EUROPEAN
COMMISSION

Brussels, 11.11.2024
C(2024) 7744 final

ANNEXES 1 to 2

ANNEXES

to the

COMMISSION IMPLEMENTING DECISION

laying down the template including key performance indicators for reporting by the Member States under Directive 2010/40/EU of the European Parliament and of the Council

ANNEX I

Template for the initial report and progress reports

Directive 2010/40/EU Implementation Report 2025 *Denmark*

20 March 2025

Table of Contents

1. INTRODUCTION

1.1. General overview of the national activities and projects

Including national Intelligent Transport Services ('ITS') legislation or strategies, or both:

Tender on Floating Car Data: Re-tendering on the supply of data

GPS-based solution at Aarhus Municipality: New solution for measuring the level of service

Compliance on Delegated Regulation on RTTI: Development of conversion modules for Danish Road Directorate (DRD) dataset

Appointment of the Danish Civil Aviation and Railway Authority as ITS National Body

The NAP was updated to support mobilityDCAT-AP and the minimum data profile

Transformation project for traffic signals is aiming at getting a uniform IT structure and to improve IT security

Weigh-In-Motion stations to enforce overweight heavy vehicles placed in collaboration with national police

TRACÉ: An updated cloud-based traffic management system now fully implemented in the DRD Traffic Centre

Automatic Traffic Control at the Great Belt Bridge, ITS at Dangerous Intersections, ITS at School Roads and Wrong Way Driver Detection Systems are measures to increase road safety aimed at specific risk factors

eCall: Adapting the infrastructure to 4G/5G

C-ITS pilot testing: Testing of Road Works Warning (RWW) and Emergency Vehicle Approaching warning (EVA)

Participation in EU funded projects: NordicWay 3, NAPCORE, MODI, C-ROADS and CCAM

The GNSS-based Toll Charging by Sund & Bælt: GNSS-based tolling system for trucks over 12 tonnes, replacing the Eurovignette with kilometer-based and CO_2-differentiated model

1.2. General progress since 2023

Summary of progress since previous report:

Securing supply of data for planning

Finalisation of a contract with a new supplier of Floating Car Data (non real-time) for data-driven tools used within the DRD, has secured the renewed delivery of data for various data-driven tools within traffic planning and analysis.

Control of Traffic Signals

Transformation Project for Traffic Signals has reached a status of deploying approximately a third of the new Traffic Light Controllers planned, the goal being 320 in total. New systems for monitoring and control have been implemented, as well as an IT safe network structure on mobile LTE.

In this context, Aarhus Municipality has taken over the programming of their signal systems, making changes faster and easier. Using traffic management, they are constantly testing new solutions, particularly focusing on the detection of vulnerable road users.

Upgraded/renewed systems

Aarhus Municipality has switched to a new GPS-based solution after assessing the superiority of GPS data over the former Bluetooth solution.

When updating the metadata registration flow on the Danish NAP, the DRD also implemented the mobilityDCAT-AP metadata model. Additionally, the NAP has been updated to allow direct access to SIRI data.

The Weigh-In-Motion (WIM) Project is almost fully etstablished, still awaiting the completion of motorway projects for the last WIM stations to be installed.

The efficiency of TRACÉ has improved by full integration to the application GUI-SLM controlling and monitoring ITS roadway equipment. Integration to the SoMe and other systems has sped up the info flow. Likewise, improved integration to the Danish National Alarm System, 112, increases the accuracy of detailed information and the speed of the information delivery to 112.

The upgrade of ITS solutions at Dangerous Intersections and at School Roads reduces the risk of accidents, together with strategic location of Wrong Way Driver Systems. Hopefully, the number of speed induced accidents will be further reduced when the Automatic Traffic Control becomes functional ultimo 2025.

The switch from 2G/3G to 4G/5G is currently ongoing. Tests of the updated eCall standard will show how existing vehicles handles the transition when 2G/3G has been phased out, expectedly before 2027.

Sund & Bælt replaced their former tool for truck tolling with a Toll Charger Dominant, GNSS-based tolling system. The new system represents a significant upgrade, using a CO_2-differentiated model, thus aligning tolling with actual road usage and environmental impact.

Aarhus Municipality switched from a Bluetooth solution to monitor accessibility to a GPS-based solution for creating a congestion index as a measure of the development in the level of service, and they use travel time data to assess the need for, and the effect of, changes made regarding traffic signal systems. They also aim at making the best use of infrastructure by providing information for drivers on dynamic signs, supporting informed decision making on choice of route.

C-ITS Pilot and other activities contributing to priority area IV of the ITS Directive

The DRD conducted its first small C-ITS pilot to start gaining experience on two use cases. The pilot resulted in valuable knowledge that will only come from putting C-ITS tools to use, even at a smaller scale. The pilot also included knowledge exchange with other EU road authorities.

Via participation in NordicWay 3, Denmark tested and verified, in a Danish context, the concepts developed or used by the other project partners.

As a partner in the CCAM Association, the DRD continues to contribute to improving road safety and efficiency, ensuring inclusive mobility for all, as well as accessibility for goods. Furthermore, being a partner the DRD contributes to further accelerating the deployment of new CCAM technologies.

The DRD also participates in the MODI Project as an associated partner. The DRD has special focus on the readiness of the physical and digital infrastructure, and will, to some extent, follow and comment on other relevant topics and evaluation results.

Progress on implementation of Delegated Regulations under the ITS Directive

In compliance with **Delegated Regulation (EU) 2017/1926 on MMTIS**, static and dynamic travel and traffic data in NeTEx and SIRI are accessible via the NAP. At present, the static data covers all regional and local buses, all types of trains, 50% of ferries, and 20% of micro-mobility services.

The dynamic data, which provides real-time updates, is available for all regional and local buses and 90% of trains.

Additionally, the NAP provides access to the road network, including partial coverage of the cycling network, location search data, information on lorry parking spots, and bridge status updates.

To ensure compliance with **Delegated Regulation (EU) 2022/670 on RTTI**, the DRD, as the Danish ITS authority, shared experience based knowledge with the municipalities and other external dataowners from our own compliance process. As a tool for making internal DRD data available via the NAP, our IT department is currently responsible for the development of conversion modules to convert data set covered by the DR on RTTI to the required format. Municipalities are allowed to make use of the conversion modules. However, this is only possible for those using the same road management system and having the same data types as the DRD, in practise approximately half of the Danish municipalities.

To comply with **Delegated Regulation (EU) No 886/2013 on SRTI**, the DRD makes use of TRACÈ PowerBI tool to monitor data quality. Multiple projects, also using the PowerBI, increased the focus on data governance. Both factors have resulted in improved update of traffic information to communicate e.g., when the accident is protected, formally leaving the scope of the DR SRTI.

Compliance with the **Delegated Regulation (EU) No 885/2013 on SSTP** is progressing. Data is planned for availability via the NAP in the future, including the European Access Point for Truck Parking. Meanwhile, the truck drivers may make use of the booking services at the two biggest safe and secure parking places to reserve their spot.

To ensure compliance and work towards European interoperability, the DRD is participating in the **NAPCORE** project, being a unique project on harmonising mobility data platforms and their access and minimum service levels.

1.3. Contact information

Senior Advisor Lone Dörge (lod1@vd.dk) and Academic Specialist Lise Steffensen (lks2@vd.dk), the Danish Road Directorate, the DRD, Carsten Niebuhrsgade 49, 1577 Copenhagen V.

2. MAIN PROJECTS, ACTIVITIES AND INITIATIVES

2.1. Priority area I. Information and mobility ITS services

2.1.1. Description of the main national activities and projects

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

Tender on Floating Car Data for planning

The DRD procures and utilises Floating Car Data for a range of data-driven tools within traffic planning and traffic analysis. Every few years, a re-tendering of this supply is conducted. The contract for the latest data delivery expired in 2024, necessitating a re-tendering process. A major difference is, however, that the new contract does not include real-time data.

Participation in the NAPCORE project

The DRD is participating in the NAPCORE project, being a unique project on harmonising mobility data platforms and their access and minimum service levels. DRD has gained valuable insights in metadata description needs and data managerial issues via our participation in and contribution to the project. Further, the DRD has actively been part of a demonstrator activity, showcasing the data exchange between NAPs and an Interchange Node Mechanism. The DRD was also the first country to implement mobilityDCAT-AP in 2024.

New GPS-based solution at Aarhus Municipality

Aarhus Municipality has switched from at Bluetooth solution to monitor accessibility to a GPS-based solution for creating a congestion index as a measure of the development in the level of service, and they use travel time data to assess the need for, and the effect of, changes made regarding traffic signal systems. The municipality also aims at making the best use of infrastructure by providing information for drivers on dynamic signs, supporting informed decision making on choice of route.

2.1.2. Progress since 2023

Description of progress in the area since 2023:

Tender on Floating Car Data (FCD)

In 2024, the DRD completed a tender process for the procurement of FCD data. A contract has been signed with the new supplier, and the implementation of the new delivery is underway.

New GPS-based solution at Aarhus Municipality

Aarhus Municipality has, after several years, assessed that GPS data has become better and cheaper than the previous Bluetooth solution. Therefore, Aarhus Municipality has switched to this solution. The change means that Aarhus Municipality can no longer share data externally, as GPS data is purchased for internal use within the municipality.

Aarhus Municipality has introduced a strategy regarding dynamic signs. This means that all signs can be controlled from the same central system. In the future, fully graphic signs will be installed, making the signs more flexible in their function. The solution will include all types of variable signs, including, for example: speed signs, school patrol signs, parking guidance signs and information signs.

Since 2019, Aarhus Municipality has separated the procurement of control devices and installation for signal systems. In this context, Aarhus Municipality has taken over programming, making changes to signal systems faster and easier. Aarhus Municipality uses a high degree of traffic management, making information about signal settings less relevant, as green times, etc., will vary. Aarhus Municipality is constantly testing new detection solutions, with a particular focus on better detection of vulnerable road users. The use of detection means that traffic counts are increasingly carried out in signal systems.

2.1.3. Delegated Regulation (EU) 2017/1926 on the provision of EU-wide multimodal travel information services (priority action a)

Progress made in terms of the accessibility, exchange and reuse of the travel and traffic data types set out in the Annex:

Static and dynamic travel and traffic data in NeTEx and SIRI are accessible via the NAP. The static data covers all regional and local buses, all types of trains, 50% of ferries, and 20% of micro-mobility services. The dynamic data, which provides real-time updates, is available for all regional and local buses and 90% of trains. Additionally, the NAP provides access to the road network, including partial coverage of the cycling network, location search data, information on lorry parking spots, and bridge status updates.

Although static data has been available for several years and dynamic data for more than six months, these datasets have not yet been utilized. As of now, no significant benefits from the implementation of NeTEx and SIRI have been observed in Denmark.

Geographical scope of the data set out in the Annex accessible via the national access point, and their quality, including the criteria used to define this quality and the means used to monitor it:

The data available via the NAP covers the entire territory of Denmark.

Quality control is ensured through pre-publication review processes, and metadata requirements align with mobilityDCAT-AP.

Linking of travel information services:

At present, we are not aware of any requests from travel information service providers regarding access to routing results. Consequently, no formal linking of services has been established.

Results of the assessment of compliance referred to in Article 9:

Denmark has established a NAP at https://du.vd.dk, managed by the DRD. The NAP is prepared for the upload of static and dynamic MMTIS data and supports multiple data provision methods.

Data is provided in NeTEx, SIRI, or in accordance with the INSPIRE directive and includes essential information for journey planning and real-time updates on delays. However, there is currently no data available on fares, tickets, or other more detailed data types.

Data is reviewed before publication to ensure alignment with national profiles and European standards. Updates occur continuously, with most timetables being refreshed daily.

The Danish Civil Aviation and Railway Authority, which has been designated as the Danish National Body/Competent Authority, has not yet conducted a compliance assessment for Delegated Regulation (EU) 2017/1926. The compliance assessment is planned to take place from May to August 2025.

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

When updating the metadata registration flow on the Danish NAP, we have at the same time implemented the NAP to support the mobilityDCAT-AP metamodel.

Metadata is created and maintained by the data provider. Additionally, the NAP has been updated to allow direct access to SIRI data.

Additional information (e.g. have mobilityDCAT-AP or other metadata catalogues been implemented?):

The NAP supports mobilityDCAT-AP. The DRD was among the first NAP to implement this. Minor adjusments needs to be made.

2.1.4. Reporting obligation under Delegated Regulation (EU) 2022/670 on the provision of EU-wide real-time traffic information services (priority action b)

Progress made in terms of the accessibility, exchange and reuse of the data types set out in the Annex:

To comply with the Delegated Regulation (EU) 2022/670, the DRD started a project at the beginning of 2024 to:

a) Work with internal data owners to inform about the requirements and support compliance.
b) Inform external data owners about their obligations to make data accessible in the required formats.
c) Build modules to convert data into the required formats.

Ad a):

DRD internal data owners worked with IT and administrative colleagues to determine the quality of data covered by the DR and to initiate the process of preparing their data for the Danish NAP. Since data were originally created for other purposes, this was a significant step, including for the IT department to build modules to convert data to the required formats.

Ad b):

The DRD hosted virtual meetings in May and November 2024 to inform external data owners, primarily municipality representatives, of their responsibilities to prepare their data within their respective organisations for being accessible via the Danish NAP. As most external dataowners are not familiar with the DR, this included sharing our experiences of working with internal data owners and showing how to register and create their data via the Danish NAP.

Ad c):

The DRD IT department is currently developing the modules for converting data to the formats required in the DR. The modules are build for the purpose of making internal DRD data set available and will be made available for data owners who are able to use them, as they use the same data management system (approximately half of the municipalities). The DRD expects the modules to be fully functional in June 2025 at the latest.

Geographical scope of the data accessible via the National Access Point, changes to the primary road network and to the data content of real-time traffic information services and their quality, including the criteria used to define this quality and the means used to monitor it:

The geographical scope is the TEN-T road network and for some data types the main network is also included.

Results of the assessment of compliance referred to in Article 12 with the requirements set out in Articles 3 to 11:

The Danish Civil Aviation and Railway Authority, which has been designated as the Danish National Body/Competent Authority, has not yet conducted a compliance assessment for Delegated Regulation (EU) 2022/670. The compliance assessment is planned to take place from May to August 2025.

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

The NAP has been updated to support mobiltyDCAT-AP and to live up to the minimum data profile.

Metadata fields for describing data quality is also available, but not mandatory to fill in.

Depending on data category, the dataset is automatically tagged with the relevant delegated regulation. It is possible to choose more than one data categoryto tag the dataset with more than one delegated regulation.

Additional information (e.g. what data types are being provided? Have mobilityDCAT-AP or other metadata catalogues been implemented? Are quality requirements being checked?):

The National Access Point supports mobiltyDCAT-AP.

2.2. Priority area II. Travel, transport and traffic management ITS services

2.2.1. Description of the main national activities and projects

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

Transformation Project for Traffic Signals

Transformation Project for Traffic Signals in the DRD was started in 2021. The overall aim is to create a uniform IT structure and align platforms between different vendors to improve IT security and the execution of program changes, also enabling vehicle priority based on central data exchange and preparation for future C-ITS extensions.

Weigh-In-Motion Project, WIM Project

The DRD has previously decided to establish a number of WIM stations distributed across various sections of the national road network. The selection of sections and placement of WIM stations was carried out in collaboration with the National Police. The participation of the National Police has helped ensure that the completed WIM stations can support the work of the police enforcing regulations on overweight heavy vehicles.

In addition to this, the DRD uses weight data from WIM stations in relation to road authority tasks, planning, and operational tasks.

TRACÈ

As mentioned in the last report, the National Traffic Centre implemneted a new and updated cloud-based trafiic management system called TRACÉ in 2023. The renewal of the main system brought several improvements. The most important improvements were:

- A cloud based scalable system using standard API's, micro services and in general prepared for new data sources.
- A high degreee of DATEX II compliance
- Faster workflow for safety related incidents.

Recently, a data survey revealed a reduction in time spent to issue the first traffic announcement for safety related traffic information a about 40 %. This is mainly due to automatisation and optimisation of workflow in TRACÉ and is considered a big succes for the system. Future plans for improving TRACÉ includes for example requesting road assistance digitally using information already known by TRACÉ and thereby saving time. The primary goal is to ensure fast road assistance response to safety related incidents and to restore normal traffic conditions faster. There will also be several improvements involving further automation, for exsample the built-in ability to send SMSs to a target groups in TRACÉ and the integration to data bases containing vehichle information. A higher degree of systems support and automation will provide more time spent at the Traffic Centre monitoring roads 24/7 and increase their ability to issue fast and accurate traffic information when needed.

2.2.2. Progress since 2023

Description of progress in the area since 2023:

Transformation Project for Traffic Signals:

- continued to deploy new Traffic Light Controllers based on OCIT communication and LISA programming. So far around 100 out of 320 controllers have been replaced.
- procured and implemented a new SCADA system for monitoring and control based on OCIT. Implementing will be finalised Q2 2025. The implementation exchanges data via the NAP, including Traffic Management detector data for enhanced network control.
- developed and implemented an IT safe network structure based on mobile LTE on a separate contract.

Upcoming risk for the project: All new controllers are programmed using the LISA software package from Schlothauer & Wauer, now a part of the Swarco Group. April 2024 Swarco announced a purchace stop for aquiring new LISA licenses in the nordic countries, which has cast a shadow over the future of the independent programming tool. So far the Municipality of Aarhus has started a legal case via the Danish Competition and Consumer Authority which outcome the project awaits.

Weigh-In-Motion Project, WIM Project

The majority of the planned WIM stations have been established. A smaller number of WIM stations are still pending because their establishment awaits the completion of the respective motorway expansion projects. Once these expansions are completed, the remaining WIM stations will be installed.

TRACÈ

Since the implementation of TRACÉ Part 2 in October 2023, the Traffic Centre has on a continuous basis worked on improving its efficiency by further automation, adding new features and resolving bugs to increase system performance. Some highlights would be:

- TRACÉ is now fully integrated to the application GUI-SLM controlling and monitoring ITS roadway equipment. Workflow is therefore significantly improved when handling ITS equipment during incidents and also handling errors. Information is automatically transferred between the two systems reducing time and effort.
- Integration to other systems such as X (SoMe) for fast information flow
- Improved integration to the Danish national alarm system 112 ensuring that information about incidents is received faster with more accurate details.

Several other minor improvements have been made in close cooperation with primary users and stakeholders. Developing team is currently releasing a new version of TRACÉ every month ensuring quick response to needs and constantly optimising TRACÉ.

Data visualisation is still handled in a BI solution offering a variety of possibilities to analyse data and using these data for ideas to improvement.

2.3. Priority area III. Road safety and security ITS services

2.3.1. Description of the main national activities and projects

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

ITS at Dangerous Intersections

ITS at dangerous intersections involves measures to reduce the speed on ITS signs for motorists on side roads in cases where traffic is detected on the main road. The goal is to reduce the number of accidents caused by excessive speed.

ITS at School Roads

ITS on school roads consists of ITS signs designed to reduce speed when school is open. This is achieved either by using school calendars that indicate when school activities can be expected. When the signs are not calendar-controlled, the speed of motorists is displayed on the signs instead.

Wrong Way Detection Systems

Wrong way detection systems are located at motorway exits and are designed to prevent motorists from mistakenly driving onto the motorway. Wrong way detection systems can be divided into two categories. The first category involves flashing lights that warn wrong-way drivers that they are heading onto the motorway in the wrong direction. There is no central monitoring. The second category involves systems with the same feature, but with 24/7/365 monitoring from a central location. This monitoring occurs in real-time and aims to inform the public about the presence of a possible wrong-way driver.

Automatic Traffic Control (ATK) at the Great Belt Bridge

The Automatic Traffic Control project, which was launched in 2023, aims to help the Great Belt Bridge and the Danish Police identify vehicles exceeding the maximum speed limit, so that fines can be issued to those driving too fast. Initially, two ATK stations will be installed on the Great Belt Bridge, one in each direction. The two stations will receive input from the variable speed signs that are also on the bridge, so that the speed limit is always in accordance with the speed shown on the variable speed signs.

2.3.2. Progress since 2023

Description of progress in the area since 2023:

ITS at Dangerous Intersections

ITS at dangerous intersections is currently undergoing a technical upgrade to ensure that the speed indications are accurate and require minimal maintenance.

ITS on School Roads

For ITS on schools roads, the signs have just been upgraded so that the calendar function can be controlled remotely. Additionally, the signs have been renewed, and it is expected that the effort required for maintenance can be reduced.

Wrong Way Detection Systems

Wrong way detection systems have not been upgraded technically, but locations with a potentially higher number of wrong-way drivers are currently being identified. This is with the aim of implementing 24/7/365 monitoring at these sites.

Automatic Traffic Control (ATK) at the Great Belt Bridge

The ATK system at the Great Belt Bridge will be put into operation no later than the third or fourth quarter of 2025.

2.3.3. 112 eCall (priority action d - Delegated Regulation (EU) No 305/2013)

Information on any changes regarding the national eCall PSAPs infrastructure and the authorities that are competent for assessing the conformity of the operations of the eCall PSAPs:

The Delegated Regulation regarding eCall standards has been updated because eCall previously initiated emergency calls via 2G/3G telecommunications networks, which are being phased out in Europe. The exact date for out phasing in Denmark for both 2G/3G is expected to be before 2027. The revised regulation has updated the technical provisions on telecommunication standards and communication protocols, enabling eCall systems to operate on modern 4G/5G telecommunications networks. Currently, testing of the updated standard is on going, along with investigations into how existing vehicles should be handled once 2G and 3G are fully phased out.

The legal act requires that Public Safety Answering Points (PSAPs) for eCall in Denmark, such as Greater Copenhagen Fire Department, must be capable of receiving and handling eCalls via 4G and 5G from January 1, 2026, through 4G or 5G telecommunications networks. This involves an adaptation of the infrastructure, as the current 2G/3G networks operate on Circuit-Switched (CS) telecommunications networks, while the new 4G and 5G networks are based on Packet-Switched (PS) telecommunications networks.

Additional information:

N.A.

2.3.4. 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)

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:

Implementation and use of TRACÉ PowerBI in order to monitor quality and an increased focus on data governance using this implementation. Specifically, there have been multiple projects in this regard on accidents in an SRTI sense. The first one, mainly with a focus on knowing the general quality, involves a new protocol when working with unprotected accident areas. The second one with a big focus on the quality requirements set out by Data for Road Safety (DfRS), timeliness and accurate location.

Lastly there has been a project on alligning processes within the Traffic Center, that can possitively affect the traffic information on accidents.

After the foarementioned projects on accidents, we have become faster and better at updating traffic information, when accidents go from unprotected to protected, effectively ending the part of the accident covered by Delegated Regulation on SRTI. The remaining changes are still in process and has not yielded expected results yet, however, they are showing good tendencies so far.

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

The Danish Civil Aviation and Railway Authority, which has been designated as the Danish National Body/Competent Authority, has not yet conducted a compliance assessment for Delegated Regulation (EU) 886/2013. The compliance assessment is planned to take place from May to August 2025.

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

The NAP has been updated to support mobiltyDCAT-AP. But more importantly, it supports the use of AMQP, which means that service providers can subscribe to the datafeed containing SRTI messages and get them instantsly. The AMQP pushes all changes in real time. Volvo Cars started using this datafeed in 2024 – passing on information about accidents directly to the incar navigation systems, saving valuable procsessing time.

Additional information (e.g. sources of data used for the provision of safety-related traffic information):

We are currently looking into whether data from DfRS will make our traffic information better and faster. So far it seems to be the case, and for that reason we will continue, though we are still not using the data operationally.

2.3.5. 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:

There are 3 different parking places owned by *private* operators:

- Cirkle K Padborg (50 parking spaces)
- Recharge City (450 parking spaces)
- ParkBird Secure Truck parking Aalborg (60 parking spaces)

There are 90 different *public* parking places operated by the DRD. They have a varying number of parking spaces from 2 to 69. The amount of total parking spaces is around 1200. (See link: Parkeringsbåse til person- og lastbiler på rastepladser langs motorvejene). There may also be some other parking places for trucks that are open to the public. However, the number is unknown.

Percentage of parking places registered in the information service:

None of the parking places are registered via the NAP. The 3 private operators mentioned above are being advised to do so, to also benefit their own business by adverting their safe truck parking.

The parking places operated by the DRD will be registered soon.

Even though there are not any registered parking places available via the NAP, some information can be found via websites:

Recharge City has their data and information about the parking place publicly available on the Internet. Link: Recharge City | A break full of energy

Circle K Padborg has their data and information about the parking place publicly available on the Internet. Link: Secure parking | sikker parkering | Circle K | Padborg

Vejdirektoratet has their data online as well.

See link: Parkeringsbåse til person- og lastbiler på rastepladser langs motorvejene).

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

None of the parking places are currently providing dynamic data via the NAP.

However, Recharge City is providing a Booking Service for truck drivers to reserve a parking space.

Link for booking at Rehcarge City: Book truck parking | Recharge City

There are 4 rest areas operated by the DRD with dynamic data for the parking. This data will be available via the NAP in the future.

Additional information: (e.g. has a national access point been set up to provide truck parking data? Does this include dynamic data? What is the source of data (public / private)? Are the data published on the European Access Point for Truck Parking hosted by DG MOVE? If not, is there any intention to do so in future?)

The NAP has been set up to provide truck parking data. This includes dynamic data.

The source of data for ParkBird Secure Truck parking Aalborg, Cirkle K Padborg and Recharge City is private. The data from the DRD is public. None of the data is published on the European Access Point for Truck Parking, but it is intended to do so in the future.

2.4. Priority area IV. ITS services for cooperative, connected and automated mobility

2.4.1. Description of the main national activities and projects C-ITS-pilot:

Description of the relevant initiatives, their objective, timescale, milestones, resources, lead stakeholder(s) and status: in particular, provide information on the C-ITS deployment initiatives and their technical specifications.

NordicWay 3

NordicWay 3 was a C-ITS pilot project that enabled vehicles, infrastructure and network operators to communicate safety hasards and other information from roads in the Nordic countries between different stakeholders. The project was co-funded by the EU.

The project (2019-2023) was a collaboration between public and private partners in Finland, Norway, Sweden and Denmark and build on the achievements from the previous NordicWay projects and the C-Roads platform.
Denmark did not have its own pilot, but has been testing and verifying that the NordicWay

concepts developed or utilised by the other partners in NordicWay 3 and in C-ROADS, are easily transferable to Danish conditions**.**

NordicWay 3 had four so-called flagship pilots: Traffic Signals, Dynamic Zones, Emergency Vehicle Warnings and Road Works Warning (https://www.nordicway.net/. Further, a number of PoCs (Proof of Concept) and analyses were conducted.

C-ITS pilot testing

During 2024, the DRD tested the C-ITS service for Road Works Warning (RWW) at the E45 motorway in Eastern Jutland in connection with long-term static road works, and further, the C-ITS service on Emergency Vehicle Approaching (EVA) with a single rescue vehicle at the motorway network around Copenhagen. The C-ITS services tested followed the C-ROADS specifications.

The CCAM Partnership

Like sister organisations in other European countries, the DRD is a member of the CCAM Association. The CCAM Partnership is a collaboration between the European Commission and the CCAM Association. The CCAM Association is a public/private partnership between private stakeholders, companies, research institutes, associations, public and local authorities.

The goal of the CCAM Partnership is to:

- Improve road safety
- Ensure inclusive mobility for all
- Ensure accessibility for goods
- Reduce the environmental impact of road transport
- Increase the competitiveness of European industry
- Accelerate the development and implementation of CCAM solutions

The MODI Project

The MODI project is a project under the CCAM Partnership. It aims at speeding up the introduction of highly automated freight vehicles through demonstrations and to overcome barriers for the roll-out of automated transport systems and solutions in logistics.

The project comprises five use cases, each describing a part of the logistics chain. It identifies what is required for automated driving without human interaction (known as SAE level 4), and what is not possible yet. The project will focus on understanding and overcoming the regulatory barriers and physical and digital infrastructure shortcomings on the motorway corridor for public roads. The confined areas and terminals are located at and around Rotterdam, Hamburg, Gothenburg, and Moss ports. Each terminal focuses on challenges like access control, charging, coordination with automated guided vehicles, loading/unloading and handover from public to confined areas.

In addition to the demonstrations, MODI provides detailed business models for the logistics sector, demonstrating that CCAM vehicles can lead to greater profits, especially when driving in a coordinated way. The output will also be proposals for adaptation of regulation, infrastructure and technical and socioeconomic impact analyses. The project is planned to be carried out on a transport corridor from the Netherlands through Germany, Denmark, Sweden, and Norway.

MODI received an EU funding grant of nearly €23 million by the European Commission under the programme Horizon Europe and has a total budget of approximately € 28 million. Project coordinator is ITS Norway, and the project duration is 1 October 2022 to 31 March 2026. Overall the project progresses as planned.

The DRD participates in the project as an associated partner without EU funding. The DRD has special focus on the readiness of the physical and digital infrastructure, but will also, to some extent, follow and comment on other relevant topics and evaluation results.

Pilot on automated vehicles

Since July 2017 it has been possible to get a license to conduct tests with automated vehicles on public roads up to SAE level 4 in Denmark. The basis for the tests is new legislation passed unanimously in the Danish parliament in May 2017. An amendment of the test-legislation is expected to go through Parliament in 2025.

Toll Charging managed by Sund & Bælt

Managed by Sund & Bælt A/S, Denmark has introduced a Toll Charger dominant, GNSS-based tolling system for trucks over 12 tonnes, replacing the Eurovignette with a kilometer-based and CO_2-differentiated model. The system was introduced on 1 January 2025 and aligns tolling with actual road usage and environmental impact. The new system calculates tolls based on distance travelled, CO_2 emission class, vehicle weight, and low-emission zones, promoting fairer and environmentally friendly road usage. The platform offers flexibility with On Board Units for frequent users and prebooked route tickets for occasional users, ensuring efficient and user-friendly operations. The system also includes fully automated enforcement connected to EUCARIS and the Danish National Vehicle Registry.

2.4.2. Progress since 2023

Description of progress in the area since 2023

NordicWay 3

The NordicWay 3 project delivered its final reporting in the first half of 2024 with findings, results and recommendations (https://www.nordicway.net/)

C-ITS pilot testing

Refer to 2.4.1

The CCAM Partnership

The DRD still participates in the CCAM Partnership through membership of the CCAM Association and the deployment of the CCAM strategic research and innovation agenda (SRIA).

Furthermore, the DRD participates in relevant projects funded by CCAM Partnership. Currently primarily in the MODI project. (cf. 2.4.1.)

Toll Charging managed by Sund & Bælt

The Eurovignette was replaced with the abovementioned kilometer-based and CO_2 differentiated model for truck tolling.

The system was introduced on 1 January 2025.

2.5. Availability and accessibility via NAPs of data types listed in Annex III to Directive 2010/40/EU

Calculation principles:

** For static information: based on length divided by total length in kilometres. The total length is the length of the network on which underlying information exists, e.g. speed limits apply (almost) everywhere, but access conditions for tunnels apply only to (the length of) tunnel sections.*

*** For dynamic/temporary information: availability of data refers to the ability to make the data available and accessible in a machine-readable format on a certain percentage of the network, whenever the underlying information exists / appears, based on the length of the network with this capability divided by total length in kilometres.*

2.5.1. Data relating to the provision of EU-wide road traffic information and navigation services

Data type	Geographical coverage	% of geographical scope where data type is available		Comments
1. Data relating to the provision of EU-wide road traffic information and navigation services:				
1.1 Category: Static and dynamic traffic regulations, where applicable, concerning:				
1.1.1 Subcategory: - access conditions for tunnels - access conditions for bridges - speed limits - overtaking bans on heavy goods vehicles - weight/length/width/height restrictions	The trans-European *core* network for roads	access conditions for tunnels*	*0 %*	*The data are available but are not yet in the correct data standards acc. to DR RTTI reguirements*
		access conditions for bridges*	*0 %*	*The data are*

				available but are not yet in the correct data standards acc. to DR RTTI reguirements
		speed limits*	*100 %*	
		overtaking bans on heavy goods vehicles*	*0 %*	
		weight/length/width/height restrictions*	*0 %*	*Relevant data are available but are not yet in the correct data standards acc. to DR RTTI reguirements*
	The comprehensive trans-European network for roads, other motorways and sections of primary roads, where the total annual average daily traffic is more than 8 500 vehicles, and all roads in the cities at the centre of each Urban Node (if applicable limited to > 7 000 vehicles/day)	access conditions for tunnels*	*0 %*	
		access conditions for bridges*	*0 %*	
		speed limits*	*Min. 60 %*	*For the state road network 100 % and for*

				the municipality roads appr. 60 %
		overtaking bans on heavy goods vehicles*	*0 %*	
		weight/length/width/height restrictions*	*0 %*	
Subcategory: - one-way streets	*Road infrastructure in the cities at the centre of each Urban Node*	one-way streets*	*0 %*	
Subcategory: - freight delivery regulations	*Road infrastructure in the cities at the centre of each Urban Node*	freight delivery regulations*	*0 %*	
Subcategory: - direction of travel on reversable lanes	*The core and comprehensive trans-European network for roads, other motorways and sections of primary roads, where the total annual average daily traffic is more than 8 500 vehicles, and all roads in the cities at the centre of each Urban Node (if applicable limited to > 7 000 vehicles/day)*	direction of travel on reversable lanes*	*0 %*	
Subcategory: - traffic circulations plans	*The core and comprehensive trans-European network for roads, other motorways and sections of primary roads, where the total annual average daily traffic is more than 8 500 vehicles, and all roads in the cities at the centre of each Urban Node (if applicable limited to > 7 000 vehicles/day)*	traffic circulations plans*	*0 %*	

Subcategory: - permanent access restrictions	*The core and comprehensive trans-European network for roads, other motorways and sections of primary roads, where the total annual average daily traffic is more than 8 500 vehicles, and all roads in the cities at the centre of each Urban Node (if applicable limited to > 7 000 vehicles/day)*	permanent access restrictions*	*0 %*	
Subcategory: - boundaries of restrictions, prohibitions or obligations with zonal validity, current access status and conditions for circulation in regulated traffic zones	*The core and comprehensive trans-European network for roads, other motorways and sections of primary roads, where the total annual average daily traffic is more than 8 500 vehicles, and all roads in the cities at the centre of each Urban Node (if applicable limited to > 7 000 vehicles/day)*	boundaries of restrictions, prohibitions or obligations with zonal validity, current access status and conditions for circulation in regulated traffic zones*	*0 %*	
1.2 Types of data on the state of the network:				
Subcategory: - road closures - lane closures - roadworks	*The trans-European core network for roads*	road closures**	*100 %*	
		lane closures**	*100 %*	
		roadworks**	*100 %*	
	The comprehensive trans-European network for roads	road closures**	*100 %*	
		lane closures**	*100 %*	
		roadworks**	*100 %*	

Subcategory: - temporary traffic management measures	*The trans-European core and comprehensive network for roads*	temporary traffic management measures**	*100 %*	

2.5.2. Data relating to information and reservation services for safe and secure parking places for trucks and commercial vehicles

Data type	Geographical coverage	% of parking places for which data are available		Comments
2. Data relating to information and reservation services for safe and secure parking places for trucks and commercial vehicles:				
Category: static data *Subcategory:* - static data related to the parking areas - information on safety and equipment of the parking area	*The trans-European core network for roads*	static data related to the parking areas	*0%*	*A lot of the information is avaliable and will be uploaded in the future.*
		information on safety and equipment of the parking area	*0%*	*A lot of the information is avaliable and will be uploaded in the future.*
	The comprehensive trans-European network for roads	static data related to the parking areas	*0%*	*A lot of the information is*

				avaliable and will be uploaded in the future.
		information on safety and equipment of the parking area	*0%*	*A lot of the information is avaliable and will be uploaded in the future.*
Category: dynamic data *Subcategory:* - dynamic data on availability of parking places including whether a parking is: full, closed or number of free places which are available.	*The trans-European core and comprehensive network for roads*	dynamic data on availability of parking places including whether a parking is: full, closed or number of free places which are available.	*0%*	*There are 4 parking places operated by the DRD with dynamic data. These will be uploaded in the future.*

2.5.3. Data on detected road safety-related events or conditions relating to road safety-related minimum universal traffic information

Data type	Geographical coverage	% of geographical scope where data type is available	Comments
3. Data on detected road safety-related events or conditions relating to road-safety-related minimum universal traffic information:			

Category: dynamic data *Subcategory:* - temporary slippery road - animal, people, obstacles, debris on the road - unprotected accident area - short-term roadworks - wrong-way driver - unmanaged blockage of a road	*The core and comprehensive trans-European network for roads and other motorways not included in that network*	temporary slippery road**	*100 %*	
		animal, people, obstacles, debris on the road**	*100 %*	
		unprotected accident area**	*100 %*	*Except for hard shoulders where DRD has decided not to inform about/share data*
		short-term road works**	*100 %*	
		wrong-way driver**	*100 %*	
		unmanaged blockage of a road**	*100 %*	
Subcategory: -reduced visibility - exceptional weather conditions	*The core and comprehensive trans-European network for roads and other motorways not included in that network*	reduced visibility**	*100 %*	*The data availability for this subcategory is, however, limited*
		exceptional weather conditions**	*100 %*	

2.5.4. Static multimodal traffic data for EU-wide multimodal travel information services

**** Where possible, provide figures per scheduled transport mode, referred to in the Annex to Delegated Regulation (EU) 2017/1926 (such as air, rail including high-speed rail, conventional rail, light rail, cableways, long-distance coach, maritime including ferry, inland waterways, metro, tram, bus, trolley-bus)*

Data type	Geographical coverage	% of nodes where data are available for the scheduled transport mode		Comments
4. Static multimodal traffic data for EU-wide multimodal travel information services:				
Category Location of identified access nodes for all scheduled modes, including information on accessibility of access nodes and paths within an interchange (such as existence of lifts, escalators)	*Urban nodes as defined in Article 3, point (p), of Regulation (EU) No 1315/2013 and listed in that Regulation, including those administered by the cities*	Location of identified access nodes for all scheduled modes, including information on accessibility of access nodes and paths within an interchange (such as existence of lifts, escalators)***	25 %	Only includes access nodes where accessibility facilities may be present (not regular bus stops).

	The entire transport network of the Union	Location of identified access nodes for all scheduled modes, including information on accessibility of access nodes and paths within an interchange (such as existence of lifts, escalators)***	50 %	Only includes access nodes where accessibility facilities may be present (not regular bus stops)

2.6. Availability of services listed in Annex IV to Directive 2010/40/EU

2.6.1. Road safety-related minimum universal traffic information services

Service	Geographical coverage	% geographical scope covered
Road safety-related minimum universal traffic information (SRTI) service	The ***core and comprehensive*** trans-European network for roads	100 %

2.7. Other initiatives / highlights

2.7.1. Description of other national initiatives / highlights and projects not covered in priority areas 1 to 4:

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

N.A.

2.7.2. Progress since 2023

Description of progress in the area since 2023l:

N.A.

3. KEY PERFORMANCE INDICATORS (KPIS)

All the KPIs in this report are, unless otherwise stated, calculated based on the Comprehensive Ten-T Road network in Denmark which covers 1555 km. Further, the KPIs are in most cases also reported for the state road network which covers the Comprehensive Ten-T Road network plus the main roads in Denmark (length is 3826 km in the end of 2024).

To have comparable data regarding deployment KPIs for the future, all numbers are based on values from the end of 2024.

For the benefit KPIs it has not been possible to extract and generate the necessary data to calculate the KPIs for this reporting period.

3.1. Deployment KPIs

3.1.1. Information-gathering infrastructures / equipment (road KPI)

Figures to be provided by type of network.

Figures to be provided by type of services, and where relevant by distinguishing between fixed and mobile equipment.

KPIs to be calculated by type of network.

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

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

This KPI has been calculated in relation to larger systems where numerous detectors are connected over a given stretch of road. This in practice means that this KPI is identical to the one in section 3.1.3 (Traffic management and traffic control measures) except for the KPI for mobile/probe traffic monitoring.

The KPI is based on the length (coverage) of the motorway systems that are listed in annex 3 plus tunnel control systems. This will however not necessarily be the case in the future since it is possible to have larger systems to gather data but not including traffic management and traffic control measures such as VMS.

- KPI for road network equipped with road weather monitoring (comprehensive Ten-T Road network):
  1555 km/1555 km*100% = 100%

- KPI for road network equipped with road weather monitoring on the state road network (state road network):
  3826 km/3826 km*100% = 100%

- KPI for road network equipped with permanent fixed traffic monitoring (comprehensive Ten-T Road network):
  (117+22,4) km/1555 km*100% = 9%

- KPI for road network equipped with temporary fixed traffic monitoring (comprehensive Ten-T Road network):
  0 km/1555 km*100% = 0%

- KPI for road network equipped with mobile/probe traffic monitoring (comprehensive Ten-T Road network):
  0 km/1555 km*100% = 0%

  Note: This KPI was 100% in the last ITS progress report. However, DRD does no longer buy real-time probe traffic data and hence during 2024 this KPI has changed. DRD is still buying such data for planning purposes, but not in real-time.

- KPI for road network equipped with mobile/probe traffic monitoring (state road network):

  0 km/3826 km*100% = 0% (same note as above)

3.1.2. Incident detection (road KPI)

Figures to be provided by type of network.

KPI to be calculated by type of network.

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

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

In Denmark, automatic incident detection (AID) on the comprehensive Ten-T Road network is established in several motorway tunnels: The Limfjord Tunnel (0.6 km), the Øresund Tunnel (4 km), the Silkeborg Tunnel (0.3 km), the Tårnby Tunnel (0.7 km) and as well at the hard shoulder running stretch of the M13 motorway (2 km). This equals in total an approximate length of AID equipped road of 7.6 km.

The total length of (motorway) tunnels on the comprehensive Ten-T Road network is 6.1 km (see annex 2).

- KPI for Automatic Incident detection on the comprehensive Ten-T Road network
  7.6 km/1555 km*100% = 0.5%

- KPI for Automatic Incident detection in tunnels (comprehensive Ten-T Road network)
  (0.6 km + 4 km + 0.3 km + 0.7 km)/6.1 km * 100% = 92%

- KPI for manual incident detection (comprehensive Ten-T Road network)
  1555 km/1555 km*100% = 100%

- KPI for manual incident detection (state road network)
  3826 km/3826 km*100% = 100%

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

Figures to be provided by type of network.

KPI to be calculated by type of network.

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

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

In Denmark, all tunnels on the Ten-T Road network are equipped with tunnel control systems (meaning a KPI on 100% for tunnels). Regarding larger ITS systems on the comprehensive Ten-T Road network a list of ITS systems on motorways can be found in Annex 3.

- KPI for traffic management and traffic control systems (incl. tunnel control) on the comprehensive Ten-T Road network
  (117+22,4) km/1555 km*100% = 9%

- KPI for traffic management and control measures in tunnels (comprehensive Ten-T Road network)
  6.1 km/6.1 km * 100% = 100% (in tunnels)
  22.4 km/22.4 km * 100% = 100% (motorway segments leading to tunnels inkl. the tunnels)

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

Figures to be provided by type of network.

KPI to be calculated by type of network.

- Length of road network type / road sections (in km) covered by C-ITS services or applications and the 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

In Denmark, there are no C-ITS services or applications available on a permanent basis.

- KPI for C-ITS services or applications = 0%

However, refer to section 2.4.1 for C-ITS pilot testing

3.1.5. Real-time traffic information (road KPI)

Figures to be provided by type of network.

KPI to be calculated by type of network.

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

- KPI = (kilometres of road network type with provision of real-time traffic information services / total kilometres of same road network type) x 100

Real-time traffic information can be obtained for the entire comprehensive Ten-T Road network through the Danish NAP or via road user services like the traffic map or other channels. The map can be seen at https://trafikkort.vejdirektoratet.dk/

- KPI for real-time traffic information (comprehensive Ten-T Road network)
  1555 km/1555 km*100% = 100%

- KPI for real-time traffic information (state road network)
  3826 km/3826 km*100% = 100%

3.1.6. Dynamic travel information (multimodal KPI)

Figures to be provided by type of network / node.

KPI to be calculated by type of network / node (where relevant); 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 and total length of this same transport network type (in km):

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

- KPI = (kilometres of transport network type with provision of dynamic travel information services / total kilometres of same transport network type) x 100

- KPI = (number of transport nodes with provision of dynamic travel information services / total number of same transport nodes) x 100

Concerning the total length of the transport network, this difficult to calculate since it is unclear what should be included, for example should a railway running along a motorway be counted by itself or should it be considered as the same network as the motorway? Should a bus line running along a motorway corridor, but on twisting rural roads through the cities along the motorway be counted by itself or as the same corridor?

For this reason the length of the transport network included has been set to 1555 km which is the length of the Ten-T comprehensive road network, but It should be understood that this is meant to cover also the railways and bus routes covering the same areas (the Ten-T comprehensive rail network in Denmark does to a large degree follow the road network as can be seen in Annex 4).

In Denmark, a national journey planner, www.rejseplanen.dk (EN: www.journeyplanner.dk), has been in operation for several years. Rejseplanen.dk includes travel information about several modes: Train, metro, bus, domestic flight, taxi services, cycling and walking in all of Denmark.

Within this travel planner it is possible for all operators to update with real time information such as delays, planned and unplanned changes in time plan, specific information such as demands for seat reservations etc., and based on these technical possibilities the KPI has been set to 100% for the comprehensive TEN-T network (road, rail and bus). It should however be understood that the amount of actual dynamic travel information in the planner depends among others on the routes and bus lines etc., and that the KPI on 100% therefore doesn't mean that all delays etc. on the covered network is reported to the journey planner. An estimate for the KPI based on where dynamic information is provided is for the moment very difficult to calculate, among others because of unclear definitions on the criteria needed to decide whether to include a route or not.

Due to the above-mentioned challenges in determining the exact area where relevant nodes (e.g., rail or bus stations) should be included the below number of nodes include all of Denmark, but since the KPI is 100% the KPI would be the same no matter which area is chosen.

- KPI for dynamic travel information (comprehensive Ten-T network (road, rail, bus))
  1555 km/1555 km*100% = 100%

Number of transport nodes (e.g., rail or bus stations) with provision of dynamic travel information services: approx. 37 500

- KPI for Denmark 37 500/ 37 500*100% = 100%

3.1.7 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.

- 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):

- Number of freight nodes (e.g. ports, logistics platforms) covered by freight information services & Total number of the same freight nodes:

- KPI = (kilometres of road network type with provision of freight information services / total kilometres of same road network type) x 100

- KPI = (number of freight nodes with provision of freight information services / total number of same freight nodes) x 100

The generic information services offered on the internet, mobile applications and roadside VMSs are also used by freight operators, but beside this there are dedicated services as for example functionalities incorporated on the traffic map developed by DRD where information such as bridge heights, weight limits etc. can be shown for the entire Ten-T Road network. Based on this, the KPI has been set to 100%

The map can be seen at https://trafikkort.vejdirektoratet.dk/

- KPI for freight information (comprehensive Ten-T network (Road KPI))
  1555 km/1555 km*100% = 100%

Number of freight nodes cannot be calculated at present.

3.2. Benefit KPIs

For benefit KPIs it has unfortunately not been possible to extract and generate the necessary data to calculate the KPIs in relation to this reporting period.

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

3.2.2. Change in the number of road crashes resulting in deaths or injuries (road KPI)

If possible, a distinction can be made between crashes resulting in deaths, serious injuries or slight injuries.

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

- Number of road crashes resulting in deaths or injuries before ITS implementation or improvement:

- Number of road crashes resulting in deaths or injuries after ITS implementation or improvement:

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

Please specify routes / areas where ITS has been implemented or improved. The length along or area within which the change in CO2 emissions is calculated shall be long or wide enough to be representative.

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

3.3. Financial KPIs

ITS includes any types of systems and services together.

Annual public* investment in road ITS (as % of total transport infrastructure investments):

Annual public* operating and maintenance costs of road ITS (in euro per kilometre of network covered):

** public administrations or publicly-owned entities*

Where possible, please provide the same figures for private investments and costs.

The KPI on annual investment in road ITS (as a % of total transport infrastructure investments) cannot be calculated in a meaningful way for the reporting period.

Regarding the KPI on annual operating & maintenance costs of road ITS, this is also difficult to calculate due to lack of precise definitions. As an example, how many kilometres are covered by a VMS sign, how do you divide the maintenance cost of a backbone IT system when it covers different types of systems etc. For this reason, the KPI will be estimated as a rough estimate.

In annex 3 an estimate of operating & maintenance costs for the relevant roadside based systems are given (systems marked with N.A. is excluded since the operating & maintenance costs of these systems are covered by separate companies and includes tolling systems). This gives a total of 2,64 mill. € pr. year for 73 km of roadside based ITS systems, which gives a rough estimate of a KPI around 35 000 €/km/year.

ANNEX II

Key performance indicators (KPIs)

	KPI name	Geographical scope	Timeline
Deployment KPIs	Information-gathering infrastructures / equipment (road KPI)	Core, extended and comprehensive TEN-T (without urban nodes) + motorways	Mandatory in 2025
		Urban nodes from TEN-T + primary roads	Mandatory in 2028 (voluntary before)
		Entire road network	Additional KPI to be provided on voluntary basis
	Incident detection (road KPI)	Core, extended and comprehensive TEN-T (without urban nodes) + motorways	Mandatory in 2025
		Urban nodes from TEN-T + primary roads	Mandatory in 2028 (voluntary before)
		Entire road network	Additional KPI to be provided on voluntary basis
	Traffic management and traffic control measures (road KPI)	Core, extended and comprehensive TEN-T (without urban nodes) + motorways	Mandatory in 2025
		Urban nodes from TEN-T + primary roads	Mandatory in 2028 (voluntary before)
		Entire road network	Additional KPI to be provided on voluntary basis
	Cooperative-ITS services and applications (road KPI)	Core, extended and comprehensive TEN-T (without urban nodes) + motorways	Mandatory in 2025
		Urban nodes from TEN-T + primary roads	Mandatory in 2028 (voluntary before)
		Entire road network	Additional KPI to be provided on voluntary basis
	Real-time traffic information (road KPI)	Core, extended and comprehensive TEN-T (without urban nodes) + motorways	Mandatory in 2025
		Urban nodes from TEN-T + primary roads	Mandatory in 2028 (voluntary before)
		Entire road network	Additional KPI to be provided on voluntary basis

	Dynamic travel information (multimodal KPI)	Core, extended and comprehensive TEN-T (without urban nodes) + motorways	Mandatory in 2025
		Urban nodes from TEN-T + transport nodes + primary roads	Mandatory in 2028 (voluntary before)
		Entire transport network	Additional KPI to be provided on voluntary basis
	Freight information (multimodal if possible or road KPI)	Core, extended and comprehensive TEN-T (without urban nodes) + motorways	Mandatory in 2025
		Urban nodes from TEN-T + transport nodes + primary roads	Mandatory in 2028 (voluntary before)
		Entire transport network	Additional KPI to be provided on voluntary basis
Benefit KPIs	Change in travel time (road KPI)	Core, extended and comprehensive TEN-T + motorways	Mandatory in 2028 (voluntary before)
	Change in the number of road crashes resulting in deaths or injuries (road KPI)	Core, extended and comprehensive TEN-T + motorways	Mandatory in 2028 (voluntary before)
	Changes in traffic-CO2 emissions (road KPI)	Core, extended and comprehensive TEN-T + motorways	Mandatory in 2028 (voluntary before)
Financial KPIs	Annual public investment in road ITS *(+ figures for private investments where possible)*	Core, extended and comprehensive TEN-T (without urban nodes) + motorways	Mandatory in 2025
		Urban nodes from TEN-T + primary roads	Mandatory in 2028 (voluntary before)
		Entire road network	Additional KPI to be provided on voluntary basis
	Annual public operating and maintenance costs of road ITS *(+ figures for private costs where possible)*	Core, extended and comprehensive TEN-T (without urban nodes) + motorways	Mandatory in 2025
		Urban nodes from TEN-T + primary roads	Mandatory in 2028 (voluntary before)
		Entire road network	Additional KPI to be provided on voluntary basis

Annex 1: Status of ITS Systems and Traffic Management

This Annex contains a status of all the ITS projects/systems described in the last report (from 2023).

Traffic management, information, and bridge tolling at The Øresund Link, E20, between Sweden and Denmark

No major changes have been carried out or are foreseen in the near future.

Traffic information and management at the Motorring 3, M3/E47/E55, around Copenhagen

No major changes have been carried out or are foreseen in the near future.

Traffic management, information, and bridge tolling at The Storebælt fixed link, E20.

No major changes have been carried out or are foreseen in the near future.

Traffic information and warning systems in the Triangle Area, E20/E45

No major changes have been carried out or are foreseen in the near future.

Traffic management and information at the motorway tunnel (E45) across the inlet Limfjorden and through the City of Aalborg

No major changes have been carried out or are foreseen in the near future.

Traffic management and information at the Guldborgsund Motorway tunnel, E47

No major changes have been carried out or are foreseen in the near future.

Dynamic Hard shoulder running on the Hillerød motorway, M13, for driving in the morning rush hour

No major changes have been carried out or are foreseen in the near future.

Traffic management M40/E20 (Middelfart – Nørre Åby)

No major changes have been carried out or are foreseen in the near future.

M60/E45 Vejlefjord

No major changes have been carried out or are foreseen in the near future.

M60/E45 Skanderborg

No major changes have been carried out or are foreseen in the near future.

M40/E20 Odense

No major changes have been carried out or are foreseen in the near future.

Annex 2: Length of relevant road network in Denmark

1.1. Relevant Road length in km

Member State	**Total road network** (i.e., only paved roads) (a)	**Total Motorways** (b)	**Comprehensive trans-European road network** (i.e., core and non-core road network) (c)	**Motorways** (i.e., only those **not included** in the comprehensive trans-European road network) (d)	**Priority zones** (i.e., according to the definition of each country) (e)	**Total road network covered by Delegated Regulation 2015/962** (f)=(c+d+e)	**State road network**
DK	74.852	1.298	1.555	123	-	1.678	3.826

1.2. Length of tunnels on the Comprehensive Ten-T network

Tunnels on Comprehensive Ten-T Road network	**Length (km)**	**Automatic Incident Detection (km)**	**ITS influenced (km)**
Øresundstunnelen	4	4	5,0
Tårnbytunnelen	0,7	0,7	6,1
Silkeborgtunnelen	0,3	0,3	2,4
Limfjordstunnelen	0,6	0,6	6,4
Guldborgsundtunnelen	0,5	0	2,5
Total	**6,1**	**5,6**	**22,4**

Annex 3: Length of relevant ITS systems described in the earlier 2020 and 2023 reports.

	Permanent motorway system end 2024 (km)	Temporary motorway system end 2024 (km)	Approx. operation and maintenance cost (Million € pr. Year)
Traffic management, information and bridge tolling at "The Øresund Link" E20 between Sweden and Denmark	24		N.A.
Traffic information and management at the Motorring 3, M3/E47/E55, around Copenhagen	17		1
Traffic management, information and bridge tolling at The Storebælt fixed link E20.	20		N.A.
Traffic management and information at the motorway tunnel E45 across the inlet Limfjorden and at the City of Aalborg	11		0,6
Traffic management and information at the Guldborgsund Motorway tunnel E47	11		0,3
Hard shoulder running on the Hillerød motorway, M13	2		0,1
M40/E20 Middelfart – Nørre Åby	10		0,1
Traffic management and information at M60/E45 Vejlefjord	20		0,5
Traffic management and information at M60/E45 Skanderborg	1		0,02
Traffic management and information at M40/E20 Odense	1		0,02
Total (km)	117	0	2,64

In addition to the motorway systems, there is appr. 2.5 km of main roads with socalled "ITS at school roads" (7 different school access roads with speed reduction when the school is open).