



**An Roinn Iompair  
Turasóireachta agus Spóirt**

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**Department of Transport,  
Tourism and Sport**

# Article 17(3) of Directive 2010/40/EU 2<sup>nd</sup> Progress Report for Ireland

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August 2017

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## 1 Introduction

This report has been prepared by the Department of Transport, Tourism and Sport (DTTAS) taking input for the various projects and initiatives from national authorities, including Transport Infrastructure Ireland (TII, formerly the National Roads Authority), National Transport Authority (NTA), and from local authorities.

The operation and management of the public road network in Ireland is the responsibility of a number of state organisations that comprises Transport Infrastructure Ireland (TII) and the various Local Authorities (LA). TII operate and manage the National Primary and Secondary road network which accounts for 5,306 km on the network, this represents about 6% of the network, and carries approximately 45% of the country's total road traffic, most of Ireland's freight is distributed by road. The rest is operated and managed by the LAs for their respective regional and local road networks, these account for about 94,807 km or 94% of the network

### 1.1 General progress since 2014

Progress in the period 2014 to 2017 is discussed, in general, under the thematic headings below.

#### 1.1.1 National ITS Strategy

Collection of information and analysis on ITS deployment for the 2014 Article 17.3 ITS Directive Member State report to the EU Commission challenged Ireland with regard to ITS Policy. It reflected very well the point made in the EU Commission Action Plan for the Deployment of Intelligent Transport Systems in Europe 2008 about patchworks rather than networks.

During late 2014 and throughout 2015, Ireland undertook drafting a National ITS Strategy. It became apparent early in 2016 that the scope of ITS had expanded to include C-ITS and a rapid move to developing connected and automated driving. It was decided that any National ITS Strategy must include these areas. In the second half of 2017, policy in all these areas has been developed at an EU level and further domestic work has been undertaken with regard to a connected and automated vehicles forum. It is now opportune to recommence drafting a National ITS Strategy for Ireland. It is also opportune for Ireland to be an associate member of the C-Roads Platform. All of the implemented EU ITS and C-ITS initiatives will inform Ireland's National ITS Strategy.

The revision of the draft National ITS Strategy is being prepared together with the Greater Dublin Area ITS Strategy being developed by the NTA and a National ITS Architecture, being developed by TII.

#### 1.1.2 Open Data

This important initiative, in line with the eGov Strategy 2012 and the Re-Use of Public Sector Information Directive 2003, was included in the 2014 Progress Report and has continued to be developed and expanded throughout the 2014 to 2017 period. The initial [www.Dublinked.ie](http://www.Dublinked.ie) portal, focusing on information supplied by the four local authorities and the National Transport Authority in the Greater Dublin Area. This has been greatly enhanced by the National Access Point [data.gov.ie](http://data.gov.ie) and other portals such as [data.tii.ie](http://data.tii.ie).

The National Access Point (NAP) has been facilitated through Ireland's Open Data Portal. The site has a Transport section and a number of contributors. Of direct relevance to ITS is data from Transport Infrastructure Ireland (TII), National Transport Authority (NTA) and local authorities. The Central Statistics Office is also populating the Portal with information relating to travel and transport gleaned from the national Census in 2016. Discussions have taken place with the National Standards Authority of Ireland (NSAI) with regard to them fulfilling the role of Competence Assessment Body for the various Priority Action Regulations made under the delegated authority contained in the ITS Directive. It is hoped that the Quality Benchmarking Report prepared under an EU EIP sub-activity will assist the NSAI with their work as well as creating a harmonised framework for this work within the EU.

In the 2014 to 2017 period, organisations have been examining and cataloguing the information that they collect to increase the amount of data that can be published on-line, these actions will facilitate better use of their data

and information. There has been a focus on the use of data to create information and data services and products that offers tangible benefits to citizens and other organisations.

The focus of the Open Data projects include:

- Creation of new data sources;
- Creation of new data services;
- Linking data sources between existing systems;
- Creation of datastores and publishing data in Open Data Portals; and
- Utilising connectivity.

### 1.1.3 General Progress on ITS

Funds for capital investment in ITS have been particularly scarce in the years 2014 to 2017. TII have been constructing the Luas Cross City light rail project to connect the existing Luas lines in Dublin. As part of this project they have been active in improving the technology employed in control, stations and rolling stock. TII have developed protocols to allow for the provision of traffic data (including VMS settings and travel times) to the NAP. The NTA are engaging in a project under the CEF to develop a Nettex formatted dataset for public transport data which will be made available through the NAP. They have also been active in developing the Public Transport and Cycle Journey Planner systems and integrating their Dynamic Travel Information. The four local authorities in the Dublin Region, DCC, SDCC, DLRCC, and FCC, have been working on traffic management/control systems and cooperating in this area and deploying a sophisticated centralised bus priority system for the Dublin area.

Other regional authorities, e.g. KCC, CCC, GCC, and LC&CC have also all been working on expanding their ITS communications network and traffic management/control systems in their areas. The Electricity Supply Board (ESB) has been expanding charging points to facilitate the eCar initiative. The Local Government Management Agency (LGMA) has developed and is continuing to work on Road-works Management and Road Asset Management systems for all 31 local authorities in the country. Mobile apps have been developed to support the data gathering exercise on pavements. A Road Management Office has been set up as a shared service to provide support to the sector in the area of best practice, guidelines and policy.

Underpinning all of this work, the Department of Transport, Tourism and Sport has provided funding and supported policy with the national agencies and local authorities.

### 1.1.4 Irelands' involvement in EU Projects

#### **I\_HeEro/eCall**

Ireland has taken part in an EU Commission supported programme I\_HeERO funded through ERTICO. The purpose of this programme is to upgrade all Public Service Answering Points (PSAP) or Emergency Call Answering Service in Ireland to deal with eCall. The upgrade of the PSAPs in Ireland has been undertaken by the Department of Communications, Climate Action and Environment who have overall responsibility for the Emergency Call Answering Service in Ireland. Ireland will be fully ready to implement eCall with effect from 31st March 2018 as required by the ITS Regulations.

#### **Arc Atlantique**

Transport Infrastructure Ireland (TII) has participated in Arc Atlantique since 2014. The main objective of the project is to improve interoperability on the main road routes that interconnect the various member states (Ireland, UK, Netherlands, Belgium, France, Spain and Portugal) along the Arc Atlantique Corridor. Such improvements are focussed on the deployment of ITS systems that both deliver an enhanced service and share data/information with relevant stakeholders.

There have been three planned phases for Arc Atlantique. Ireland has contributed in the following manner:

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- Arc Atlantique I (2014-2015) – the deployment of a network of Bluetooth Readers on the N7 corridor to calculate and deliver a travel time information service for network monitoring by the MTCC. It is planned to disseminate the travel time data through VMS and web services in the future.
- Arc Atlantique II (2015 -2017) – the deployment of:
  - 8 x VMS on the Major Inter Urban network – M7 and M17/M6 at strategic locations - to be completed -;
  - 6 x VMS in Dun Laoghaire Rathdown County (N11, N31 etc) - for provision of safety related and incident information as part of the urban/inter-urban interface; 1 x Lane Control Sign on the N7 approach to the M50 at Newlands Cross.

Arc Atlantique has provided an important programme to not only offer funding opportunities for ITS projects in Ireland, but also facilitate dialogue and learning opportunities with other Member States.

### **EU TEN-T**

Two EU TEN-T funded projects, completed in December 2015, were incorporated into deployments on the network:

- International Green Electric Highways, 2011-EU-92145-S A Study to assess fast charging infrastructure to enable deployment of electric vehicles in Ireland and Northern Ireland; and
- Rapid Charge Network, 2012-EU-13066-S Accelerating the introduction of Electric Vehicle Rapid Charging by studying adoption and use along PP axes 13 and 26 in the UK and Ireland.

### **TN-ITS Project - Provision of updates of ITS Spatial Road Data - Road Network Management in Ireland**

All Local Authorities use a centrally managed Pavement Management System (PMS). Management and coordination of the platform is handled through the Local Government Management Agency (LGMA) on behalf of all local authorities. An upgrade to the PMS will facilitate local authorities to provide live updates to the centralised system. It is also backed onto the Ordnance Survey Ireland Prime 2 spatial data storage model which is designed as the authoritative spatial reference framework for Ireland.

The Irish Pilot study has been implemented using 10,551 km of road network data sourced from three different road network data platforms/providers:

- TEN-T National Core Network - provided by Transport Infrastructure Ireland;
- Galway County Network - available from Galway County Council Open Data Portal; and
- Monaghan County Network - provided by Monaghan County Council through the Local Government Management Agency.

A number of recommendations arose from the pilot project including:

- Possibility for further development of Maynooth University prototype tool with OSI;
- To explore the use of existing/new digital platform;
- To enable capturing/reporting static road network change;
- To consider future route-corridor transportation data/information services requirements not only for static road network data but also dynamic road network data. This will have implications not only for contemporary ITS but also for CAV, Smart Cities, Climate Change Adaptation etc.

### **C-Roads**

Ireland has joined the C-Roads Platform as an associate member. Ireland sees this as a more long-term project from a national point of view. It will hopefully allow Ireland to benefit from the experience of more advanced Member States and to look forward to deploying and implementing appropriate technology among other things, which is harmonised as well as mature. The C-Roads Platform has the potential to help Ireland model ITS and C-ITS deployment which has demonstrated benefits for challenges such as congestion.

The Department of Transport, Tourism and Sport is responsible for the activities of the government authorities and agencies, whose activities are captured in this report. There are also a large number of other organisations and institutions in Ireland that are progressing the concepts and ideas of Intelligent Transport Systems for their own purposes and benefits. There is a rich technology focused ecosystem in Ireland (including companies like Google, IBM, Dell and universities such as Trinity College Dublin, University College Dublin, Maynooth University, Blanchardstown Institute of Technology, etc.) that is focusing on the research and delivery of ITS services. These research and development initiatives are often facilitated by, or undertaken in collaboration with, DTTAS or its authorities to progress these concepts with a view to future activities and deployments.

## 1.2 Contact information

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## 2 Projects, Activities and Initiatives

### 2.1 Priority area I. *Optimal use of road, traffic and travel data*

Funds for investment in ITS have been particularly scarce in the years 2014 to 2017. This has seen minimal deployment of new devices and capital projects. However, while there has been a lack of capital investment, this has allowed space for innovation and invention for organisations to examine their offerings and to hone and tailor their existing systems to offer benefits and new products. In particular there has been significant progress on the gathering, cataloguing, collation, sharing and publication of Traffic and Transport Data since 2014.

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

Project/Activities	Description
DATEX II roll out	<p><b>Partners:</b> DTTAS, TII, NTA</p> <p>Following the initial rollout of DATEX II (the European traffic data exchange protocol) as a national standard for the provision and exchange of traffic data between third parties, this has continued to be applied as the data transfer protocol to new projects.</p> <p><b>Status:</b> Completed, operational for existing data transfer operations, ongoing for new data exchanges with third parties</p>
OPEN DATA / SmartCities	<p><b>Partners:</b> DTTAS, TII, NTA, Local Authorities <b>Site:</b> <a href="http://www.Dublinked.ie">www.Dublinked.ie</a>, <a href="http://data.gov.ie">data.gov.ie</a>, <a href="http://data.tii.ie">data.tii.ie</a>, <a href="http://www.corkparking.ie">www.corkparking.ie</a></p> <p>This important initiative, in line with the eGov Strategy 2012 and the Re-Use of Public Sector Information Directive 2003, included in the 2014 Progress Report has continued to be developed and expanded throughout the 2014 to 2017 period. The initial portal (207 Data Sets, 60 transport), focusing on information supplied by the four local authorities and the National Transport Authority in the Greater Dublin Area, has been supplemented by a national open data portal <a href="http://data.gov.ie">data.gov.ie</a> (5328 data sets, 349 transport) and other portals such as <a href="http://data.tii.ie">data.tii.ie</a> (25 data sets).</p> <p>Public Sector organisations are examining and cataloguing the information they collect to increase the amount of data that can be published online.</p> <p>Organisations such as TII now provide portals to their own data stores to publish multiple datasets in areas such as Intelligent Transport Systems, Road Safety, Light Rail, Network Operations and Traffic Data.</p> <p>Local authorities are engaging in actively opening up their data such as Cork City Council, in collaboration with Cork Institute of Technology, have provided access to real-time data on the availability of parking in the multi-storey car parks and Park'n'Ride facilities. The data can be accessed via <a href="http://www.corkparking.ie">www.corkparking.ie</a> on the Cork Smart Gateway at <a href="http://data.corkcity.ie/dataset/parking">data.corkcity.ie/dataset/parking</a> in addition to other datasets.</p> <p>The datasets are shared across multiple portals allowing easy access to the data.</p> <p><b>Status:</b> Complete, operational, being developed</p>
Road Asset Management	<p><b>Partners:</b> DTTAS, LGMA, Local Authorities</p>



Project/Activities	Description
	<p>The Road Asset Management project was set up to develop a central online road asset database in the State utilising GIS. The system is used to record planned works on the local and regional road network and mobile apps complement the exercise of data gathering for surface inventory and condition rating.</p> <p>As part of the latest release of the GIS system, local authorities are carrying out an exercise to ensure the road schedule is up to date in terms of location and recording what is taken in charge by the authority. This dataset is now linked to the Ordnance Survey of Ireland's core dataset for road centrelines. Planned and completed road improvements and maintenance are recorded on the system. Local authorities also collect information on special speed limits as well as locations for speed limit signage.</p> <p><b>Status:</b> Complete, operational, and being developed</p>
Roadworks Management	<p><b>Partners:</b> DTTAS, LGMA, Local Authorities</p> <p>This provided/developed a central online road works registration/licensing and monitoring system in the State utilising GIS linked to the Road Asset Management project.</p> <p>The system is now centrally hosted and in use for the 31 local authorities and TII. Mobile Apps have been developed to support the data-gathering exercise on pavements.</p> <p>A Road Management Office has been set up as a shared service to provide support to the sector in the areas of best-practice, guidelines and policy.</p> <p><b>Status:</b> Complete, operational, and being developed</p>
Public Transport Route maps	<p><b>Partners:</b> NTA <b>Site:</b> <a href="http://www.transportforireland.ie">www.transportforireland.ie</a></p> <p>This online mapping service, hosted on the Transport for Ireland website, displays maps of all public transport services in Ireland on a dynamic map. This service is integrated with Journey Planners and Dynamic Travel Information.</p> <p><b>Status:</b> Completed, operational.</p>
Regional Cycle Journey Planner (Cycle Route Planner)	<p><b>Partners:</b> NTA <b>Site:</b> <a href="http://www.journeyplanner.transportforireland.ie/cp">www.journeyplanner.transportforireland.ie/cp</a></p> <p>This door-to-door cycle journey planning service is provided through the internet and mobile services. The Cycle Journey Planner features user preferences around gradient, directness and traffic regime. Walking is also included.</p> <p>This project integrates with the existing Real-Time Passenger Information service for real-time journey planning where appropriate.</p> <p><b>Status:</b> Complete, operational, being developed</p>
Real-Time Passenger Information (RTPI)	<p><b>Partners:</b> NTA, DCC, Bus Eireann, Dublin Bus</p> <p>Automatic Vehicle Locating System (AVLS) captures the location of buses and communicates this wirelessly to the central AVLS server in DCC. This data is then converted to meaningful information displayed on On-Street Displays. Electronic signs showing the bus arrival times are being installed</p>

Project/Activities	Description
	<p>at bus stops across metropolitan areas, and larger display units at key interchange railway stations.</p> <p>A total of 704 RTPI signs are now operational in the Greater Dublin Area (GDA) and in the regional cities of Cork, Galway, Limerick and Waterford. 290 rail and light rail stations have been provided with real-time displays.</p> <p><b>Status:</b> Completed, operational.</p>
Real-Time Journey Information	<p><b>Partners:</b> TII, Local Authorities</p> <p>A number of projects have been undertaken by TII and a number of local authorities in separate projects to gather journey time information for traffic using the road network. These projects utilise a combination of technologies to gather data and create Real-Time Journey Information for segments of the road network.</p> <p>Much of this information is published on the various open data portals, such as data.gov.ie, and real-time data is provided to media and social media service for dissemination. Projects are underway to link compatible systems to increase the granularity of the data and to collate the publishing.</p> <p>The main technologies involved in these systems are Automatic Number Plate Recognition (ANPR) and Bluetooth detectors which provide journey time information on specific vehicles. Other projects, using radar and embedded inductive loops, are used to monitor traffic flows at specific points in the network which provide estimated journey time for a segment.</p> <p><b>Status:</b> Complete, operational, being developed</p>
Dynamic Travel Information	<p><b>Partners:</b> NTA and Translink (Northern Ireland) <b>Site:</b> <a href="http://www.journeyplanner.transportforireland.ie">www.journeyplanner.transportforireland.ie</a></p> <p>Door-to-door public transport journey planning service provided through the internet and mobile services.</p> <p>The National Intermodal Journey Planner has all island coverage and features information on journeys on buses, trams, trains, walking, taxis, and ferries to the islands. The planner includes information on all licenced/contracted surface public transport services operating on the island of Ireland.</p> <p>This planner integrates with the existing Real-Time Passenger Information service for real-time journey planning where appropriate.</p> <p><b>Status:</b> Complete, operational, being developed</p>
Improvements to Light Rail (Luas) RTPI	<p><b>Partners:</b> TII <b>Site:</b> <a href="http://m.luas.ie/live-info">m.luas.ie/live-info</a></p> <p>The Luas Travel Alert Module is part of the Luas Forecast System which manages the RTPI data for the Luas websites and applications,. This Module facilitates and automates communications in case of a Luas services disruption. The Luas Travel Alert Module which controls the messages issued via the Application and Website streams of RTPI was upgraded in 2016. This upgrade allows Luas to issue platform specific messages in case of service disruptions. This brings the information available on the websites and applications up to the level of the lineside passenger information displays.</p>

Project/Activities	Description
	<p>The Luas Travel Alert Module allows Luas personnel to:</p> <ul style="list-style-type: none"> <li>- Change the Line Status Messages;</li> <li>- Change the Platform Status Messages;</li> <li>- Turn On / Off the Platform RTP1 Data;</li> <li>- Change the Website Travel Update Page; and</li> <li>- Tweet up to date information from @Luas.</li> </ul> <p>When services are operating normally, all these channels send out a positive message i.e. Red Line services are operating normally/Green Line services are operating normally. When there is a service disruption, these channels are updated to send out an information message for the affected platforms and line. These messages are specific to the unique situation of the service disruption.</p> <p>95% of forecasts across all channels are within 1 minute of each other, which is within the design specification. Forecasts on the new LCC extension will be monitored for accuracy when the line enters into passenger service at the end of 2017.</p> <p><b>Status:</b> Complete, Operational</p>
<p>Leap Card Integrated Ticketing Project</p>	<p><b>Partners:</b> NTA <b>Site:</b> <a href="http://www.leapcard.ie">www.leapcard.ie</a></p> <p>A smart card based system that will provide a common payment method for users of the different providers of public transport (state owned and privately owned bus services, light rail, heavy rail) nationally. The scheme will interoperate with the National Public Services Card being issued by the Department of Social Protection to their clients with free travel entitlement to provide electronic recording of free travel journeys for revenue apportionment and service planning purposes. Functionality enhancements to the system are continually ongoing with recent enhancements including fare capping, second journey discounting, integration with public bikes scheme and inclusion of special fares for specific groups. The new Leap Cards have a Near Field Communications interface to support the use of mobile phones to read Leap Cards and to top them up.</p> <p><b>Status:</b> Complete, operational, being developed</p>
<p>Ticket Vending Machine and Leap Card Advances</p>	<p><b>Partners:</b> TII, NTA</p> <p>A project is underway to migrate Debit/Credit payments at Luas TVMs to a Point-To-Point Encryption (P2PE) Payment Card Industry Data Security Standard (PCI-DSS) solution. This solution increases the security of customer data by encrypting it at the pin pad and decrypting it at the bank. This solution also allows for the introduction of contactless payment. A project has been completed allowing Luas customers to pay for their parking at Luas Ticket Vending Machines. Payment was previously made at dedicated Pay by Bay machines. This change has allowed the Luas Park and Ride Operator to roll out a system of parking validation based on automatic number plate reading. An application for Android Smart Phones has been released by the NTA in a project part funded by TII and other Irish Transport Operators allowing customers to remotely check their Leap Card balance, top up their Leap Card or purchase tickets online.</p>

Project/Activities	Description
	<b>Status:</b> Ongoing
Mobile Parking Payments	<p><b>Partners:</b> Local Authorities</p> <p>Similar to the TVM and Leap Card developments, a number of authorities have employed mobile parking payment services to facilitate cashless payment by users.</p> <p>These systems utilise mobile technology to allow users to purchase, or top-up, parking permits either by phone or with a smartphone application. All on-street parking spaces within the Dublin and Limerick metropolitan area are payable via e-parking. Limerick has also included a number of off-street parking spaces within the system. They also provide a pre-booking facility for motorists to book and pay for parking in advance.</p> <p>These systems are supplemented by monitoring equipment utilised by wardens and enforcement officers.</p> <p><b>Status:</b> Complete, operational, and being developed</p>
Centralised Bus Priority System	<p><b>Partners:</b> NTA, DCC</p> <p><b>Site:</b>  <a href="http://www.dublincity.ie/sites/default/files/content/YourCouncil/StrategicPolicyCommitteeandCorporatePolicyGroup/Transport/ITS%20Bus%20Priority%20Presentation.pdf">http://www.dublincity.ie/sites/default/files/content/YourCouncil/StrategicPolicyCommitteeandCorporatePolicyGroup/Transport/ITS%20Bus%20Priority%20Presentation.pdf</a></p> <p>This project developed an interface between the AVLS from Dublin Bus and the SCATS Traffic Control System such that Bus priority at junctions and along key routes can be granted.</p> <p>DCC have designed, overseen the development and deployment of a centralised Bus priority system which integrates real-time data from the Dublin Bus fleet with the SCATS traffic control system. The objective has been reduction in travel times, sophisticated analysis of bus speeds and areas of congestion. Software has been enhanced and updated and use of a visualisation tool now enhances the transparency of the data and the how it can be displayed to multiple stakeholders. The use of Bus data for real-time intervention on traffic signals in the Dublin Area has been established and proven successful.</p> <p>This product is also being evaluated by other cities including Sydney, Australia.</p> <p><b>Status:</b> Complete, operational, and being developed</p>

### 2.1.2 Progress since 2014

Description of the progress in the area since 2014:

As described in 2.1.1.

### 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)

A National Access Point (NAP) has been facilitated through Ireland’s Open Data Portal. This can be found at <https://data.gov.ie/data>. The site has a Transport section and a number of contributors. Of direct relevance to ITS is data from Transport Infrastructure Ireland (TII), National Transport Authority (NTA), and Local Authorities.

Discussions have taken place with the National Standards Authority of Ireland (NSAI) with regard to them fulfilling the role of Competence Assessment Body or National Body. This fulfils the requirements in the Priority Action Regulations made under the delegated authority contained in the ITS Directive. It is hoped that the Quality Benchmarking Report prepared under an EU EIP sub-activity will assist the NSAI with their work as well as creating a harmonised framework for this work within the EU.

The motorways not included in the comprehensive trans-European road network and identified priority zones:

- **M2** – circa 13.5 km between Cherryhound and Rath roundabout north of Ashbourne
- **M3** – circa 51 km between Clonee and Kells

Additional information:

N/A.

#### **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)**

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:

##### **Transport Infrastructure Ireland (TII)**

Universal traffic information gathered by TII is made available to the National Access Point hosted, hosted at [data.gov.ie](http://data.gov.ie). Quality, at a basic level, is automatically monitored by the system which generates the information. No formal structured user-level monitoring exists other than journalistic feedback from TII staff and consultants.

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

N/A.

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

N/A.

Additional information:

N/A.

## 2.2 Priority area II. *Continuity of traffic and freight management ITS services*

In the period from 2014 to 2017 there has been a move by national and local authorities to expand the coverage of systems (e.g. RTPI), integrate systems (e.g. CCTV) and make best use of expertise which has seen the application of systems cross administrative boundaries (e.g. ANPR). Furthermore, the definitive island geography of Ireland has allowed the development of systems (e.g. tolling) that can be difficult to develop and implement in more open road networks.

The primary method of transport of freight in Ireland is by road and as such there has been no separation in the ITS services between freight and other road users.

### 2.2.1 Description of the national activities and projects

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

Project/Activities	Description
Interoperable System for Electronic Tolling	<p><b>Partners:</b> TII</p> <p>To provide an information exchange system so that electronic tags can be used at all the toll plazas on the Irish roads network.</p> <p><b>Status:</b> Complete, Operational</p>
Interoperability Management Services Provider	<p><b>Partners:</b> TII</p> <p>Upgrade of National Electronic Toll Collection (ETC) Interoperability Transaction Clearing hub to provide next-generation National interoperability services and to facilitate European Electronic Toll Service (EETS).</p> <p><b>Status:</b> Complete, Operational</p>
Toll System Renewals and Upgrades	<p><b>Partners:</b> TII, DCC</p> <p>Renewal and upgrade of tolling systems to avail of technology advances/replace components that have reached end of life and to comply with requirements of EETS Directive.</p> <p><b>Status:</b> Complete, Operational</p>
CCTV Cameras	<p><b>Partners:</b> TII, Local Authorities</p> <p>A number of projects have provided the expansion of CCTV coverage of the transport networks including the installation of CCTV camera at key locations and linkage to Traffic Management Control Centres. The CCTV is used to monitor the traffic network, manage incidents and in certain authorities to monitor bus stop and bus lane usage for enforcement purposes.</p> <p>The rollout of higher specification HD cameras is being undertaken by authorities, together with the upgrades to communication networks to facilitate higher bandwidth requirements. The information is relayed back to various Traffic Management Centres where it is disseminated to media services, social media and the emergency services as required.</p> <p>Integration projects are being undertaken by neighbouring authorities to share CCTV services for the management of transport networks.</p>

Project/Activities	Description
	<p>Some authorities have also deployed Red Light Monitoring and Speed Monitoring CCTV systems for evaluation as pilot projects.</p> <p><b>Status:</b> Complete, Operational, and being developed</p>

### 2.2.2 Progress since 2014

Description of the progress in the area since 2014:

As described in 2.2.1.

## 2.3 Priority area III. ITS road safety and security applications

### 2.3.1 Description of the national activities and projects

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

Project/Activities	Description
Adaptive Urban Traffic Control	<p><b>Partners:</b> DTTAS, TII, NTA, Local Authorities</p> <p>There are three adaptive Urban Traffic Control (UTC) systems in the metropolitan areas in Ireland: SCATS, SCOOT and SPOT UTOPIA. These UTC systems link Traffic Signals Controllers with a central server to coordinate their operation to improve efficiency, reduce stops and delays, reduce congestion, provide public transport priority, and improve safety at junctions.</p> <p>Away from metropolitan areas UTC systems are generally not used to coordinate the operation of traffic signal controllers, as there is no benefit to be achieved in linking the operation of isolated junctions.</p> <p>In the Greater Dublin Area, the SCATS (Sydney Coordinated Adaptive Traffic System) has been the UTC system employed by DCC to optimise traffic flow at junctions. Through agreement with the NTA and the four local authorities in the Greater Dublin Area, the SCATS system has been installed into the other local authorities administrative areas to provide, where needed, regional level coordination. The SCATS System also provides priority, over other traffic for light rail and bus services approaching road junctions. DCC have now started deploying latest generation SCATS traffic signal controllers with IP communications and ITS capabilities on all new junctions.</p> <p>The NTA funded DCC to set up a project team for Bus Priority using the Dublin Bus centralised Automatic Vehicle Location System (AVLS) and the Dublin Urban Traffic Control System (SCATS).</p> <p>SPOT UTOPIA is employed in Galway City, and SCOOT is used in other metropolitan areas including Cork, Limerick and Kildare offering similar and comparable functionality.</p> <p>To facilitate the expansion of the UTC systems, all authorities have expanded their communications networks of fibre optic cable and wireless broadband, replacing twisted copper pairs and leased lines. These communication mediums provide high speed, low latency connections that are utilised by other ITS devices and offer connections for other functions of the authorities.</p> <p>All authorities are engaged in programs to replace obsolete traffic signal controllers with latest IP controllers, upgrade to Extra Low Voltage controllers and equipment, and utilise LED signal aspects to improve on the resilience and safety of the systems.</p> <p><b>Status:</b> Complete, operational and being developed</p>
Remote Monitoring System (RMS)	<p><b>Partners:</b> DTTAS, Local Authorities</p> <p>Remote Monitoring Systems (RMS) have been implemented in multiple urban and rural areas to monitor the status of traffic signal controllers.</p>



Project/Activities	Description
	<p>The RMS notifies the authority and traffic signal maintenance contractor of faults with signals, escalating the target time to repair of urgent (safety related) faults.</p> <p>All junctions forming part of the UTC systems are automatically connected to the RMS functionality of the UTC.</p> <p>Many junctions not forming part of a UTC system are connected to a dedicated RMS, with communications provided over low bandwidth twisted pair copper or mobile communications.</p> <p><b>Status:</b> Complete, operational and being developed</p>
<p>Dilemma Zone Monitoring at isolated junctions</p>	<p><b>Partners:</b> DTTAS, TII, NTA, Local Authorities</p> <p>Local authorities continue to implement and expand the use of traffic signal controllers with MOVA or LHOVRA functionality for high speed or isolated junctions.</p> <p>MOVA and LHOVRA functionalities utilise additional detection for Dilemma Zone Monitoring that actively monitors driver behaviour during the Amber period of a signal phase, and will alter the Amber/All Red timings based on that behaviour to provide the safest outcome.</p> <p><b>Status:</b> Complete, operational and being developed</p>
<p>Parking Guidance and Variable Message Signs</p>	<p><b>Partners:</b> DTTAS, TII, NTA, Local Authorities</p> <p>Variable Message Signs are provided on the road network to allow for relevant, accurate and timely communication of information on the status of the network and to highlight Road Safety issues. TII were active in the period of 2011 to 2014 in the deployment of VMS in the Greater Dublin Area and on the Major Inter-Urban (MIU) routes but their plans to expand on these deployments were hampered in the 2014-2017 period due to scarce capital investment. Plans are in development to recommence the MIU deployments.</p> <p>TII have undertaken some limited deployments on the road network in conjunction with various local authorities, as well as Lane Control Signal (LCS) pilot deployment in advance of a full deployment on the M50. The LCS provide the functionality to set speed limits, lane closures and merges etc. The performance of these signs is currently being evaluated.</p> <p>Many local authorities have undertaken the deployment of Parking Guidance Signs, as part of Parking Guidance strategies, in metropolitan areas to provide real-time information of the availability of parking spaces and routing information to reduce circulating traffic.</p> <p>TII have also engaged with the policing authority to utilise their VMS in Amber Alter scenarios.</p> <p><b>Status:</b> Complete, operational and being developed</p>
<p>Dynamic Warning and Speed Activated Speed Signs</p>	<p><b>Partners:</b> DTTAS, TII, NTA, Local Authorities</p> <p>To better control traffic in sensitive areas and areas with an accident history, a number of schemes have been rolled out to provide Dynamic Warning (including School Warning Signs) and Speed Activated signs. These signs monitor vehicular speed and display a message to the driver of the vehicle indicating their speed or compliance with speed limits.</p>

Project/Activities	Description
	<p>Many of the Speed Activated signs now facilitate the recording of vehicle numbers and speeds. This data is communicated wirelessly to the appropriate authority.</p> <p><b>Status:</b> Complete, operational and being developed</p>
Active Intelligent Road Studs	<p><b>Partners:</b> TII</p> <p>To increase the visibility of the status of traffic signals, in particular in congested urban areas, and to aid driver and pedestrian safety, flashing road studs were installed at a number of junctions. These studs have also been installed in the Dublin Tunnel to highlight maintenance vehicle service bays. TII have sourced a new higher intensity road stud to test at a number of locations.</p> <p><b>Status:</b> Ongoing, evaluation</p>
Mobile applications for the vision impaired	<p><b>Partners:</b> TII</p> <p>This project was initiated to make the Luas light rail RTPi application available to vision-impaired users. Luas had previously provided apps for Apple iOS and Android smartphones providing RPTi and Luas Customer Information. The <i>Luas App for the Vision Impaired</i> differs from the general applications in that it is designed to use the accessibility functionality of the smartphone; in particular the Voiceover functionality. The Luas iOS VI Application has been downloaded by 2.9k users. Given the amount of Luas users likely to have a vision impairment (circa 1% or 900 people), this amount of users for the VI application represents a significant user base.</p> <p><b>Status:</b> Complete, operational and being developed</p>
Upgrade internal CCTV on Luas light rail	<p><b>Partners:</b> TII</p> <p>To improve security and incident management of the light rail fleet the internal CCTV was upgraded. This project is being developed to enable real-time remote viewing of CCTV images from the internal cameras.</p> <p><b>Status:</b> Complete, Operational, and being developed</p>
Upgrade of Luas stop CCTV	<p><b>Partners:</b> TII</p> <p>Following the successful upgrading of an analogue camera to internet protocol (IP) on a pilot project, all new cameras provided as part of the LCC extension project are IP-based, using the same software platform. Another project to replace the 200 analogue cameras on the existing Luas network with IP cameras is being examined.</p> <p><b>Status:</b> Complete, operational, and being developed</p>
Red light camera project	<p><b>Partners:</b> TII, Garda Síochána (National Police force)</p> <p>The aim of the Red Light Camera Project is to reduce the number of road traffic collisions which were caused by motorists breaking red lights at signalised junctions. The objectives of the Red Light Camera Project were to bring these cameras into operation and issue Fixed Charge Penalty Notices (FCNs). The red light camera was successfully commissioned and</p>

Project/Activities	Description
	<p>began issuing Fixed Charge Penalty Notices via the Garda computer system for accepted detections.</p> <p>This pilot project is being changed to a permanent installation with additional cameras deployed on the network.</p> <p><b>Status:</b> Complete, operational, and being developed</p>
Red traffic signal monitoring equipment	<p><b>Partners:</b> TII</p> <p>TII engaged a specialist Video Content Analytics company to develop a portable stand-alone CCTV camera system able to record red light infringements and monitor motorists' behaviour at Luas junctions. After the successful conclusion of the trial, the system was acquired in 2016. The camera incorporates intelligent video analytics primed to recognise vehicles violating a red light signal aspect. Any violations are recorded for later analysis. The installation is portable and battery driven and does not require to be connected to a road traffic controller, road loops or power supply. This CCTV camera is being used to gather data which will identify high risk junctions and support the assessment of junctions for possible future mitigation measures, including future red light camera installations.</p> <p><b>Status:</b> Complete, operational, and being developed</p>
Signals Passed at Danger Detection (SPAD) Project	<p><b>Partners:</b> TII</p> <p>Work was carried out on specifying and testing an intelligent video system to automatically detect when a tram is approaching or passing a signal displaying a stop aspect. Originally envisaged as a SPAD detection system, the system evolved not only to detect when a tram has passed a stop signal but also to warn a tram approaching a signal showing "Stop", as a potential driver's aid. Software development continued and successful off-line trials have been carried out.</p> <p><b>Status:</b> Ongoing</p>
Average Speed and Dangerous Goods Vehicle Monitoring Project	<p><b>Partners:</b> TII, Garda Síochána</p> <p>TII maintain and operate the Dublin Tunnel, which provides a direct road link between Dublin Port and the motorway network. Two discrete system were installed to facilitate average speed monitoring and to monitor the presence of and contents of dangerous goods vehicles within the tunnel.</p> <p>The average speed monitoring is an isolated system that issues Fixed Charge Penalty Notices via the Garda computer system for accepted offences.</p> <p>The Dangerous Good Vehicle system, integrated with the Tunnel operating systems, uses CCTV to recognise vehicle hazard warning plates and identifies the level of escalation required in the event of an incident.</p> <p><b>Status:</b> Complete and Operational</p>

### 2.3.2 Progress since 2014

Description of the progress in the area since 2014:

As described in 2.3.1.

### 2.3.3 112 eCall (priority action d)

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:

Ireland has taken part in an EU Commission supported programme I\_HeERO funded through ERTICO. The purpose of this programme is to upgrade all Public Service Answering Points (PSAP) or Emergency Call Answering Service in Ireland to deal with eCall. The upgrade of the PSAPs in Ireland has been undertaken by the Department of Communications, Climate Action and Environment who have overall responsibility for the Emergency Call Answering Service in Ireland. Ireland will be fully ready to implement eCall with effect from 31<sup>st</sup> March 2018 as required by the ITS Regulations.

Additional information:

N/A

### 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:

N/A. Ireland does not have the conditions requiring safe and secure parking places for trucks and commercial vehicles.

Percentage of parking places registered in the information service:

N/A.

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

N/A.

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?)

N/A.

## 2.4 Priority area IV. Linking the vehicle with the transport infrastructure

### 2.4.1 Description of the national activities and projects

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

Project/Activities	Description
Centralised Bus Priority System	<p><b>Partners:</b> NTA, Dublin City Council</p> <p>As presented in section 2.1 this project developed an interface between the AVLS from Dublin Bus and the SCATS Traffic Control System such that Bus priority at junctions and along key routes can be granted. The link between the AVLS and the SCATS Traffic Signal Control is further supplemented by shortwave communications between a radio beacon unit on the vehicle and the traffic signal controller to fine-tune the priority being provided by the SCATS central server.</p> <p><b>Status:</b> Complete, operational and being developed.</p>
Auto-routing of Light Rail	<p><b>Partners:</b> TII</p> <p>Auto-routing of Luas light rail at two depots was commissioned during 2015 and 2016. This system sets the tram destination automatically, leaving the driver free to concentrate on other duties. The auto-routing at the two depots is conditional, meaning that the route for the tram is only set when the driver is ready to move and has pressed the Ready to Start (RTS) button in the cab. The LCC Luas extension will also include auto-routing at a number of key locations along the route.</p> <p><b>Status:</b> Complete, operational and being developed</p>

### 2.4.2 Progress since 2014

Description of the progress in the area since 2014:

As described in 2.4.1.

## 2.5 Other initiatives / highlights

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

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

Project/Activities	Description
Communications Infrastructure for ITS	<p><b>Partners:</b> TII, Local Authorities</p> <p>All authorities are actively including infrastructure for ITS in new road build/upgrade schemes, in particular cable conduits and chambers appropriate for the installation of fibre optic cable. As new road build/upgrade schemes progress, the authorities are filling in the gaps in the ITS infrastructure to provide continuity of their networks.</p> <p>Where it is not feasible to fill in gaps, or as a temporary measure, high bandwidth wireless point-to-point communications are used to bridge. As cable conduits become available, authorities are installing fibre optic cable and network equipment to connect ITS apparatus to Traffic Management Centres and replace mobile/wireless communications, leased lines and twisted pair copper cable.</p> <p>The fibre optic cables are also used to establish high speed connectivity for authorities' other functions. In the greater Dublin Area fibre optic cable has been used to connect authorities Traffic Management Centres.</p> <p><b>Status:</b> Complete, operational and being developed</p>
Electric Vehicle Infrastructure	<p><b>Partners:</b> Various</p> <p>In developing a national network of public charging points ESB have overseen the completion of national electric vehicle (EV) charge point network of ~800 AC 22kV charge points and 80 fast 50kW DC charge points and integration to charge point management IT system enabling real-time monitoring and management.</p> <p>Tesla have also commenced a programme for the installation of supercharging points in Ireland.</p> <p><b>Status:</b> Complete, operational and being developed</p>
M50 Motorway - Demand Management Programme	<p><b>Partners:</b> TII</p> <p>TII have embarked on a project to deploy an integrated package of measures to facilitate better management of demand on the M50 corridor, around Dublin, and to protect the traffic capacity provided by the recent Motorway Upgrade Scheme. This project is currently being designed and is examining policy and legislation to allow for:</p> <ul style="list-style-type: none"> <li>• The deployment of additional ITS equipment to facilitate variable speed/flow control;</li> <li>• The deployment of additional ITS equipment to facilitate more responsive incident management procedures;</li> <li>• The introduction of supporting travel planning initiatives to enable motorists to plan their journeys for less congested periods.</li> </ul> <p><b>Status:</b> In development</p>

Project/Activities	Description
Major Inter-Urban ITS projects	<p><b>Partners:</b> TII</p> <p>TII are currently planning a large scale ITS deployment on the MIUs to expand and update earlier deployments. These projects are planned:</p> <ul style="list-style-type: none"> <li>• To deploy roadside traffic monitoring devices along each MIU route;</li> <li>• Include the development of a programme to expand the current Motorway Traffic Control Centre.</li> <li>• And to deploy roadside VMS approaching every interchange along the MIU routes to provide relevant, accurate and timely information to road users;</li> </ul> <p><b>Status:</b> In development</p>
National ITS Strategy and Architecture	<p><b>Partners:</b> DTTAS, TII, NTA</p> <p>To facilitate the co-ordination of ITS deployment in Ireland, DTTAS have commenced the development of a National ITS Strategy. This document is under review prior to publication, with a particular focus of provisions for CAVs and C-ITS.</p> <p>TII have commenced the development of a high level 10-year policy for ITS Deployment on the TEN-T network in Ireland, incorporating relevant national and EU policies as well as international best practice. The development of an “across-the-board” set of ITS standards for Ireland is drawing upon European and international best practice.</p> <p>The NTA are developing an ITS Strategy to provide framework for future investment in ITS in the Greater Dublin Area. The Strategy will address (i) legacy, (ii) procurement, (iii) resourcing and maintenance, (iv) data management, (v) investment priorities, (vi) compliance with ITS Directive.</p> <p><b>Status:</b> Ongoing</p>
<b>Upgrade and Coordination of Traffic Management Centres</b>	<p><b>Partners:</b> DTTAS, TII, NTA, Local Authorities</p> <p>All Traffic Management Centres in Ireland undergo continuous upgrade, be it to facilities, systems or interconnectivity. These updates/upgrades are undertaken to provide better traffic management and provision for dealing with emergency operations, ensure speedier and better response to any incidents or emergencies that arise and enhancing service provisions to other authorities across the regions and country.</p> <p>In Dublin a review of the 11 surface transport control centres was undertaken on behalf of the NTA. The focus of the NTA since this review was undertaken has been to generate an integrated plan for the city centre (in terms of transport networks, interchange points and traffic management routes). Once the required integration is set out, the NTA will progress the Strategic Traffic Management Plan (STMP) for the Greater Dublin Area, and with it, the proposed ITS structures and systems to support the STMP.</p>

Project/Activities	Description
	<p>The SCATS Traffic control system has been expanded and enhanced and DCC provides ITS services for a number of other local authorities across the region and country, including DLRCC, FCC, and SDCC.</p> <p>An upgrade for the TII Motorway Traffic Control Centre is currently planned to expand both its size and functionality.</p> <p><b>Status:</b> Ongoing</p>
<b>Mobile Speed Enforcement</b>	<p><b>Partners:</b> RSA, Garda Síochána</p> <p>The An Garda Síochána Mobile Camera Project is an initiative set up with the Road Safety Authority to use Mobile Speed Enforcement Vans at defined locations, where locations have a history of speed related deaths and injuries. This project on the road network has the objective to change driver behaviour and save lives.</p> <p>The speed enforcement locations are published on the Garda Síochána website.</p> <p>The overall road safety initiative, of which this project forms part, has seen deaths from road accidents drop from 193 in 2014 to 159 in 2017, see also Appendix 1.</p> <p><b>Status:</b> Ongoing</p>
Shared Bicycle Schemes	<p><b>Partners:</b> NTA, Local authorities</p> <p>The Bicycle Share Schemes have been deployed to encourage the shift from vehicular traffic to a more sustainable mode and to improve cycle safety.</p> <p>The original Dublin Bike Scheme was funded by Dublin City Council. The Dublin Bikes scheme has been very successful and is expanding the number of stations and bikes.</p> <p>The NTA has established, regional bike schemes in Limerick, Cork and Galway, these are administered by the local authorities. 95% of rentals incur no charge.</p> <p>These bikes schemes are integrated with the multimodal Journey Planner system employed by the NTA.</p> <p><b>Status:</b> Complete, operational and being developed</p>

### 2.5.2 Progress since 2014

Description of the progress in the area since 2014:

As described in 2.5.1.



### 3 Key Performance Indicators (KPIs)

The EC document on "ITS KPIs for the EU" was used for the definitions of the KPIs and further guidance.

The KPIs are reported separately by type of road network/priority zone/transport network and nodes (when appropriate).

For the calculation of the KPIs, the following total lengths of road networks in Ireland is to be used:

National Roads (responsibility of TII)	
<b>Main North Sea-Mediterranean Corridor (M1/M50/M7/M8)</b> (This forms part of the Core TEN-T Network)	373 km
<b>Core TEN-T Network</b>	469 km
<b>Comprehensive TEN-T Network</b>	543 km
<b>Motorways (Not Part of TEN-T)</b>	73 km
<b>Other Sections</b>	4221 km
<b>Total</b>	5,306 km
Other Roads (responsibility of Local Authorities)	
<b>Total</b>	94,807 km



Figure 3-1: Main North Sea – Mediterranean Corridor (rail + road)



Figure 3-2: Ireland Core Network



Figure 3-3: Ireland Comprehensive Network

### 3.1 Deployment KPIs

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

Relating to this category, TII gathers two types of information: Weather and Environmental Conditions, and Traffic Conditions.

All the figures below refer to fixed equipment; mobile equipment is not used.

#### 3.1.2 Incident detection (road KPI)

Figures to be provided	Road Network	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 information gathering infrastructures 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
Network/Part of Network	Incident Detection	
National Roads		
Main Corridor	111 / 373	30
Core TEN-T	111 / 469	24
Comprehensive TEN-T	20 / 543	4
Motorways	0 / 73	0
Other Sections	0 / 4221	0
Key Respondents outside of National Roads		
South Dublin County Council	50 / 950	5
Dún Laoghaire-Rathdown County Council	47.5 / 135	35
Limerick City & County Council	33.1 / 93.8	35

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

Figures to be provided	Road Network	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 (in km) 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
Network/Part of Network	Traffic management and traffic control measures	
	National Roads	
Main Corridor	5 / 373	1
Core TEN-T	5 / 469	1
Comprehensive TEN-T	0 / 543	0
Motorways	0 / 73	0
Other Sections	0 / 4221	0
	Key Respondents outside of National Roads	
South Dublin County Council	450 / 950	47
Dún Laoghaire-Rathdown County Council	72 / 135	53
Limerick City & County Council	34.2 / 93.8	36
Figures to be provided	Road Network	KPI
Figures to be provided by type of network/zone. KPI to be calculated by type of network/zone (when relevant). <i>Figures to distinguish fixed and mobile equipment. - not distinguished in Ireland</i>	Length of road network type/road sections (in km) equipped with information gathering infrastructures 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
Network/Part of Network	Weather and Environmental Conditions	
Main Corridor	373 / 373	100
Core TEN-T	469 / 469	100
Comprehensive TEN-T	543 / 543	100
Motorways	73 / 73	100
Other Sections	4221 / 4221	100
	Traffic Conditions	
Main Corridor	111 / 373	30
Core TEN-T	111 / 469	24
Comprehensive TEN-T	20 / 543	4
Motorways	0 / 73	0
Other Sections	0 / 4221	0
	Information Gathering Structures	
South Dublin County Council	120 / 950	13
Dún Laoghaire-Rathdown County Council	72 / 135	53
Limerick City & County Council	33.4 / 93.8	36

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

Figures to be provided	Road Network	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 (in km) 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
Network/Part of Network	Real-time Traffic Information	
	National Roads	
Main Corridor	155 / 373	42
Core TEN-T	155 / 469	33
Comprehensive TEN-T	73 / 543	13
Motorways	32 / 73	44
Other Sections	0 / 4221	0
	Key Respondents outside National Roads	
South Dublin County Council	120 / 950	12
Dún Laoghaire-Rathdown County Council	14.1 / 135	10
Limerick City & County Council	10.7 / 93.8	11



### 3.1.5 Dynamic travel information (multimodal KPI)

Figures to be provided	Network	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 <b>transport network type</b> (in km) with provision of dynamic travel information services (in km) Total length of this same road network type (in km)	KPI = (kilometres of transport network type with provision of dynamic travel information services / total kilometres of same transport network type) x 100
Network/Part of Network	Real-time Traffic Information (per network km)	
<b>ROAD</b>		
Dún Laoghaire-Rathdown County Council	3 / 135	2
Limerick City & County Council – National Roads	0 / 17.3	0
Limerick City & County Council – Regional Roads	3.7 / 93.8	4
<b>RAIL</b>		
Luas Light Rail Network (excl. Luas Cross City)	36.5 / 36.5	100
Iarnród Éireann Rail Network	2400 / 2400	100
	Number of <b>transport nodes</b> (e.g. rail or bus stations) covered by dynamic travel information services Total number of the same transport nodes	KPI = (number of transport nodes with provision of dynamic travel information services / total number of same transport nodes) x 100
Network/Part of Network	Real-time Traffic Information (per transport node)	
<b>ROAD</b>		
Bus stops Greater Dublin Area, regional and rural cities (Cork, Limerick, Galway)	704 / ca. 12000	6
<b>RAIL</b>		
Luas (excl. Luas Cross City)	54 / 54	100
Railway Stations	236 / 236	100

As provided by the NTA, in Ireland dynamic travel information means up to date information derived from any travel data provided by any transport operators or service providers through usual communication channels. It relates to pre-trip and on-trip information to any travellers. Such information includes for instance disruptions, travel times/delays, vehicles positioning, accessibility of nodes and vehicles. Any information that is made available to users is provided in such a form so that it can be received in full also by users who might have specific requirements related to the data. For example people with reduced mobility, orientation and/or communication.

In addition to the figures provided above relating to the real-time traffic information as on-street/on-platform display signs showing the arrival times of public transport vehicles, the NTA provides the National Intermodal Journey Planner. The service provides door-to-door transport planning through the internet and mobile services. It has all island coverage and features information on different modes of transport, such as trains, trams, buses, taxis, ferries to the islands, regional airlines and walking. The planner integrates with the existing real-time passenger information service for real-time journey planning where appropriate.

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

*Freight information means static and dynamic information tailored to the needs of the freight industry.* In Ireland, there is no dedicated freight information services available. However, some of the KPIs above, such as the dynamic travel information, incident detection on national roads, traffic management and control measures can apply to freight transport as well.

### **3.1.7 112 eCalls (road KPI)**

The information will be provided by the COCOM 112 Report.



## **3.2 Benefits KPIs**

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

The change in travel time before and after the implementation of ITS is not captured.

Changes in travel time are difficult to determine reliably. ITS is mainly implemented in places with rising traffic volumes which lead to increased journey times, so that the impact of ITS is not exactly measurable or comparable over time.

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

The Road Safety Authority captures statistics in relation to all road traffic collisions. This information is available via [data.gov.ie](http://data.gov.ie). A sample info-graphic, published by the Road Safety Authority, is included in Appendix 1. However, the impact of ITS systems on the change in number of death or injuries from road traffic collisions is not captured and it is not possible to disaggregate using the information currently captured.

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

Not collected.

### 3.3 Financial KPIs

The calculation of financial ITS KPIs includes any types of systems and services altogether.

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

Annual investment in road ITS (as % of total infrastructure investment)	2014	2015	2016
<b>Transport Infrastructure Ireland – National Roads</b>	1,931,860 €	1,721,251 €	1,320,374 €

TII, responsible for the National Road Network, only provides figures for absolute annual investment in road ITS, not as a percentage of total infrastructure investment.

TII's Annual Investment in ITS is based on annual programmes so it fluctuates year-on-year. TII expenditure in respect of road user data facilities in the period 2014-2016 relates primarily to operational and maintenance costs. No significant capital investment was expended. However, significant investment is anticipated in 2018/2019.

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

Annual Operating and Maintenance costs of road ITS (€/km of network covered)	2014	2015	2016
<b>Transport Infrastructure Ireland – National Roads</b>			
Total O&M costs	1,456,462 €	1,767,459 €	1,090,828 €
O&M Costs for Main/Core/Comprehensive TEN-T Network (1385 km)	1052 €/km	1276 €/km	788 €/km
O&M Costs incl National and Secondary road network (5679 km)	256 €/km	311 €/km	192 €/km

The predominance of ITS appears on the North Sea-Mediterranean Corridor (373 km), Core TEN-T Network (469 km) and Comprehensive TEN-T Network (543 km) which accounts for 1385 km. However, the network coverage, in theory, is all national roads (5306 km) as ITS includes traffic counter and school warning signs which appear on the national secondary road network.

On the non-National road network there is significant activity with regard to ITS being undertaken by the Local Authorities. This is particularly concentrated in the urban and city environments. ITS is not a budget heading for Local Authorities and the Investment, Operation and Maintenance costs are not disaggregated from the broader headings in Road Budgets.

## Glossary

Bluetooth Readers	Bluetooth is a wireless technology standard for exchanging data over short distances (using short-wavelength UHF radio waves in the ISM band from 2.4 to 2.485 GHz) from fixed and mobile devices, and building personal area networks. In a traffic environment Bluetooth readers are used to identify particular devices, and that information can be used to track a device across the network.
Datasets	A data set (or dataset) is a collection of data. Most commonly a data set corresponds to the contents of a single database table, or a single statistical data matrix, where every column of the table represents a particular variable, and each row corresponds to a given member of the data set in question.
DATEX II	The European traffic data exchange protocol
Dynamic Travel Information	Travel information that is amended in reaction to changes in the network conditions.
Dynamic Warning Signs	Warning signs fitted with detection devices that will display appropriate, preprogramed, messages based on observed network conditions.
Embedded inductive loops	A metal coil buried in the road service that detects the presence of vehicles by currents induced in the cable.
Greater Dublin Area	The geographic area comprising the four Dublin local authorities and portions of the adjacent counties including Kildare, Meath, Wicklow and Louth.
Journey Planners	A system that allows a user to input start and end points for a particular journey, the system then calculates appropriate routes for that journey. Journey Planners can be multimodal, allowing them to provide comparisons on different routes and modes.
LUAS Light Rail	The LUAS is the Dublin Light Rail system comprising of two lines (Red and Green) and an interconnecting service.
M50	The main orbital motorway around Dublin, connecting to the M1, M11 and Dublin Port.
Open Data	Open data is the idea that some data should be freely available to everyone to use and republish as they wish, without restrictions from copyright, patents or other mechanisms of control. The goals of the open data movement are similar to those of other "open" movements such as open source, open hardware, open content, open government, open access, and open science. Paradoxically, the growth of the open data movement is paralleled by a rise in intellectual property rights
Red Light Monitoring	A system that monitors vehicles that progress into a junction across a stop line that has an associated right traffic signal aspect displayed. These systems will utilise CCTV connected to the traffic signal controller.
Smart Cities	A smart city is an urban area that uses different types of electronic data collection sensors to supply information which is used to manage assets and resources efficiently.[1] This includes data collected from citizens, devices, and assets that is processed and analyzed to monitor and manage traffic and transportation systems, power plants, water supply networks, waste management, law enforcement, information systems, schools, libraries, hospitals, and other community services. The smart city concept integrates information and communication technology (ICT), and various physical devices connected to the network (the Internet of things or IoT) to optimize the efficiency of city operations and services and connect to citizens. Smart city technology allows city officials to interact directly with both community and city infrastructure and to monitor what is happening in the city and how the city is evolving.

Speed Activated signs	Dynamic Warning Signs that will display the speed of an approaching vehicle, in a manner that can be observed by the driver.
Speed Monitoring	A system that monitors the speed of vehicles at a single point or over a specific section of road. These systems can utilise multiple detection technologies including Radar, CCTV and ANPR.
Web-Application	In computing, a web application or web app is a client–server computer program in which the client (including the user interface and client-side logic) runs in a web browser. Common web applications include webmail, online retail sales, online auctions, wikis, instant messaging services and many other functions.

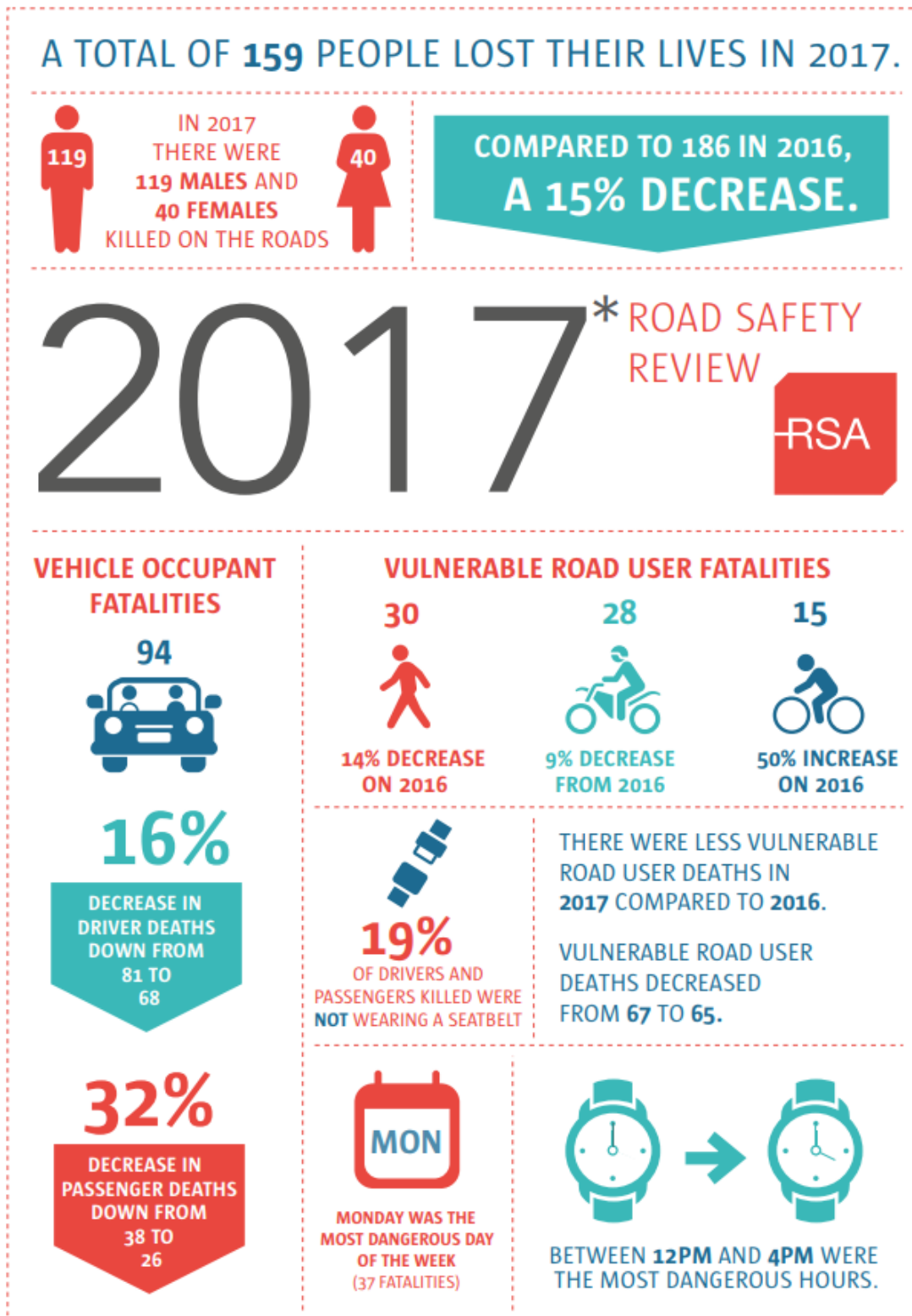
## Abbreviations

ANPR	Automatic Number Plate Recognition
AVLS	Automatic Vehicle Locating System
CAV	Connected and Autonomous Vehicles
CCC	Cork City Council
CCTV	Closed Circuit Television
C-ITS	Cooperative Intelligent Transport Systems
CSO	Central Statistics Office
DCC	Dublin City Council
DCCA	Department of Communications, Climate Action and Environment
DLRCC	Dun Laoghaire-Rathdown County Council
DTTAS	Department of Transport, Tourism and Sport
EETS	European Electronic Toll Service.
EIP	European ITS Platform
eMOS	Enhancing Motorway Operation Services
ESB	Electricity Supply Board
ETC	Electronic Toll Collection
FCC	Fingal County Council
FCN	Fixed Charge Notices
GCC	Galway City Council
GIS	Geographic Information System
IP	Internet Protocol
ITS	Intelligent Transport Systems
KCC	Kildare County Council
LA	Local Authorities
LC&CC	Limerick City & County Council
LCC	LUAS Cross City
LCS	Lane Control Sign
LED	Light Emitting Diode
LGMA	Local Government Management Agency
MIU	Major Inter Urban
MOVA	Microprocessor Optimised Vehicle Actuation
MTCC	Motorway Traffic Control Centre
NAP	National Access Point
NRA	National Roads Authority
NSAI	National Standards Authority of Ireland
NTA	National Transport Authority
OSI	Ordnance Survey Ireland
P2PE	Point- To- Point Encryption
PCI-DSS	Payment Card Industry Data Security Standard
PMS	Pavement Management System
RMO	Road Management Office
RMS	Remote Monitoring Systems
RSA	Road Safety Authority

RTPI	Real- Time Passenger Information
RTS	Ready to Start
SCATS	Sydney Coordinated Adaptive Traffic System
SCOOT	Split Cycle Offset Optimisation Technique
SDCC	South Dublin County Council
SPAD	Signals Passed at Danger Detection
STMP	Strategic Traffic Management Plan
TII	Transport Infrastructure Ireland
TVM	Ticket Vending Machine
UTC	Urban Traffic Control
VMS	Variable Message Sign

## Appendices

### Appendix 1



Road Safety Authority Info Graphic available through [data.gov.ie](http://data.gov.ie)

## Appendix 2

