. The results from the BADA project will be providing the basic building blocks necessary to take the next step in the development of Big Data Analytics in the automotive and transport area.

*Drive ME* is the world's first large-scale pilot project in autonomous driving where self driving Volvo cars will be driven on public roads in Gothenburg. The project is a joint initiative of Volvo Car Group, the Swedish Transport Administration, Swedish Transport Agency, Lindholmen Science Park and the City of Gothenburg. DriveMe is supported by the Swedish Government. The purpose of the project is to study the social benefits of autonomous driving and the use of autonomous cars for sustainable mobility. The project has started in 2014 with customer surveys, development of the technology, user interface and cloud services. The first pilot cars will roll out on Gothenburg roads in 2017.

*Autofreight* (Highly Automated Freight Transports) will conduct research on core commercial vehicle technologies and infrastructure needs to develop automated road freight transports on highways with full machine driving responsibilities (SAE Automation level 4). The project will operate on Asta zero test track as well as the road between Gothenburg Harbour and the logistic Hub in Viared, Borås.

Partners in the project are Volvo Group, Chalmers University, Combitech, The city of Borås, GDL Transport, Ellos Group, Swedish transport administration, Kerry Logistics, and Speed group. The project will continue between 2017- 2020 and has a budget of more than 50 million kronor

### **1.3 Contact information**

The Member state representatives in EU ITS-Committee are:

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[maria.marton@transportstyrelsen.se](mailto:maria.marton@transportstyrelsen.se)

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## 2 Projects, activities and initiatives

### 2.1 Priority Area I: *Optimal use of road, traffic and travel data*

The Swedish Transport Administration has developed several alternative methods to provide access to traffic and travel data for road and rail. Interfaces are available for both private individuals and companies to preview and obtain copies of data from the Administration and other authorities. These data are provided free of charge with a minimum set of requirements for using the data. In various national projects, pilots and demonstration activities, the Swedish Transport Administration has together with a group of stakeholders elaborated the legal, technical and business opportunities for exchanging data among all parties. The stakeholder group gathered Sweden's vehicle manufacturing companies, suppliers, transport solutions providers, IT consultancies and the telecom industry.

The following activities are the most significant in the area road, traffic and travel data:

- The National Access Point for public transport travel data has been in operation since 2011 as a consequence of new Regulations for Public Transport. According to these regulations, static data have to be sent to a database, operated and managed by *Samtrafiken AB*. (*Samtrafiken AB is a service development company in the public transport sector which was established in 1993 and owned by 37 different operators.*)
- The public transport sector has actively participated on a regular basis in different hackathons and arranges working meetings with transit service providers three-to-four times a year.
- From the regional access points in Stockholm, Gothenburg and Malmö, it is possible to obtain some real-time information for public transport.
- Information on data pricing is highly desired by service providers who wish to develop ticketing functionality in addition to their other transport information services. A national project has this autumn looked into the topic.
- Public authorities continue to review the possibilities of purchasing vehicle 'probe data' from the automotive and trucking fleet operators.

### 2.1.1 Description of the national activities and projects

Project/activities	Description
API for dynamic road data	<p>The Swedish Transport Administration has developed a new API for road traffic information for the main Swedish road network. The API has been available since 2016 and is a complement to other national data access points for the real-time data that use the DATEX II standard. As of September 2017, data about safe and secure parking is also available from the new API.</p> <p>Project duration: 2015-2016</p> <p>Costs: 1 Million SEK And approx. 2 Million SEK/yearly maintenance costs.</p>
API for dynamic rail-data.	<p>An API service for real-time train traffic information) from passenger trains has been developed and released in 2014. From this API it is possible to obtain train timetable data and interchanges. There is an ongoing work to use DCAT-AP standard for all open data.</p> <p>Project duration: 2013-2014</p> <p>Costs: 1.5 Million SEK and approx. 2 Million SEK/yearly maintenance costs.</p>
DATEX II & RDS-TMC for dynamic road data	<p>From 1990, It has it been possible to get dynamic road data via RDS-TMC. Since 2000, there is a DATEX interface for service providers. The users of the DATEX interface are often larger and more established companies.</p> <p>Project duration: 2001-</p> <p>Costs: 3.7 Million SEK per year for DATEX and 1, 3 Million SEK for RDS-TMC</p>
API for static road and rail data	<p>This API provides Swedish road and rail data available for both private persons and companies. One example of an area of use is creating travel planners for cyclists.</p> <p>Project duration:2002-</p> <p>Costs: 1 Million SEK/yearly maintenance costs.</p>
National project about open traffic data focus on public transport actors	<p>Joint Forces for Open Traffic Data is an industry-wide initiative established and funded in Sweden in 2016.</p> <p>Project duration:2016-2017</p> <p>Costs: 1 Million SEK</p> <p>Implementation: 2018-2020</p> <p>Costs:25 Million SEK</p>



<p>Project on common ticket and payment solutions</p>	<p>The objective of the project was to make ticketing easier for travellers and transport companies. The project has developed standards and interfaces that are prerequisites for ticketing. Stakeholders in the public transport sector collaborated in this project.</p> <p>Project duration:(2014-2016) Costs:20 Million SEK</p>
<p>National portal for open data (opnadata.se)</p>	<p>The Swedish Government initiated development of a national open data platform for public authorities' data. The objective with the platform is to be simple to use, have clear licensing terms and conditions, support re-use of data and enable sharing of resources and solutions. The European data portal harvests metadata from this Swedish national open data platform. The metadata format used by the platform is DCAT-AP, a format recommended by the EU Commission for data portals.</p> <p>Project duration: 2016 Costs: 1.4 Million SEK/yearly maintenance costs.</p>
<p>BADA (Big Automotive Data Analytics)</p>	<p>The project focuses on exchanging transport-related data between different actors (e.g., vehicle OEMs, public authorities, service providers, etc.) and the possibilities and challenges with big data analytics. The project also studies the various roles of players in the eco-system, business models etc. Participating members are Volvo Cars Company, Volvo Group, Scania, and the Swedish Institute of Computer Science and the Swedish Transport Administration. The results from the BADA project will provide basic building blocks necessary for the next step in the development of Big Data Analytics in the automotive and transport area.</p> <p>Project duration: 2015-2017 Costs: 30 Million SEK</p>
<p>EU EIP (European ITS Platform)</p>	<p>Sweden participates in EU EIP, through the Swedish Transport Administration, as a member and follows the work in the sub-activity "Determining Quality of European ITS Services". The scope of this sub-activity is the development of quality requirements and quality assessment practices for all ITS Directive priority services involving the road authorities and operators.</p> <p>Project Duration: 2016-2020 Costs: 100 000 SEK per year</p>

TISA (Travel Information Service Association)	<p>The Swedish Transport Administration is participating in the TISA work on open Traffic and Traveller Information (TTI) standards and policies and the implementation of traffic and travel information services and products based on existing standards, including primarily RDS-TMC and TPEG technologies. The Administration is directly involved in three working groups: 1) ITS Directive; 2) public authorities; and, 3) business cases.</p> <p>Project Duration:2007- Costs:100 000 SEK per year</p>
RSI (Road Status Information)	<p>In this project were 200 cars equipped with a system called Road Status Information. This system foresees and describes where and when the slippery road occurs warns the driver of a slippery road. The cars collect anonymous data and combine it with weather data from other sources and delivers the slippery road condition information in real-time to the driver. The information could also be shared to other vehicles and drivers.</p> <p>Project Duration: Winter 2016/2017 Costs: 6.6 Million SEK Implementation: 2018-2021 Costs: 17.0 Million SEK</p>
Traffic signals	<p>The vehicle industry; manufacturers, suppliers and service providers, have expressed their interest in traffic signal data from authorities and municipalities.</p> <p>Several Swedish cities have previously conducted local projects to exchange data from traffic signals to vehicles and from vehicles to traffic signals. The Swedish Transport Administration has an ongoing dialogue with national and local road operators and the vehicle industry to evaluate, test and develop solutions for exchanging data from and to vehicles and traffic signals. There are plans for a project with more comprehensive approach to traffic signal communication. The ambition is to clarify how a possible broad implementation could be carried out.</p> <p>Project Duration: 2016-2019 Costs: 800 000 SEK</p>

### 2.1.2 Progress since 2014

See Section 1.2.1 General progress.

### **2.1.3 Reporting obligation under Delegated Regulation (EU) 2015/962 on the provision of EU-wide real-time traffic information services (priority action b)**

The Swedish Access Point has been developed in accordance with the delegated regulation, Act b <http://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX%3A32015R0962> and has been operational since 8 May 2017 (see [www.trafficdata.se](http://www.trafficdata.se)). The Access Point includes:

- Discovery services for users.
- Possibility to publish and search datasets.
- Possibility to publish datasets for the entire transport network in Sweden.
- Support service.

Almost all Swedish motorways are included in the comprehensive trans-European road network. No priority zones are so far identified in Sweden.

The Swedish Transport Administration has organized two workshops with users of the new Traffic Portal ([trafficdata.se](http://www.trafficdata.se)). The first workshop in October 2016 focused on information about the ITS Directive and on user requirements on the Portal... At the second workshop in the beginning of May 2017 were the Portal functionalities demonstrated and the participants had the opportunity to test the Portal in live operation. Representatives from the private sector (e.g. TomTom, HERE, and Mediamobile), cities and public authorities participated in the event.

### **2.1.4 Reporting obligation under Delegated Regulation (EU) No 886/2013 on data and procedures for the provision, where possible, of road safety-related minimum universal traffic information free of charge to users (priority action c)**

*(see guidance provided in Member States experts follow up meetings)*

Progress made in implementing the information service, including the criteria used to define its level of quality and the means used to monitor its quality:

The identification of the road network and where the service will be provided has been decided. It will cover the whole TERN state road network in Sweden. Organizations interested in the exchange and reuse of data can find information about available services at the National Access Point. There are links to organizations that deliver data and the transport network their delivery covers. More information is available at the following web link: <http://www.trafikverket.se/en/startpage/Operations/Operations-road/Traffic-information/Real-time-traffic-information/>.

Results of the assessment of compliance with the requirements set out in Articles 3 to 8 of Delegated Regulation (EU) No 886/2013:

The Swedish Transport Administration has provided the following declaration of Compliance with Article 9.2:

- The Swedish Transport Administration covers all safety-related categories, except for in Article 3 stated (g) “unmanaged blockage of a road”. On the TERN road network The Swedish Transport Administration covers the state road network.
- The DATEX2-delivery access point, found at the Swedish Transport Administrations web-site ([www.Trafikverket.se](http://www.Trafikverket.se))
- DATEX2 and also an easy to use API/XML
- TMC and Swedish Transport Administration Web-Slite “Läget i Trafiken”

Sweden uses the template created in the EU EIP project for declaration of compliance. But there are still steps to be taken so that all service providers use the template and reports to the independent body, the Swedish Transport Agency. See additional information below.

Where relevant, a description of changes to the national access point:

The National Point of Access (NPA) is up and running since 2015-10-15.

<http://www.trafikverket.se/en/startpage/operations/ITS/spa--data-on-the-road-transport-system/>

Additional information:

On 8 May 2017 the Swedish Transport administration launched the Swedish National Access Point (NPA) Trafficdata.se for priority actions B (real-time traffic information), action C (safety related traffic information) and action E (truck parking information), and with possibility to include data from the delegated act a (EU-wide multimodal travel information services). The National Access Point was launched during a combined information and “try out” meeting with future users of Trafficdata.se, including private service providers such as TomTom, HERE and Mediamobile. One of the objectives of the meeting was to show the advantages of being part of the community and to make the information service providers familiar with the updating procedures for their information in the portal. In addition the harmonized “self declaration” was presented by The Swedish Transport Agency.

A description of dataset from Swedish Transport administration and Mediamobile (priority action c) is available at the Swedish National Access Point (NPA) Trafficdata.se. Traffic information from the road network in city of Stockholm and Gothenburg are included in the Swedish Transport administration delivery through an agreement between the parties.

## 2.2 Priority Area II: Continuity of traffic and freight management ITS services

Description of the relevant initiatives, their objective, timescale, milestones, resources, lead stakeholder(s) and status.

The majority of traffic and freight management implementations of new technology can be attributed to the ITS - area. Digitization also of the transport system creates new opportunities in traditional road management. The Swedish Transport Administration strategy to combine and include new digital ITS solutions in traditional road transport processes such as planning, maintenance and investment.

### 2.2.1 Description of the national activities and project

Project/activities	Description
Traffic Management System (NTS)	<p>The Swedish Transport Administration in cooperation with Norwegian Road Administration developing a new Traffic Management System (NTS). The main purpose is to modernize the traffic management and information system for road traffic management in their respective countries.</p> <p>Duration of project:2018-2019 Costs: 135 Million SEK</p>
DTLF (Digital Transport Logistic Forum)	<p>Sweden is participating in the work with the Digital Transport and Logistic Forum via The Swedish Transport Administration, Swedish Maritime Administration and several other Swedish partners (e.g. Ericsson and Chalmers).</p> <p>The DTLF forum aims to improve the capability between various stakeholders of using digitalisation as an enabler for efficient and seamless transport within the field of freight.</p> <p>Duration of project: 2016-2018 Costs: 1.8 Million SEK</p>
HCT (High Capacity Transport)	<p>The main freight initiative in Sweden is High Capacity Transport (HCT), which also holds components with ITS relevance, such as access management. In HCT, higher total loads will be allowed on parts of the network while axle loads will be unchanged.</p> <p>Project of project:2016-2020 Costs: 50 Million SEK</p>
NEXT-ITS, NordicWay II and European ITS platform (EU EIP).	<p>Freight issues are also addressed in the corridor cooperation project (NEXT-ITS) and the European ITS platform (EU EIP).</p> <p>The Swedish Transport Administration</p>

	<p>coordinates a work item in NEXT-ITS, participates actively in the EU EIP expert group and in the ITS deployment cooperation on northern part of Scan-Med corridor. In the upcoming phase of the NordicWay II project there is also a more dedicated freight initiative. Hybrid technology and results from NordicWay1 will be used to improve ring road logistics.</p> <p>Project duration: 2016-2020 Costs:7-8 Million SEK per year</p>
<p>Mobility-as-a-Service (MaaS)</p>	<p>The Governmental Innovation partnership program for Next generation travel and transport has developed a roadmap for MaaS in Sweden. The roadmap identifies areas and activities that are important for reaching the goals set out in the roadmap, among others – reaching a point where shared mobility will be the norm over single occupied vehicles.</p> <p>To be able to maintain and develop this roadmap, and also contribute in the coordination of different activities in this area, the Swedish Government’s Collaboration Group for Next Generation Travel and Transport also initiated the KOMPIS project (Combined Mobility as a Service, up-scaling in Sweden). This includes supportive financing for the digitalisation of public transport tickets, identifying legislative and institutional barriers, evaluation and also financing for pilots and expansion of mobility services.</p> <p>Project duration:2016-2020 Costs: 20-25 Million SEK</p>
<p>Drive Sweden</p>	<p>Drive Sweden is a Strategic Innovation Program launched by the Swedish government that gathers the best in the area – from all sectors of society. The challenges tackled along the way could pertain to road safety, adaptation of infrastructure and legislation that needs updating.</p> <p>Partners in the program, e.g. Ericsson, Swedish Transport administration, Scania, Volvo Cars Company, Volvo Trucks. In total, Drive Sweden has more than 40 partners.</p> <p>Drive Sweden establishes an open environment for developing cloud services, and that data access and data exchange can be done efficiently, as well as creating data exchange capabilities through open APIs and a library of interfaces and the ability to store data in the cloud.</p> <p>Project duration: 2015 - 2025 Costs: 20 Million SEK per year</p>

FFI (Strategic Vehicle Research and Innovation)	<p>The Swedish Government and industry are investing in a long-term partnership within FFI (<i>Fordonsstrategisk, Forskning och Innovation/ Strategic Vehicle Research and Innovation.</i>) FFI funds R&amp;D that focuses on energy, environment, safety and automation. The effort is ongoing and includes 90 million Euro per year, half of it comes from public funds through VINNOVA, Swedish Transport Administration and the Swedish Energy Agency. An equivalent amount is invested by the four industrial partners: Volvo Trucks, FKG (Scandinavian Automotive Suppliers), Scania and Volvo Cars Comany.</p> <p>Project duration: 2016- Costs: Approx. 900 Million SEK per year</p>
Sub-urban logistics – more efficient use of infrastructure	<p>A pre-study (2015- 2016) showed that existing roads could be used in a better way by letting certain types of goods traffic have access to priority lanes. With vehicles that are linked to the net, traffic could be guided into specific traffic lanes depending on the traffic situation and if the vehicle meets certain requirements. The follow-up project (2016 - 2018), involves deeper analysis of the results that emerged from the pre-study from the perspective of feasibility and sustainability, as well as verifying the environmental and business benefits of more efficient approach and bypass logistics. The project's next stage also includes investigation of the practical possibilities of implementing a full-scale demonstration of the proposals for the solutions that were identified in the pre-study.</p> <p>The partners are the following: DB Schenker, CLOSER, Chalmers University of Technology, The Royal Institute of Technology Stockholm, the Swedish Transport Administration, Västra Götaland Region, the City of Gothenburg and Stockholm and Mindconnect.</p> <p>Project duration: 2016 - 2018 Costs: Approx. 3,75 Million SEK</p>
SWIFTLY Green	<p>SWIFTLY Green (Sweden-Italy Freight Transport and Logistics Green Corridor) was a European project coordinated by CLOSER/Lindholmen Science Park aiming to develop a toolbox for green corridors (TEN-T). The result was among other things a toolbox that consisted of guidelines, tools and recommendations for greening of logistics and transport. It will be based on best practice and transferable results from a thorough mapping and analysis of previous and on-going projects. A special sub-project was dedicated to ITS measures.</p>

	<p>The main partners in the project were Swedish Transport Administration, Procter &amp; Gamble, Port of Trelleborg, BBT SE, Interporto Bologna, Danish Transport Authority, Hamburg Hafen Marketing, Bremen, Tiroler Landesregierung, Temrinali Italia, TU Berlin, NTM.</p> <p>Project duration: 2013 - 2015 Costs: Approx. 28 Million SEK per year</p>
Digitalization of transport chains	<p>Digitalization of freight transport chains aims to streamline freight transport by digitizing the transport chains to increase transparency, enabling the buyer to see how the goods are transported. This in turn gives the buyer the opportunity to choose the most transported goods. Digitization, and the transparency that it enables, is a key to sustainable transport. When transport buyers and consumers understand how a product has been produced and transported, their choices can influence sustainable, efficient and traffic-safe transportation. Transparency enables industry-leading players to show buyers that they are actively working to use the most efficient modes of transport, environmentally friendly vehicles and sustainable social conditions for the people who work in the distribution.</p> <p>Partners; Lund Technical University. Project duration: 2017 Costs: Approx. 2,75 Million SEK</p>

### 2.2.2 Progress since 2014

See Section 1.2.1 General progress.



## 2.3 Priority Area III: ITS road safety and security applications

Description of the relevant initiatives, their objective, timescale, milestones, resources, lead stakeholder(s) and status:

The Swedish Transport Administration investigates, in several projects, how ITS solutions can improve road safety at roadworks. Implementation of delegated act e (safe and secure truck parking) is ongoing and proceeds according to plan. The Swedish state owned rest areas for the delegated act e is also published on the European Access Point for Truck Parking hosted by DG MOVE.

### 2.3.1 Description of the national activities and projects

Project/activities	Description
NordicWay	Through the NordicWay project, collaboration between the authorities, the automotive industry and the telecom industry, have developed an information exchange solution for different enterprise-specific clouds. Through this cloud it is possible to address specific vehicles, and creating cost-effective opportunities for different security applications. In the longer term, there are also new opportunities for organizing traffic.  Project duration: 2016-2020 Costs: 6 Million SEK per year

### 2.3.2 Progress since 2014

See Section 1.2.1 General progress.

### 2.3.3 Priority Action D: 112 eCall

National eCall PSAPs Infrastructure ready by 1<sup>st</sup> October 2017: YES / NO. If NO, please explain:

Yes.

Authorities that are competent for assessing the conformity of the operations of the eCall PSAPs:

Contact information:

Post- och Telestyrelsen, Box 5398, 10249 Stockholm, Sweden, Pts@pts.se

Additional information:

### 2.3.4 Reporting obligation under Delegated Regulation (EU) No 885/2013 on the provision of information services for safe and secure parking places for trucks and commercial vehicles (priority action e)

Number of different parking places and parking spaces on their territory:

A study has been conducted on state owned rest areas suitable to be included in the information service. However, on several of those locations truck parking is provided as parking lanes with no fixed parking spaces. Hence there are not a fixed number of parking spaces.

A study on which commercial installations that could be included in a first step is ongoing. As this work is in progress, the number of parking places and parking spaces are not available.

Percentage of parking places registered in the information service:

State owned rest areas and commercial installations found suitable will be included in the service.

Percentage of parking places providing dynamic information on the availability of parking spaces and the priority zones: -

An implementation of Priority zones is not foreseen hence only static data will be handled within the framework of the delegated act. Subsequently there will be no dynamic information on the availability of parking spaces.

Additional information: (e.g. has a national access point been set up to provide truck parking data? Does it include dynamic data? What is the source of data (public / private)? Is data published on the European Access Point for Truck Parking hosted by DG MOVE?)

The Swedish National Access Point (NPA) Trafficdata.se also include data for priority action e (truck parking information) and the Swedish state owned rest areas for the delegated act e is published on the European Access Point for Truck Parking hosted by DG MOVE.

## **2.4 Priority Area IV: *Linking the vehicle with the transport infrastructure***

Description of the relevant initiatives, their objective, timescale, milestones, resources, lead stakeholder(s) and status:

C-ITS and the designated Day 1 services (i.e. hazardous location notifications and signage applications) and Day 1.5 services (e.g. vulnerable road user protection, park & ride information) constitute important development of the road transport system. In the short-to-medium term, C-ITS applications are expected to provide increased road safety, new means of optimizing traffic flow and thereby improving the functionality of the entire transport system. For a country as large as Sweden when it comes to land area, third-largest after France and Spain, but with more limited number of inhabitants, it is essential that the infrastructure communication solution chosen is economically sustainable. Consequently, the evaluation of both ITS-G5 and cellular LTE V2X is an essential part of the Swedish strategy. Projects in Sweden and in other Nordic countries are testing hybrid technology and cellular solutions for vehicle-to-vehicle and vehicle-to-infrastructure communication.

The implementation of C-ITS services is still in an early piloting phase. The Swedish Transport Administration together with Sweden's Innovation Authority, and the major city regions are supporting a number of activities related to C-ITS and automated driving, including the Swedish DriveMe initiative for testing autonomous driving in real traffic. There is also a broad participation in the activities by the Swedish industry. The major ones are Volvo Cars Company, Volvo Trucks, Scania, Autoliv and Ericsson.

#### 2.4.1 Description of the national activities and projects

Project	Description
DriveMe	<p>DriveMe, is the world's first large-scale pilot project in autonomous driving where self driving Volvo cars will be driven on public roads in Gothenburg. This project is a joint initiative of Volvo Car Group, the Swedish Transport Administration, Swedish Transport Agency, Lindholmen Science Park and the City of Gothenburg. Drive Me is supported by the Swedish government.</p> <p>Project duration: 2014-2018 Costs: 120 Million SEK</p>
EU EIP ((European ITS Platform)	<p>The sub-activity (cooperative ITS Services Deployment Support) aims at developing and providing deployment guidance to road authorities and operators on Cooperative ITS (C-ITS).</p> <p>Project duration: 2016-2020 Costs: 730 000 SEK per year</p>
CEDR CAD	<p>CEDR is a Platform for cooperation between National Road Authorities in Europe. The Swedish Transport Administration is participating in CEDR/ Working Group on Connected and Automated Driving (CAD). The objective of the group is to increase awareness, develop and share knowledge among NRAs and national road operators and provide strategic assistance and advice to different forums and high level groups, in particular on the implications of ITS and CAD. This CEDR group will also establish a joint strategy for NRAs on data exchange and looking into investments needs of physical and digital infrastructure.</p> <p>Project duration: 2016-2019 Costs: 100 000 SEK per year</p>
Nordicway	<p>The objective of the NordicWay project is to test and demonstrate interoperability of C-ITS (cooperative ITS) services both for passenger and freight traffic, piloting continuous services offering an equivalent user experience in the whole network. NordicWay is a real-life deployment pilot, which will facilitate a wider deployment in the Nordic countries and in Europe in the next phase.</p> <p>First phase has focused on hybrid technology and information exchange between clouds to</p>

	<p>facilitate implementation of day 1 services.</p> <p>Project duration: 2015-2019</p> <p>Costs: approx. 6 Million SEK per year</p>
C-Roads	<p>The C-Roads Platform is a joint initiative of European Member States and road operators which are in the phase of installing C-ITS for testing and later operation. Pilot installations will be harmonized, ensuring interoperability based on cooperation within the C-Roads Platform.</p> <p>Sweden will participate in C-ROADS via the EU project Nordicway II.</p>

## 2.5 Other initiatives / highlights

### 2.5.1 Description of other national initiatives / highlights and projects not covered in priority areas 1-4 and progress since 2014

Description of the relevant initiatives, their objective, timescale, milestones, resources, lead stakeholder(s) and status:

#### 2.5.1.1 Governmental program for next generation travel and transport

The Swedish Government has launched 2016, several strategic cooperative programs. One of them is about future travel and transport. Sweden needs a more transport-efficient society where transports are used smarter and with more resource-efficient vehicles, renewable fuels and less emissions. The cooperation program includes all modes of transport and has an overall perspective where all modes interact to solve the travel of women and men and the need for transport of goods.

#### 2.5.1.2 National ITS Strategy and Action plan -update

An update of the national ITS Strategy and Action plan have been finalized in 2017.

The strategy consists of three basic components;

- A new vision
- Agreed Priority and Horizontal areas to focus on
- A common strategy on the development of all areas

Guiding development principles for the priority areas, as follows:

- The digitization of the transport system should primarily be based on existing infrastructure for IT and telecommunications
- Services and systems should be national and proven solutions, as far as possible standardized and interoperable with solutions within the EU
- Services and systems should be developed with high level of personal integrity and security requirements.
- Services and systems should be user-friendly and accessible
- Data should be open and available for development and innovation.

#### 2.5.1.3 Traffic safety Cameras

Automatic Traffic Safety Control with traffic safety cameras, (ATK) is a system for automatic speed surveillance. The goal of the use of the cameras is to reduce the average speed on roads with high accident risks, and, in this way, reduce the number of fatalities and serious injuries. The system is administered by the Swedish Transport Administration and the Swedish Police. Sweden has installed more than 1500 cameras and a set number of errands (300,000) are investigated by the police yearly. More than 35 % of all errands open to investigation lead to the prosecution of the driver of the pertinent vehicle. It is estimated that the cameras save around 20 lives every year. Additionally, more than 70 people per year are saved from

seriously injured in traffic. The ATK Board has decided to expand the system during a three-year period with 250 cameras each year. The costs are 120 Million SEK per year.

#### ***2.5.1.4 Alcolock/ alcosensor technology***

Alcolocks in vehicles have been installed in Sweden since year 2000. Use of Alcolocks are today to be found in different part transport sectors, such as commercial traffic, professional traffic, business and other public organizations. The Swedish regulation SFS (2009:1) (Regulation on Environmental and Road Safety - requirements for government cars and car journeys) requires alcolocks in vehicles and transport operated by the public authorities. After several years of trial operations, a Driving License Program After Drunk Driving, was established in 2012. In total, more than 80,000 alcolocks are estimated to be installed in vehicles where the main part is used to prevent safe and secure traffic. In addition to installing alcolocks in cars, buses and trucks, they have also been mounted in locomotives, trams and ferries. In Sweden and in the United States development of next generation sobriety support systems is ongoing.

### 3 Key Performance Indicators (KPIs)

*Note: The EC document on "ITS KPIs for the EU" is to be used for comprehensive definitions of the KPIs and further guidance. The EU EIP Activity 5 report on "ITS Deployment and Benefit KPIs definitions" is a complementary document providing in particular estimation methods.*

*KPI will be reported separately by type of road network / priority zone / transport network and nodes (when appropriate).*

#### 3.1 Deployment KPIs

##### 3.1.1 Information gathering infrastructures / equipment (road KPI)

*Figures to be provided by type of network / zone*

*Figures to distinguish fixed and mobile equipment*

*KPI to be calculated by type of network / zone (when relevant)*

- Length of road network type / road sections (in km) equipped with information gathering infrastructures & Total length of this same road network type (in km):

The deployment KPIs are calculated for the TEN-T road network in Sweden with the length of 6 391 km.

- KPI = (kilometres of road network type equipped with information gathering infrastructures / total kilometres of same road network type) x 100

**Road weather KPI<sup>1</sup> = 100**

**Traffic volume services KPI = 100**

##### 3.1.2 Incident detection (road KPI)

*Figures to be provided by type of network / zone*

*KPI to be calculated by type of network / zone (when relevant)*

- Length of road network type / road sections (in km) equipped with ITS to detect incident & Total length of this same road network type (in km):

**Length of Urban Road: = 558 km**

KPI = (kilometres of road network type equipped with ITS to detect incident / total kilometres of same road network type) x 100

**Automated incident detection for fixed equipment KPI = 27**

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<sup>1</sup> The road weather Information is gathering from road weather information systems, the Swedish Meteorological and Hydrological Institute and from contractors.



**Automated incident detection for mobile equipment KPI = 45**

**For manual incident detection on TEN-T roads (from police, emergency service, phone-call from road users and travellers, contractors, road reporters etc) KPI = 100**

### 3.1.3 Traffic management and traffic control measures (road KPI)

*Figures to be provided by type of network / zone*

*KPI to be calculated by type of network / zone (when relevant)*

- Length of road network type / road sections (in km) covered by traffic management and traffic control measures & Total length of this same road network type (in km):

**Length of Urban Road = 558 km**

KPI = (kilometres of road network type covered by traffic management and traffic control measures / total kilometres of same road network type) x 100

**Traffic management and traffic control measures KPI = 27**

### 3.1.4 Cooperative-ITS services and applications (road KPI)

*Figures to be provided by type of network / zone*

*KPI to be calculated by type of network / zone (when relevant)*

Length of road network type / road sections (in km) covered by C-ITS services or applications & Total length of this same road network type (in km):

- KPI = (kilometres of road network type covered by C-ITS services or applications / total kilometres of same road network type) x 100

The implementation of C-ITS services is still in an early piloting phase. KPI is not available at present.

Real-time traffic information (road KPI)

*Figures to be provided by type of network / zone / node.*

*KPI to be calculated by type of network / zone / node (when relevant), and if relevant indicate the proportion of services accessible to passengers with reduced mobility, orientation and/or communication.*

- Length of road network type / road sections (in km) with provision of real-time traffic information services & Total length of this same road network type (in km):

The Swedish Transport Administration provides real-time traffic information on the national roads- and highways (17354 km). De private actors have coverage where their customers travel and that can be for the whole road network.

- $\text{KPI} = (\text{kilometres of road network type with provision of real-time traffic information services} / \text{total kilometres of same road network type}) \times 100$

**Real-time traffic information KPI = 100.**

### 3.1.5 Dynamic travel information (multimodal KPI)

*Figures to be provided by type of network / zone / node.*

*KPI to be calculated by type of network / zone / node (when relevant), and if relevant indicate the proportion of services accessible to passengers with reduced mobility, orientation and/or communication.*

- Length of transport network type (in km) with provision of dynamic travel information services & Total length of this same transport network type (in km):

**Length of urban network = 37 893 km**

**Length of network with provision of dynamic travel information = 37 259**

- Number of transport nodes (e.g. rail or bus stations) covered by dynamic travel information services & Total number of the same transport nodes:

Total number of transport nodes (rail and bus stations): 23 870

**Number of transport nodes covered by dynamic travel information (fixed devices) = 3 162**

**Number of transport nodes covered by dynamic travel information (mobile devices) = 24 324**

- $\text{KPI} = (\text{kilometres of transport network type with provision of dynamic travel information services} / \text{total kilometres of same transport network type}) \times 100$

**Km of transport network type with provision of dynamic travel information services KPI = 98**

- $\text{KPI} = (\text{number of transport nodes with provision of dynamic travel information services} / \text{total number of same transport nodes}) \times 100$

**Transport nodes with provision of dynamic travel information services via fixed devices (signs) KPI = 13**

**Transport nodes with provision of dynamic travel information services via mobile devices (apps and web) KPI = 100**

### 3.1.6 Freight information (multimodal if possible or road KPI)

Figures to be provided by type of network / zone / node.

KPI to be calculated by type of network / zone / node (when relevant), and if relevant indicate the proportion of services accessible to passengers with reduced mobility, orientation and/or communication.

There are a limited number of dedicated freight services commonly available in Sweden. They cover the entire road network or a specific network such as TERN. In addition, there are locally provided services as an integrated part of different stakeholders businesses. Development and deployment of cellular hybrid communications is expected to facilitate various priority services with freight relevance such as access management and capacity allocation.

- Length of road network type / road sections (in km) with provision of freight information services & Total length of this same road network type (in km):  
N/A
- Number of freight nodes (e.g. ports, logistics platforms) covered by freight information services & Total number of the same freight nodes:  
N/A
- KPI = (kilometres of road network type with provision of freight information services / total kilometres of same road network type) x 100  
N/A
- KPI = (number of freight nodes with provision of freight information services / total number of same freight nodes) x 100  
N/A

### 3.1.7 112 eCalls (road KPI)

N.a. – will be provided through the COCOM 112 questionnaire

## 3.2 Benefits KPIs

### 3.2.1 Change in travel time (road KPI)

Figures to be provided also include vehicle.km for the route / area considered

- KPI = ((travel time before ITS implementation or improvement – travel time after ITS implementation or improvement) / travel time before ITS implementation or improvement) x 100

There are no travel time measures before/after ITS installations available.

### 3.2.2 Change in road accident resulting in death or injuries numbers (road KPI)

Results shall be provided / aggregated at national level to be representative enough. If possible, distinction can be made between accidents resulting in deaths, serious injuries or slight injuries.

Figures to be provided also include vehicle.km for the route / area considered.

- Number of road accident resulting in death or injuries before ITS implementation or improvement:

#### *Automatic Traffic Safety Control (ATK)*

There are no before / after measures on installations of road safety cameras. Since 2014, the Swedish Transport Administration has established around 400 places with Automatic Traffic Safety Control which together covering around 1000 Km of road network. The 400 new cameras have saved lives of 4 people between the years 2014 – 2016 according to assessment by the Administration.

### 3.2.3 Change in traffic-CO2 emissions (road KPI)

Routes / areas where ITS has been implemented or improved should be specified. Length along / area within which the change in CO2 emissions is calculated should be long / wide enough to be representative.

A CO2 KPI on network level is not available. (Individual projects can be assessed.) There is no general relation between ITS implementation and effect on CO2 emissions. The effect will depend on how traffic volume and overall vehicle mileage is affected. It is also dependant on perspective in terms of area studied (for example city-center and region). The main issue is how to use potential and existing tools in the ITS tool box together with other measures. If a road pricing scheme is in operation, changes in price levels will most likely have greater effect than improvement of the system as such. Assessments are made based on calculations of a socioeconomics models for CO2 emissions. During 2014-2016, the carbon dioxide emissions are estimated to have decreased thanks to ATK (Road safety cameras) by 24 566 tonnes.

- KPI = ((traffic CO2 emissions before ITS implementation or improvement – traffic CO2 emissions after implementation or improvement) / traffic CO2 emissions before ITS implementation or improvement) x 100

N/A

### 3.3 Financial KPIs

#### 3.3.1 Investments

Common ITS investment measures are such as e.g. Motorway Control Systems, Tunnel control systems, Variable Message Signs, Variable speed limits, Cameras for speed control, Cameras for monitoring, Travel time detection, Weigh In Motion etc.

**Annual investments in road infrastructure 2014-201 in (SEK) and prognosis for 2017**

2014 -2017: 8000 Million SEK per year

**Annual investments in ITS**

2014-2017: 450 Million SEK per year

**Annual road ITS investments as a % of total road transport infrastructure investments:** approx. 6%

#### 3.3.2 Operating & maintenance costs per Km network covered

**Costs**

2014-2017: 220 Million SEK per year

**Road network covered**

TEN-T Sweden: 6 391 km

**Annual operating & maintenance costs of road ITS (in Euros per kilometre of network covered):**

35 000 SEK/ Km or 3700 Euro/km

**Kommentar [RCP1]:**