



An Roinn Iompair  
Department of Transport

# Ireland's ITS Report

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December 2023



# Directive 2010/40/EU Progress Report 2023 *Ireland*

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December 2023

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# 1 Introduction

## 1.1 General overview of the national activities and projects

*Including national ITS legislations and/or strategies*

This report sets out the activities and projects in Ireland regarding the priority areas under Directive 2010/40/EU on the framework for the deployment of Intelligent Transport Systems (ITS) in the field of road transport and for interfaces with other modes of transport, covering:

- I. Optimal use of road, traffic and travel data;
- II. Continuity of traffic and freight management ITS services;
- III. ITS road safety and security applications;
- IV. Linking the vehicle with the transport infrastructure.

The report has been prepared by the Department of Transport, with input from Transport Infrastructure Ireland (TII), the National Transport Authority (NTA), the Local Government Management Agency (LGMA) and local authorities. It covers the period from 2020 to the present, in line with Article 17.3 of the ITS Directive.

The Department of Transport has responsibility for overall policy, strategy, and funding in relation to the national roads programme and national roads network in Ireland. The operation and management of the public road network in Ireland is the responsibility of a number of state organisations (TII and the 31 local authorities). TII operates, develops and manages the national primary and secondary road network which accounts for 5,300 km approximately, of which circa 900 km is motorways. This national roads network represents circa 6% of Ireland's total public road network (the remaining being regional and local roads) and carries approximately 45% of the country's total road traffic. Almost all of Ireland's freight is distributed by road.

A draft ITS strategy is currently nearing completion by TII. It will look to set out the principles of its approach, the strategic themes, and recommendations and tactical focus for successful implementation. The strategy looks to address how 'Key Enablers' are identified, covering both physical and digital elements associated with ITS; and the introduction of a 'Service Level' approach to the delivery of ITS, that links technology deployments to the outcomes achievable for both TII and the travelling public alike. A draft CAV Strategy is also in development by TII.

The Luas Cross City light rail project to connect the existing Luas lines in Dublin is now in operation. As part of this project active improvements took place in the technology employed in control, stations and rolling stock.

TII has developed protocols to allow for the provision of traffic data (including VMS settings and travel times) to the NAP.

TII has embarked on a project to deploy an integrated package of measures (referred to as eMOS – "enhancing Motorway Operation Services") involving the construction of a new Motorway Operations Control Centre, significant deployment of ITS equipment on the M50 Dublin Ring Road and the implementation of a new Network Intelligence and Management System to control all ITS equipment deployed on the national road network.

The enhancing Motorway Operations Services (eMOS) programme of works is being undertaken on the M50 to introduce variable speed limits and lane control sign (Red-X). eMOS includes the deployment of ITS

equipment (Variable Message Signs, Lane Control Signs and CCTV), the development of a new ATMS (Advanced Traffic Management System) and an upgrade to the Operations Centre. As part of eMOS the C-Roads Ireland C-ITS pilot is also being undertaken.

The objectives of these works are:

- Reduce the adverse impact of future traffic growth on the level of service provided by the M50 Dublin Ring Road which forms part of the core TEN-T network.
- Ensure that the operation and management of M50 traffic is undertaken in line with international best practice to reduce the impact of congestion and the level of disruption resulting from incidents on the M50 while enhancing journey time reliability.
- Maintain the safety record for road users and those who work on the M50. This is in addition to the wider motorway and high-speed dual carriageway network as traffic volumes continue to grow.
- Enable TII and emergency responders to implement an integrated and co-ordinated response to traffic conditions.
- Improve the dissemination of information to road users to provide enhanced awareness of incidents, events and road works.
- Implement appropriate technological solutions to support the operation of Ireland's high-speed road network.
- Implement a Cooperative ITS pilot (C-Roads Platform – details referenced below)

The deployment of the ITS equipment and the development of the new ATMS both began in 2020. Over 80% of the ITS equipment is now installed on the M50. The new ATMS is being delivered in stages. Currently the system controls the new signs on the M50 motorway with expansion to the control of existing signs across the network due to be complete by the end of the year.

The national legislation required to undertake the management of the road network via the lane control signs is now in place.

The National Transport Authority (NTA) has completed a procurement process to secure a supplier for Travel Information Systems and Services (TISS) and is currently engaged in the closing stages of a procurement process to secure a supplier for a single on-bus Automated Vehicle Location (AVL) system. The NTA has also undertaken work to extend the life of the current 800+ on-street RTP1 display signs and overseen the creation of a NeTEx profile for Ireland and the development of a NeTEx export interface.

ITS stakeholders in Ireland leverage the non-profit national organisation ITS Ireland to act as a focus for the promotion of the use of technology in the transportation and mobility sector. ITS Ireland, which celebrated its 10-year anniversary in 2020, acts as a conduit for the dissemination of ITS-related data across the Governmental, local authority, private and academic sectors. Having a collective and collaborative focus, it provides a suitable platform for the development of intelligent, multi-modal transportation, mobility and technology advances, and digital smart solutions in Ireland.

The MapRoad Pavement Management and Roadworks Licensing Systems are single-source centrally hosted systems for all roads in the country. They are national systems of regional and local road schedule information as well as road opening licence management. These systems are structured in a way that other road data can be linked at a future point; collision data (Road Safety Authority data can currently be

imported to the system and referenced spatially to road segments), traffic count data, and traffic control measures.

In the Dublin region, Dublin City Council (DCC) has continued to expand the SCATS traffic control system with additional capacity, as well as providing centrally-managed traffic services via the SCATS platform to sites in Fingal, Wicklow, Wexford, Waterford and Meath. Two new services (HGV Permit Checker and Rate My Signals) under the EU Interreg project BE-Good project have been made available to the public.

Dún Laoghaire-Rathdown County Council (DLRCC) uses ITS to optimise the operation of the traffic signals in the County, CCTV to monitor traffic, and both permanent and temporary variable message signs (VMS) to inform the travelling public. The Council has continued to expand the roll out of ITS services on its road network since 2020. This expansion has included the upgrade of additional signalised junctions to the SCATS traffic management system, additional Traffic CCTVs to monitor the traffic network, and improvements to the fibre communication network within the Authority to improve its resilience. DLRCC have upgraded traffic junctions to the SCATS traffic management system and have reached a point where almost 100% of the signalised junctions in the administrative area are now connected to SCATS. DLRCC have 105 CCTV cameras, 357 signalised junctions, signalised pedestrian crossings, 57 School Warning Signs and 67 Speed Alert Signs. DLRCC have accommodated TII in the provision of VMS (in particular on the M50, M11 and N31) and the NTA in the provision of Real Time Passenger Information at bus stops throughout the county. The Council regularly uses mobile VMS for road closures and road works. The focus of the Traffic and Road Safety Section in DLRCC has been on improving the optimisation of the operation of the traffic signals in the county.

South Dublin County Council's Traffic Management Centre is responsible for the management of traffic operations within the administrative area of the Local Authority. It does this by utilising Urban Traffic Management Control (UTMC) systems and CCTV monitoring of the road network within the administrative area of the local authority. The UTMC systems used allows previously disparate data from multiple sources such as UTC / SCOOT / RMS traffic signals control, Variable Message Signs (VMS), car parks, air quality monitoring stations and meteorological data, to be amalgamated into a central common database and facilitates the maximization potential of the road network within SDCC's area.

Cork city, with a population of over 210,000 and ambitious growth targets over the next 20 years, is an emerging international centre of scale and a national driver of economic and population growth. The direction of the future development of Cork City is guided by the National Planning Framework, Regional Spatial and Economic Strategy, Cork Metropolitan Area Strategic Plan, and the Cork Metropolitan Area Transport Strategy (CMATS). These set clear objectives for the population of Cork city to grow by 50% to 335,000 by 2040. This projected population and associated economic growth will result in a significant increase in travel demand. This demand must be managed and planned carefully to safeguard and enhance Cork's attractiveness to live, work, visit, and invest.

Cork Metropolitan Area Transport Strategy (CMATS) 2040 has been developed by the National Transport Authority (NTA) in collaboration with Transport Infrastructure Ireland (TII) and Cork City Council. The delivery of a €3.5 billion investment in transport infrastructure set out in CMATS will fundamentally change how people move around Cork city. With the support of the NTA, Cork City Council has continued to invest in deploying and using ITS Systems to promote active travel (walking and cycling) and public transport usage. Enabling the key transport projects in CMATS means delivering multi-modal usage and smart

mobility, accessible for all, while also tackling climate change through reducing energy usage, reducing emissions, and adapting to climate change.

Limerick City & County Council (LC&CC) has continued to utilise ITS on the metropolitan transport network. This report identifies the ITS-related activities undertaken by LC&CC in the Limerick Metropolitan Area for the years 2020-2022 and includes reference to some schemes which are intended to be implemented in the future. This report identifies the budgeted spending of LC&CC for each of the years in question. As LC&CC currently have numerous ITS hardware and software systems in place, a significant volume of LC&CC's ITS spending relates to the maintenance and upkeep of equipment and systems already in-situ.

Galway City Council applies smart mobility systems in the Urban Traffic Management Centre (UTMC). This contributes to making improvements to the flow of traffic particularly during peak times and during specific events likely to generate large volumes of traffic. It also assists the Council in the dissemination of real-time information to the public. The Galway Transport Strategy recommends expansion of the UTMC network to ensure that all future transport interventions will be based on the implementation of smarter mobility policies and consideration of Intelligent Transport Systems (ITS) as a means of improving the overall transport experience in the city into the future. In application, such technologies can support and facilitate initiatives that will improve sustainable transportation, including public transport, integrated ticketing, smart public lighting, electric and hybrid vehicles, car clubs, public bike schemes and improved pedestrian and cycling facilities.

The Department of Transport has signed a grant agreement for €5 million in Connecting Europe Facility (CEF) funding for a Co-operative Intelligent Transport Systems (C-ITS) pilot project, which TII is responsible for implementing. The pilot project focuses on connected vehicle services. The pilot is being deployed on the M1, the M50 through to the N7, M7 motorway to Limerick, the M8, and the N18 and M18 around Shannon. The pilot is trialling a number of vehicle to vehicle (V2V) and vehicle to infrastructure (V2I) services on select sections of the route, using a communications network that includes short range Wi-Fi (known as ITS-G5) and standard cellular communications. The pilot deployment, due to run to the end of 2024, will test and evaluate C-ITS services on the Irish Roads Network, predominantly on the Irish TEN-T network and also along urban corridors within Dublin City.

The Attorney General's Office determined that legislative amendment was required to allow for the testing of autonomous vehicles on the Irish public road network. This has been advanced through an amendment, in the recently-enacted Road Traffic and Roads Act 2023, to the definition of driving as well as the addition of a definition for 'autonomous vehicle'. The intention of these amendments is to make the driver of an AV in Ireland responsible for the safe operation of the vehicle at all times, irrespective of whether the vehicle is operating in 'manual' or 'autonomous' mode. Further legislative measures are envisaged to establish a framework for testing automated vehicles on public roads in Ireland.

Future Mobility Campus Ireland (FMCI)<sup>1</sup> has been established with the purpose of creating and delivering mobility testbed facilities for stimulating research, development and innovation in the area of Autonomous Connected Electric Shared Vehicles, including Connected and Autonomous Vehicles (CAV) in Ireland. The testbed is located in the Limerick-Shannon metropolitan area at Shannon Free Zone, Shannon, County Clare. FMCI offers a test facility located in real-world settings, providing technology companies and researchers with the ability to test and enhance their innovations. The testbed is equipped with multiple

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<sup>1</sup> <https://futuremobilityireland.ie/>

sensors, located throughout the site, along with high accuracy location systems, a data management and control centre and two sensor equipped test vehicles. This setup provides the facilities and expertise to harness valuable sensor data, simulate environments and trial new technologies. In 2020, FMCI received €4.7m in Regional Enterprise Development Funding from Enterprise Ireland - the Government organisation responsible for the development and growth of Irish enterprises in world markets.

## 1.2 General progress since 2020

### Arc Atlantique

Transport Infrastructure Ireland (TII) has participated in Arc Atlantique since 2014. The main objective of the project was 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:

- 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 III (2017 – 2022) – the project is closed out. Arc Atlantique III encompassed the deployment of 3 projects with a total investment of €7.5 Million (EU contribution of €1.5 Million):
  - **M50 MVSL (Mandatory Variable Speed Limits) Deployment** - The deployment of 4 overhead lane control/speed signs at 40 gantry locations (finished);
  - Construction of a dedicated building to house the new **Motorway Operations Centre – Motorway Traffic Control Centre** (finished in 2019, €3.5 Million approximately);
  - The development or upgrade of the ATMS to control the MVSL and all other system (finished)

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. Currently the project is closed out and the total budget was spent.

## **EU EIP – EU ITS Platform**

The **EU ITS Platform (EU EIP)** is the place where National Ministries, Road Authorities, Road Operators and partners from the private and public sectors of almost all EU Member States and neighbouring countries, cooperate in order to optimise ITS deployments in Europe in a harmonised way. The 5 ITS Corridors involved in the EU ITS Platform are: Arc Atlantique, Crocodile, Next-ITS, Med-TIS, and Ursa Major.

With a budget of €150,500, Ireland participates in several activities within the ITS Platform, e.g.: “Activity 3 - Feasibility study East-West Corridor (EWC) and first pilot implementation” and “Activity 4.6 – National Access Points”. Associated to this participation in the EU ITS Platform, an “Intermodal Route planner for freight” was developed in 2019 by Ireland as an important deliverable for all the “East-West Corridor” partners.

Under “Activity 2 - Monitoring and Dissemination” and with the objectives of exploiting the results of the EWC, disseminating ITS projects and mapping the Traffic Management Centres and Cross-Border Management plans, different inventories were made and are available through an online GIS tool. Currently the project is closed out.

## **C-Roads Platform**

Ireland upgraded its membership status within C-Roads Platform in 2019, moving from associate to core membership, and is taking an active role in the implementation of the EU C-ITS strategy, where different technical and organisational issues will be piloted in a trial of Day 1 and Day 1.5 C-ITS use cases among car and freight users (2019-2022). This project of €10 Million is funded by the European Union at a 50% funding rate.

Core Members of the C-Roads platform are European States that agree to work together to achieve deployments that enable interoperable and seamless cross-border C-ITS services for European travellers. At the current stage, eighteen European States committed to participate with their pilot sites.

The overall aim of the C-Roads Ireland C-ITS pilot is to deploy, trial and evaluate Day-1 and future C-ITS services, using both V2V and V2I communications. The pilot will include development of services to align with Irish priorities, whilst recognising relevant standards and regulation. The pilot will test and evaluate C-ITS services on the Irish Roads Network (5 sections), predominantly on the Irish TEN-T network and a strategic route approaching and within Dublin City. The pilot will consider how the wider Cooperative, Connected and Automated Mobility (CCAM) model supports C-ITS and wider CCAM considerations. An extension has been granted till December of 2024.

## **MERIDIAN**

Ireland is part of the MERIDIAN project with two ITS and C-ITS projects that amount to an investment of €6.6 million.

The MERIDIAN project will foster digitalisation of the mobility system focussing mainly on the CEF Core Network Corridors Scandinavian-Mediterranean and North Sea-Baltic. This will be achieved by implementing digital systems and services along the busiest European freight corridors. The project will further target expansion of digital infrastructure, roll-out of C-ITS in central Europe, implementation of ITS for bottlenecks on open road and tunnels, digital corridor management and Multimodal Services. Its

implementations will support common objectives to increase traffic safety, reduce congestion and environmental pollution whilst supporting the objectives of COP26 along these important freight corridors in Europe. The purpose of the project is to provide the covered TEN-T with technology and systems in accordance with the European Union transport policy on Intelligent Transport Systems (ITS). The project is congruent with the EU's ITS Action Plan and the ITS Directive and supports the development and implementation of interoperable, cross-border and continuous services that improve road safety, streamline the use of the TEN-T road network, improve multimodal use of the corridor, and reduce environmental impact and GHG emissions. For this purpose, 24 ministries, road authorities, road operators, urban and port authorities, a federal highway research institute and hub operators from Belgium, Germany, Ireland, Italy, Latvia and the Netherlands teamed up to implement 36 deployments projects on the TEN-T core and comprehensive network for more than 250 million European citizens. Through MERIDIAN, much more relevant information will be provided to national access points. MERIDIAN will contribute significantly to know-how development and actively engage in the work aiming at European harmonisation and knowledge building.

Ireland will deploy two projects under MERIDIAN between 2022 and 2025:

- 1) Deployment of ITS Equipment at approaches to the Jack Lynch Tunnel (N40/M8/N25/N8) and
- 2) Deployment of ITS equipment on the M7/N7 - approach to M50 - to facilitate incident detection.

### **New Public Transport Travel Information Systems and Services (TISS)**

The National Transport Authority (NTA) has completed a procurement process to secure a supplier for Travel Information Systems and Services (TISS), which includes the provision of a new national multi-modal journey planning system (mobile app and website) covering all modes of public transport and including Real Time Passenger Information (RTPI). One of the requirements in this contract is the capability to export NeTEx data.

### **New Automated Vehicle Location System**

In 2020 the NTA commenced and is currently engaged in the closing stages of a procurement process to secure a supplier for a single on-bus Automated Vehicle Location (AVL) system in order to consolidate and centralise the provision of RTPI information which is provided to the new national multi-modal journey planning system (mobile app and website), and which is also displayed on the on-street display signs at bus stops around the country.

### **Upgraded Displays and New Displays Procurement**

In 2021, significant work was undertaken to extend the life of the current 800+ on-street RTPI display signs by upgrading to a supportable platform and moving the associated back office to an accessible cloud-based solution. In 2022 the NTA commenced a procurement competition to ensure continuity of supply of additional on-street display signs, to include additional options such as battery powered displays and displays that can be incorporated into new bus stops.

## **NeTEx**

The NTA has progressed a project on behalf of the Department of Transport covering the creation of a NeTEx profile for Ireland and the development of a NeTEx export interface. The first version of the profile was published in October 2021.

## **Cork City Council**

The ITS Policy adopted by the Council covers Cork City Council's boundary area and intends to have a life of ten years, addressing immediate-term priorities, with a review and update recommended in 2025. The Policy also considers longer-term ITS aspirations as the City grows, to recognise its potential. In addition, it outlines four primary themes on which future initiatives will be based. In tandem with national, regional and local plans for Cork City, an ITS strategy has also been completed which develops the four themes within the policy document and develops strategic objectives for delivery over a 10-year period with an outline budget of €108 million.

In correlation with the Cork Metropolitan Transport strategy and Cork City's ITS strategy, Cork City Council recognise the importance of utilising ITS to service active travel. As CMATS projects are rolled out, there is a recognition that current ITS infrastructure does not always fully cater for active travel services, with significant investment required for both capital projects but also to maintain and secure future service expectations.

## **Dublin City Council (DCC)**

In Dublin City Council (DCC), the SCATS traffic control system and related ITS systems has been deemed an essential service by the Department of Transport and so falls under the NIS directive. The SCATS Traffic control system has continued to be expanded with additional capacity to allow up to 1100 traffic controllers to be centrally controlled. DCC provides central managed traffic services via the SCATS platform to Fingal, Wicklow, Wexford, Waterford and Meath County Councils. The system will be further enhanced in 2024 with the introduction of the Cornerstone software to provide better graphic capability and provision of CITS services.

The EU Interreg project BE-Good has been successfully concluded and two services (HGV Permit Checker and Rate My Signals) under this project are now available to the public. The Rate My Signals application allows DCC to collect information from the public regarding their use of traffic signals and allows non fault information to be provided directly by the public to DCC to better allow them to run traffic signals. The EU Interreg project BE-PROACT is now underway with a number of European partners including Rijkswaterstadt. This aims to be able to maintain DCC's ITS infrastructure by adopting a more proactive approach to maintenance based on deep analysis of the fault records.

Dublin City Council Bus Priority systems, DPTIMS, has been live and operational for a number of years now, and the Go Ahead Bus fleet has now also been added to the system. DPTIMS will form an integral part of how the new Bus Connects corridors will be managed in real time. A new next generation AVL system will be installed on the PT vehicles and DPTIMS will be upgraded to match.

The HGV permit on-line management system which has been operational since 2007 is now being upgraded and new software will be available for this application this year. A transition from the old system to the new is planned to be completed by end of 2023.

THE DCC asset and fault management system has been successfully installed at a number of other locations, including to manage all the TII motorway and road asset ITS infrastructure and provide automatic fault notification, and to provide asset and fault management for Dublin Fire Brigade.

#### **Dún Laoghaire-Rathdown County Council (DLRCC)**

DLRCC have overseen the following ITS equipment increases within the County since 2017:

- CCTV cameras have increased from 65 to 105
- Fibre transmission devices have increased from 98 to 170 devices installed
- GSM connections have increased from 46 to 88
- SCATS licences have increased by 60%

Furthermore, the fibre network cable installed in the ground has increased by over 30km. There are an additional 6 ODF (Optical Distribution Frames) cabinets installed on the fibre network. In addition, projects/developments at the following locations will be coming online shortly and increasing these numbers further: Rock Rd, Clonskeagh Rd, Wyatville Rd, Blackglen Rd, DLR Central, Taney Rd, Glenamuck District Rd Scheme, Stillorgan Park Rd and elements of the Cherrywood development.

#### **Kildare County Council**

Kildare County Council has a Traffic Management Centre, based in Aras Chill Dara, Naas which is staffed during working hours.

#### **Local Government Management Agency (LGMA)**

The Roads Management Office is a shared service operating as a resource for the 31 road authorities and serves to coordinate activities in the areas of technology, standards, best-practice and policy.

The MapRoad Roadworks Licensing system is operational in all 31 local authorities. Additional modules of the system include Works block management, automated processing of license applications subject to condition, and the development of a mobile workforce solution for recording any incidence of defect or breach of conditions.

The Public Road Asset Management system includes a new module to manage the active travel (walking & cycling) network infrastructure. There are also additional tools to record new works and maintenance engineering detail and costings, and a new module to record public lighting stock and survey detail as part of the LED retrofit.

### **1.3 Contact information**

Justin Wallace, Administrative Officer, Driver Traffic and Vehicle Regulations Division, Department of Transport.

Email: [justin.wallace@transport.gov.ie](mailto:justin.wallace@transport.gov.ie)

## 2 Projects, activities and initiatives

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

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

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

#### Transport Infrastructure Ireland

Project/Activities	Description
<b>DATEX II roll out</b>	<p><b>Partners:</b> DoT, 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>
<b>OPEN DATA / SmartCities</b>	<p><b>Partners:</b> DoT, 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>Dublinked: Open Data for the Dublin Region is an important initiative, in line with the eGov Strategy 2012 and the Re-Use of Public Sector Information Directive 2003. It was included in the 2014 Progress Report, and has continued to be developed and expanded since that report. 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 such as Cork City Council, are engaging in actively opening up their data. In collaboration with Cork Institute of Technology, Cork City Council have provided access to real-time data on the availability of parking in the multi-storey car parks and Park'n'Ride facilities in Cork City. The data can be accessed via</p>

	<p><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. The datasets are shared across multiple portals allowing easy access to the data.</p> <p><b>Status:</b> Complete, operational, being developed</p>
<p><b>Real-Time Journey Information</b></p>	<p><b>Partners:</b> TII, Local Authorities</p> <p>TII continue to plan and deploy different Real-Time Journey Information technology on the network. These include upgrading the existing deployments, such as on the M50, renewal and upgrade of existing devices, such as the M1, and new dense deployments, such as the N40 in Cork.</p> <p>Journey time info is provided via VMS, the website <a href="http://tii.traffic.ie">tii.traffic.ie</a> and the Datex II feed. Incident info is provided via VMS and the website and will be added to the Datex II feed later this year.</p> <p>The travel times provided by TII on <a href="http://data.gov.ie">data.gov.ie</a> provide free flow and normal expected travel times for the TEN-T Core motorways M1, M50, M7, M9, and TEN-T comprehensive motorways M6 and M4.</p> <p>Additional Variable message signs deployed since 2020 on the M50 improve the information that is relayed to motorists in regard to safety related events. The source for the data includes CCTV, notification by members of the public via telephone, and notification from incident response staff. Indications are provided by ANPR data, Inductive loop data and data from weather stations.</p> <p>Several other deployments are planned for the Major Inter Urban Routes as part of the TII ITS Implementation plan to supplement</p>

	<p>the existing Real Time Journey Information devices and provide greater granularity in the data that is provided to the traveling public.</p> <p><b>Status:</b> on going</p>
<p><b>Improvements to Light Rail (Luas) RTPI</b></p>	<p><b>Partners:</b> TII  <b>Site:</b> <a href="https://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> <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 RTPI 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.</p> <p>This system has worked well since early bugs were resolved. The distributed smartphone software was upgraded in 2019 and 2020 to continue consistent performance with new versions of Android and Apple operating systems.</p> <p><b>Status:</b> Complete, Operational</p>
<p><b>N40 ITS Deployment</b></p>	<p><b>Partners:</b> TII, Cork County Council</p> <p>The deployment of ITS equipment on the N40 and ancillary roads around Cork City will increase the efficiency and optimisation of the road’s operation. The aim of the project was to implement an ITS scheme that will support an effective and real-time monitored road, while ensuring the protection of its strategic core function</p> <p>The project also aims to support the management and the mitigation of the safety and reliability impacts that result from the current congested conditions, which are currently threatening the strategic function of the N40. Moreover, managing the capacity in</p>

	<p>a physically constrained road as N40 will be fundamental to tackle the Cork area’s forecasted population growth in the coming years and its consequent future traffic demand.</p> <p>The deployment of ITS equipment on the N40 and ancillary roads around Cork City is focused on the three following priorities:</p> <ul style="list-style-type: none"> <li>• Allow the <b>traffic management</b> and strategic management of the N40 road infrastructure;</li> <li>• Implement a robust network of <b>Incident Detection</b> on the N40 that will improve road safety, lower response times and chock-wave impacts on the road infrastructure;</li> <li>• Allow the provision of <b>real-time road network information</b>, which allows the management of diversions and permits informed decisions by users when facing congestion, incidents, weather adversities, road closures and other situations.</li> </ul> <p><b>Status:</b> complete</p>
<p><b>Average Speed Enforcement Pilot on the M7</b></p>	<p><b>Partners:</b> TII</p> <p>The implementation of ANPR cameras and specialized software for an average speed enforcement trial along the M7 serves a crucial purpose. The primary objective of this initiative is to enhance the safety measures at a particular location that has frequently experienced weather-related and micro-climate events, primarily hailstorms. These events have unfortunately led to a rise in the frequency of collisions within this area.</p> <p>Conceived as a pilot project, its core focus was to evaluate the system's performance and gauge its effectiveness in elevating safety standards. On the significant date of April 25, 2022, a pioneering mainline Average Speed Safety Camera system was successfully launched along a 9km stretch of the M7, specifically between Junction 26 and Junction 27. This innovative system operates in both eastbound and westbound directions, thereby encompassing a substantial area of travel.</p> <p><b>Status:</b> Complete, operational</p>
<p><b>Dunkettle Advanced (DKA) ITS Deployment</b></p>	<p><b>Partners:</b> TII, Cork County Council</p> <p>The deployment of ITS equipment as part of the Dunkettle Advanced works focused on the road network leading into and around the Jack Lynch Tunnel in Cork. The aim of the project was to implement an ITS scheme that will support an effective and real-time monitored road, while ensuring the protection of its strategic core function. For the DKA scheme there was focus on identifying Overheight Vehicles which may be heading for the Jack Lynch Tunnel and safely diverting them away from the Tunnel without disrupting traffic.</p> <p>The project also aims to support the management and the mitigation of the safety and reliability impacts that result from the current congested conditions around the Dunkettle Interchange,</p>

	<p>which are currently threatening the strategic function of the road network in the area whilst also providing information to motorists regarding the construction work being undertaken on the new Dunkettle Interchange. Moreover, managing the capacity in a physically constrained road network around the Jack Lynch Tunnel will be fundamental to tackling Cork’s forecasted population growth in the coming years and its consequent future traffic demand.</p> <p>The deployment of ITS equipment on the DKA scheme is focused on the following priorities:</p> <ul style="list-style-type: none"> <li>• Allow the <b>traffic management</b> and strategic management of the road infrastructure;</li> <li>• Implement a robust network of <b>Incident Detection</b> on the road network around the Dunkettle Interchange that will improve road safety, lower response times and shock-wave impacts on the road infrastructure;</li> <li>• Allow the provision of <b>real-time road network information</b>, which allows the management of construction works, diversions and permits informed decisions by users when facing congestion, incidents, weather adversities, road closures and other situations.</li> <li>• Identify Overheight vehicles which are heading for the Jack Lynch Tunnel</li> </ul> <p><b>Status:</b> Complete</p>
<p><b>Dunkettle Interchange (DKI) ITS Deployment</b></p>	<p><b>Partners:</b> TII, Cork County Council</p> <p>The deployment of ITS equipment as part of the Dunkettle Interchange (DKI) main works focused on the road network which is being constructed replacing the Dunkettle Roundabout with a free flow interchange. The aim of the project was to implement an ITS scheme that will support an effective and real-time monitored road, while ensuring the protection of its strategic core function. Much like the DKA scheme, the DKI scheme has a focus on identifying Overheight Vehicles which may be heading for the Jack Lynch Tunnel and safely diverting them away from the Tunnel without disrupting traffic.</p> <p>The project also aims to support the management and the mitigation of the safety and reliability impacts that result from the large volume of traffic which will use the Dunkettle Interchange each day. Moreover, managing the capacity in a physical constrained road network around the Jack Lynch Tunnel will be fundamental to tackling Cork’s forecasted population growth in the coming years and its consequent future traffic demand.</p> <p>The deployment of ITS equipment on the DKI scheme is focused on the following priorities:</p> <ul style="list-style-type: none"> <li>• Allow the <b>traffic management</b> and strategic management of the road infrastructure;</li> </ul>

	<ul style="list-style-type: none"> <li>• Implement a robust network of <b>Incident Detection</b> on the road network around the Dunkettle Interchange that will improve road safety, lower response times and shock-wave impacts on the road infrastructure;</li> <li>• Allow the provision of <b>real-time road network information</b>, which allows the management of construction works and diversions; and enables informed decisions by users when facing congestion, incidents, weather adversities, road closures and other situations.</li> <li>• Identify Overheight vehicles which are heading for the Jack Lynch Tunnel</li> </ul> <p><b>Status:</b> Ongoing</p>
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### Cork City Council

Cork City Council’s ITS Policy and Strategy have been developed while the strategy objectives A to K are ongoing, as described in 2.1.2.

### Dublin City Council (DCC)

DCC have designed and overseen the development and deployment of a centralised Bus priority system (DPTIMS) which integrates real time data from the Dublin Bus fleet with the SCATS traffic control system in Dublin. This system has now been operational since 2017 with dedicated staff resources to manage on a day-to-day basis how the bus fleet interacts with the traffic signals across Dublin.

This project allows DCC to continuously evaluate all road segments in Dublin for bus journey times, delays congestion, time at stops etc. However, it also allows that once areas of delay and congestion for the bus network have been identified, remedial measures including traffic signal changes, new infrastructure, new road markings etc. can be implemented.

This approach will be integral to how the new Bus Connects corridors will be managed in real time, and a new control centre co-located with An Garda Síochána is currently being developed by DCC and the NTA with the aim of managing journey times on the bus network in a more comprehensive fashion. A major project is underway to upgrade the AVL system on-board the bus fleet to the Next Generation AVL and the DPTIMS system will also be upgraded to allow for faster data processing to handle a much-increased accuracy of the new system and with the ability to better handle multiple bus inputs. The system has been expanded from just the Dublin Bus fleet to now be integrated in the Go Ahead bus fleet as well.

In tandem with this project, DCC is engaged in how to dynamically manage sections of bus corridors where no physical priority is available. The use of various types of detectors from loop- to radar-based detection is currently being evaluated.

DCC have undertaken work at a number of large junctions in the city using Smart Micros to enhance safety for cyclists. This allows for the introduction of longer all red times at junctions if a cyclist is detected during the shutting down of a phase.

DCC designed and oversaw the development of a Fault Management system linked to its various different ITS platforms. This system automatically raises faults with different contractors and tracks the life cycle of a fault until the fault has been cleared. The system is multi-user and multi-contractor so it acts as a central platform for all ITS systems in DCC. This system is owned by DCC but has now been successfully deployed

and enhanced to TII to cover the ITS infrastructure and act as a fault management and asset management tool for TII's entire ITS infrastructure. The system has now also been extended to Dublin Fire Brigade and is also used in the Mersey Tunnel.

DCC, as part of the BE-Good Interreg project, launched a Rate My Signals application to allow the public to provide non-fault related information to DCC about how they rate their experiences with traffic signals. This allows all users from car drivers, pedestrians, cyclists and in particular any mobility- or visually-impaired users to raise specific issues with DCC via this platform.

### **Dún Laoghaire-Rathdown County Council (DLRCC)**

The vastly expanded use of smart phones by trip makers has reduced DLRCC's need to provide real-time journey information. The use of Transport for Ireland's (TfI's) journey planner for public transport, TII's traffic information (for travel on National routes) and Google Maps for all modes of transport has made any work by the Council redundant.

### **Fingal County Council**

Fingal County Council are hoping to build a traffic control room and are awaiting an engineering resource to progress this.

### **Kildare County Council**

Kildare County Council implements remote monitoring within the Traffic Management Centre for signalised junctions in both urban and rural environments along with CCTV cameras for traffic management purposes and provision of Driver Speed Information Feed Back Signs.

### **Limerick City and County Council (LC&CC)**

#### Adaptive Urban Traffic Control (AUTC)

Limerick City and County Council have operated an Adaptive Urban Traffic Control system since 2003. This system includes both SCOOT traffic control and MOVA controlled junctions covering a large portion of the metropolitan road network. The system components also include UTC, Fault Management, Remote Management and bus priority. These systems are managed from a dedicated Traffic Management Centre. There are approximately 70 traffic signal controllers connected to the LC&CC urban traffic control system (for control, monitoring or both). Each of these sites gathers data in relation to traffic volumes and can provide congestion and incident detection capabilities. Additionally, there are 20 MOVA controlled traffic signal junctions on the metropolitan network. These sites also gather data from the road network including traffic volumes, congestion and incident detection. The AUTC relies on a communication network to provide control centre to site and site-to-site communications. This network has been upgraded to a digital system. LC&CC has undertaken a programme to upgrade the communications network to fibre optic cable where possible and this is now completed.

#### CCTV

Limerick City & County Council's metropolitan area CCTV system is linked to the AUTC system. There are approximately 32 ITS related CCTV cameras deployed on the metropolitan network. Due to General Data Protection Regulations, LC&CC cannot access any footage from these cameras, and this is expected to remain the case until legislation is introduced to allow this use of CCTV cameras.

### Parking Guidance System and Variable Message Signage (VMS)

A parking guidance system within Limerick city centre was developed and installed in 2012. This comprises static, semi-static and fully variable message signs (VMS). There are approximately 27 semi-static parking guidance signs currently deployed. There are also approximately 10 VMS deployed on the network. These are primarily located on the approaches to the city centre.

### E-Parking

The Limerick City e-Parking initiative currently has 41,343 customers. The system permits parking to be purchased over the phone or through a mobile application. All on-street parking spaces within the metropolitan area are payable via e-parking which equates to approximately 4169 spaces. Currently, approximately 73% of LC&CC parking transactions are performed through an e-parking phone application. In addition to this, approximately 5,264 (privately operated) off-street parking spaces are also within the system. A pre-booking facility is also available for motorists to book and pay for parking in advance. It is expected that the number of off-street parking facilities served by this system will extend over the coming years.

### Driver Feedback Signage

Driver feedback signs have been deployed by LC&CC in 18 locations within the metropolitan area (down from 20 in 2019). These signs record vehicular speed and display a message to the driver of the vehicle indicating their speed or compliance with speed limits. These signs also record the speeds of each vehicle detected.

### **Local Government Management Agency (LGMA)**

The LGMA delivers a nationally standard and consistent asset management and road opening licensing system across the entire public road network. The system is centrally hosted and records information on public road network asset, condition and structural performance of the network as well as location of road openings arising from statutory undertaker works, e.g. works performed by utility and telecoms companies.

## **2.1.2 Progress since 2020**

### Description of the progress in the area since 2020:

#### **Transport Infrastructure Ireland**

As described in 2.1.1.

#### **Cork City Council (CCC)**

Cork City Council's ITS Policy was adopted on 21 December 2020. Cork's ITS Strategic vision is underpinned by four key themes, identified in the ITS Policy, which address the priorities for planning and delivering ITS in Cork. The four key themes help to deliver on the CMATS principles, including those that address safety, efficiency, sustainability, and connectivity. Contingent on budgetary and staffing recruitments, it is envisaged that Cork City Council will work towards the following principles: 1) Proactive and Responsive Mobility Management, 2) Intelligent data collection and use, 3) Emerging Technology and 4) People and Process. Each Strategy objective outlines strategy objectives A to K which will require both additional staff and financial support to achieve. These objectives are grouped as follows:

Physical Infrastructure

Strategy A –Level of service for ITS sites

Strategy B - Large Scale SCOOT Deployment for Bus Connects

Strategy C - Develop Technical Requirements Brief for systems

Network Management

Strategy G - Proactive and responsive network management capability

New Strategy L – H with emerging Tech - Creating a sustainable approach to network management

Digital Infrastructure

Strategy D - Data as an asset

Strategy E - Making Data Work for all

Strategy F - A Comms Network that is fit for purpose

Emerging Technology

Strategy H - Positioning Cork for emerging mobility

Strategy I - Positioning Cork for emerging mobility

People and Process

Strategy J - Empowering staff to grow and develop

Strategy K - Develop a process for ITS Integration with Transport projects (CMATS)

Cork City has commenced the development of selected strategy objectives-based capital funding received from the NTA. For example, Cork City Urban Traffic Control Section is responsible for the design, maintenance, control, efficiency, and safe operation of all Intelligent Transport Systems (ITS) equipment in the City of Cork. The Section manages the infrastructure in the areas of Urban Traffic Control (UTC), Public lighting, Signing and Lining, and Electrical support services.

As the information on the environmental impact of vehicles on the streets becomes more widespread, in addition to traffic jams, ITS is being used to encourage more citizens to turn to more sustainable modes of transport, and cycling is one of them. Cork City’s current trip categorisation by mode is as follows:



## Cycling demand

To encourage greater numbers of people to use cycling as a form of transport, along with providing dedicated cycling lanes, CCC wanted to ensure that cyclists who may not be on a dedicated cycling lane are considered at junctions and able to navigate a signalised junction safely. To enable this, CCC has begun installing additional detection technology at identified junctions to ensure cyclists are detected and counted which, in turn, alters the green phase of the traffic signals at a junction allowing the cyclist to continue their journey safely. The implementation of this solution will increase cyclist safety, make cycling more attractive and reduce traffic congestion and transport-related environmental impacts.

Figure 1 shows the primary cycle routes in Cork City. All primary cycle routes were analysed to identify high-priority cycle routes.

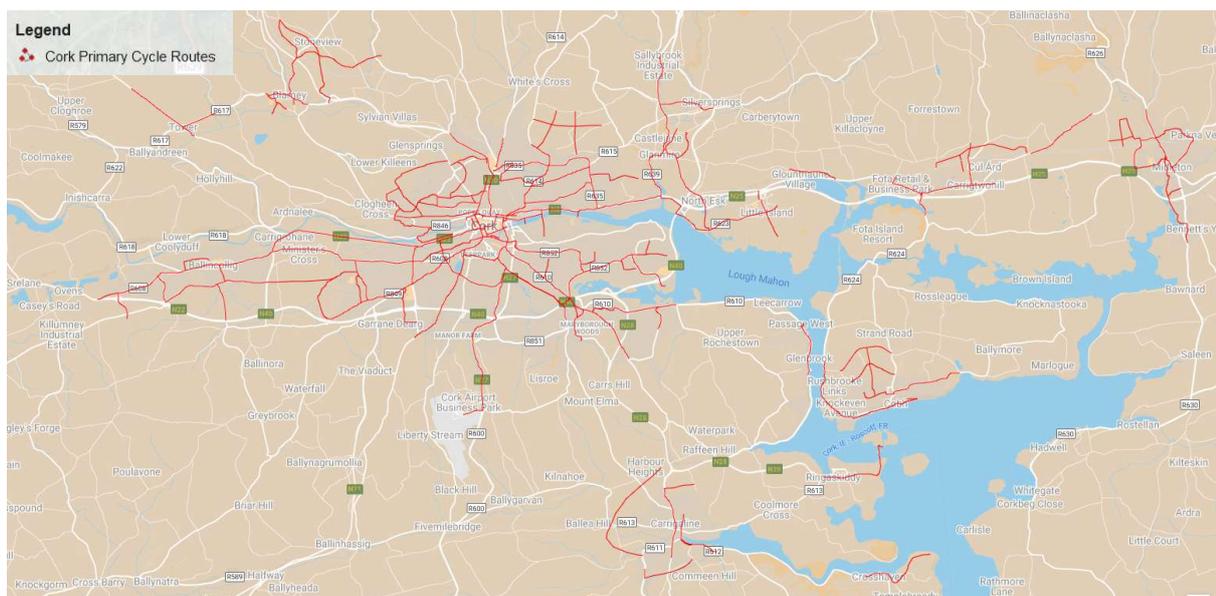


Figure 1: Cork City Primary Cycle Routes

Critical routes connecting the west, north, east, and south parts of the city to the “Island” were identified for the first stage.

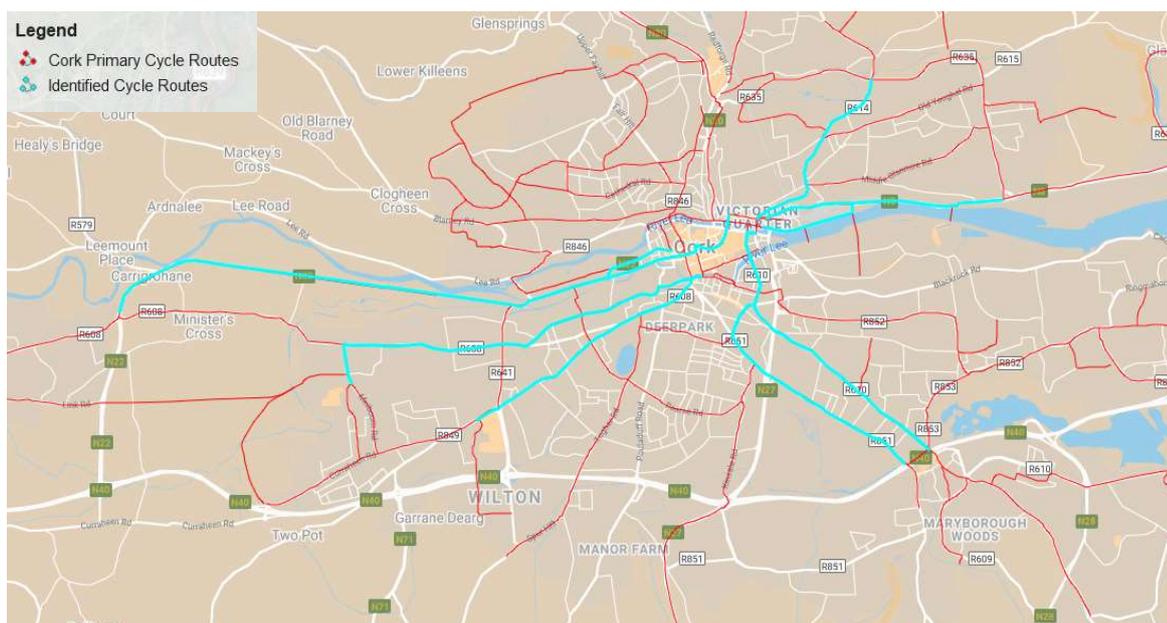


Figure 2: The identified Cycle Routes for Cork Cycle Detection Project

In total, 98 junctions on the identified cycle routes were analysed. 32 junctions were selected to be equipped with cycle detectors. The details regarding the junction selection process are given in the next section.

Table 1: Junction analysis

Total number of analysed junctions on the identified cycle routes	98
Selected Junctions to be equipped with detector systems	32
Pedestrian crossing junctions	36
Remaining Junctions	26

Multi-lane Radar and Thermal Imaging technologies were recommended for detection and counting. The technologies are suitable for both dedicated/segregated cycle lanes and mixed traffic lanes. Cork City Council proposed (to NTA) to provide bicycle detection at 185 junctions, as well as some with bicycle counters. This is proposed to be delivered over three stages, 1) city centre junctions, 2) outer urban junctions, and 3) municipal area junctions. The ITS Section has installed cycle detection/counting equipment at 25 junctions throughout the city. This enables cyclists to call a demand to a traffic controller and also allows for the counting of cyclists at certain junctions. The project will continue in line with available capital funding availability.

#### Pedestrian demand harmonisation

Due to the age of certain installations, vulnerable and visually impaired road users have highlighted issues with pushbuttons at pedestrian crossings across the City. After an initial survey was completed on the pedestrian crossings for vulnerable road users, the issues found to be below standard include: No Sounder on push button at site, wait lamps not working, Brail missing or incorrectly placed on pushbutton, Vibration not working.

In consultation with the NTA, particular sites were found to be unharmonized to best practice. Upgrading these sites, including the replacement of legacy pushbuttons to ensure compliance and uniformity across all sites in Cork City for vulnerable and visually impaired road users has been ongoing through the NTA-funded active travel project. These facilities will improve pedestrian demand services as they navigate their way around Cork City and its surrounding environments.

#### City Street Pedestrianisation

Cork City Council has pedestrianised selected city centre streets utilising automatic sub-terrain Bollards. The installation of these electro-mechanical sites has increased the compliance of the pedestrianised area by physical barriers between time-plated signs. This initiative supports the local economy and changes the use of these streets for both residents and the public who are living and working in the city centre and town centres. 12 sites currently have Automatic Bollards installed.

### Road Lighting upgrade project

The Cork City Council LED upgrade project involved the upgrade of old inefficient sodium lanterns (SOX and SON) with new LED lanterns. CCC manages circa 25,000 public lighting (PL) lanterns on its PL network. Cork City Council installed 3,021 new LED lanterns in 2022 replacing old inefficient sodium lamps (SOX and SON), this equated to just over 12% of the overall inventory.

This project is using the latest technology in terms of LED lanterns replacing old sodium lanterns (SOX and SON) while also implementing better dimming profiles. The project also includes the latest photocell which has a 35/18 lux switching regime to replace the old photocell which had a 70/35lux switching regime. This reduces the burning hours of the lanterns from 4,150 hours to 4,000 hours, which equates to a 3.6% saving on each lantern's burning hours. Dimming and trimming profiles are factory set into lanterns so that the lantern dims to 75% of the original output between midnight and 6 am to provide additional savings.

CCC implemented a pilot lighting control scheme on a newly refurbished greenway within Cork City in 2022 to trial a cloud base smart adaptive lighting control system. The project comprised many lanterns incorporating inbuilt Passive Infrared (PIR) motion detection placed at strategic locations along the length of the Greenway. Through the smart lighting control system, many lanterns local to the lanterns with the PIR sensor were grouped around it. This allowed Cork City Council to programme the system so that during the hours of midnight to 6 am when the greenway would be least used, the lanterns would dim down to 10% of their original output, the lanterns would then raise back up to 75% output once a person walked under a lantern with the inbuilt PIR motion detection. Monitoring of the energy used in this scheme will be carried out in 2023 to understand the actual kWhr saving the smart lighting control system can provide.

The flexibility allowed from being able to programme this smart lighting control system to dim down to 10% and then rise back up to 75% (in line with the U14 dimming profile) ensuring that persons using the greenway during this time frame would not be walking into dark areas thus making the greenway safer to walk along. The smart lighting control also allowed CCC to change parameters such as switch on/off times and adjust lighting output up or down from a desktop remotely based on feedback from the general public once the greenway was open to the general public. The reduced lighting output from midnight to 6 am will also have a beneficial effect on the local nocturnal wildlife.

CCC has reduced the average billable wattage of the PL network from 98.9 watts in March 2021 down to 82.9 watts in February 2023. Over these 2 years that is a 16% reduction in the average bill wattage for the overall public lighting network. The above work shows the potential of incorporating these LED upgrade projects within the overall maintenance contract for the public lighting networks.

### **Dublin City Council (DCC)**

As described in 2.1.1.

### **Kildare County Council**

Kildare County Council has seen the following increases in infrastructure: Monitored Signalised Junctions from 87-95 sites; Monitored Signalised Pedestrian Crossings from 101-136 sites; 114 CCTV monitoring sites with upgrading of software and communication network; and Driver Feed Back Signs.

## Limerick City and County Council (LC&CC)

### Adaptive Urban Traffic Control

No new MOVA controlled traffic signal junctions were installed on the regional road network and metropolitan area. Fibre optic services were expanded into the area.

Subject to funding, end of life UTC is being upgraded, including traffic signal controller upgrades and revalidation of individual sites and cells. All analogue communication network equipment has been replaced with digital systems. The Remote Monitoring Service (RMS) via sim cards is being phased out (it is still operational at present), and the sim card service provided has changed from Vodafone to Three. As works allow, extension of the fibre optic network has been carried out with almost 90% completed in the City Centre in the Central Business District area.

Annual maintenance, upgrade and replacement of Traffic Signal Control and its equipment comprises a significant amount of the maintenance works. The number of traffic-controlled sites within the metropolitan area requires continued maintenance and preventative maintenance. LC&CC have also provided traffic signal equipment replacement at a number of sites. As deployed equipment reaches its end-of-life state, replacement equipment is provided as necessary, but this is subject to funding being available. Additional funding is currently required to allow the replacement of end-of-life equipment.

Bus detection is currently linked to the UTC system using loops. LC&CC will rebuild the bus detection system at selected locations of the Metropolitan Area subject to Bus Connects, Active Travel and the bus fleet.

*Table 2 – Approximate AUTC Spending by LC&CC 2020-2022*

ITS Activity	Annual Spending		
	2020	2021	2022
<b>Adaptive Urban Traffic Control</b>			
- UTC Upgrade	€80,000	€70,000	€60,000
- Communications Network	€35,000	€35,000	€35,000
- Traffic Signal Maintenance	€93,000	€94,000	€95,600
- New Traffic Signal Equipment	€0	€35,000	€35,000

### Variable Message Signs (VMS) and Parking Guidance Signs (PGS)

No additional VMS (or PGS) were installed between 2020 and 2022. The VMS system has not been expanded since 2014. The maintenance of VMS and PGS systems have incurred an annual cost of €32,000 for the last three years.

*Table 3 – Approximate VMS and PGS Spending by LC&CC 2020-2022*

ITS Activity	Annual Spending		
	2020	2021	2022
<b>VMS and PGS</b>			
- New VMS	€0	€0	€0
- Operation and Maintenance	€32,000	€32,000	€32,000

## E-Parking

E-parking is currently in use for 4,169 on-street parking spaces in the Limerick Metropolitan Area, as well as spaces in 17 off-street car parks in the city. Approximately 73% of parking transactions are currently carried out via e-parking. LC&CC have deployed Ireland's first real time system for locating and navigating to accessible parking spaces. Users of the Limerick e-Parking service can use the system to locate accessible parking and when used in conjunction with an Apple CarPlay vehicle entertainment system, the service provides real time navigation to the nearest accessible space. This is achieved by the use of parking sensors at each parking space. 6 electrical vehicle charging sites (12 spaces in total) have been provided, these also have been fitted with parking sensors. LC&CC have engaged two service providers of the e-Parking system (back-end system and transaction and court service processing). An additional cost is incurred per annum for operations and maintenance of e-parking systems, including the upgrade of handheld and radio systems.

*Table 4 – Approximate E-Parking Spending by LC&CC 2020-2022*

ITS Activity	Annual Spending		
	2020	2021	2022
<b>E-Parking</b>			
- Operation and Transaction	€75,000	€75,000	€105,000
- CIT system	€20,000	€20,000	€20,000
- Ops, maintenance and upgrade of Handheld and radio systems	€26,000	€27,000	€28,000

## Driver Feedback Signage

One new driver feedback sign has been provided by LC&CC in 2021. Driver feedback signs are deployed across 11 locations within the metropolitan area. These signs record vehicular speed and display a message to the driver of the vehicle indicating their speed or compliance with speed limits.

*Table 5 – Approximate DFS Spending by LC&CC 2020- 2022*

ITS Activity	Annual Spending		
	2020	2021	2022
Driver Feedback Signage	€0	€6,000	€0

## **Local Government Management Agency (LGMA)**

Systems that can record more engineering detail on the maintenance and improvement works carried out on the public road network and works carried out on the national road network are now catered for in the system.

A new module now caters for the addition of the active travel network to the database of public roads.

The Road Management Office (RMO) shared service is undertaking a procurement exercise to make traffic and speed data available to local authorities for use in the management of the public road network.

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

Ireland's Open Data Portal, located at: <https://data.gov.ie>, serves as the National Access Point (NAP). This National Access Point serves each of the Delegated Regulations.

The Open Data Portal is hosted by the Irish Department of Public Expenditure, NDP Delivery and Reform and has been continuously updated since 2020. The NTA publishes 15 transport-related datasets on the portal, six of which are available via APIs. Included in these datasets is the Irish profile NetEx and information about public transport services and infrastructure in Ireland, including GTFS (General Transit Feed Specification) real-time arrivals and departures (see below for more details), National Public Transport Access Nodes (NaPTAN) dataset containing detailed information of all public bus stops in the Republic of Ireland, as well as transport operator schedules (timetable data).

The full list of NTA datasets is as follows:

- National Public Transport Access Nodes (NaPTAN)
- Operator GTFS Schedule files
- Realtime Passenger Information (GTFSR)
- Transport Operator VDV 452 Data
- National Public Transport Gazetteer (NPTG)
- Public Transport Infrastructure Management System (PTIMS)
- Cycletrack & Buslane Survey Greater Dublin Area
- GDA Cycle Network Survey
- Greater Dublin Area Cycle Infrastructure
- Projected Cycle Lanes
- Cycle Counters
- Netex - Irish Profile
- THA24 - Passenger Journeys by Public Transport
- Public Transport Schedules and Stops
- Rural Transport Routes

#### Information on the progress made since 1 December 2022:

In March 2023, an updated GTFS v2 real-time API was made available for anyone to use. GTFS Real time is a feed specification that allows NTA to provide real time updates to application developers. It is an extension to GTFS (General Transit Feed Specification), an open data format for public transportation schedules and associated geographic information. GTFS Real time was designed around ease of implementation, good GTFS interoperability and a focus on passenger information. The GTFS API contains real-time updates for services provided by Dublin Bus, Bus Éireann, and Go-Ahead Ireland. The data in this feed can be used in conjunction with the GTFS Static specification to provide schedule details for the real-time data.

The introduction of this new API was widely publicised on social media and is supported by an NTA API developer portal, available at: <https://developer.nationaltransport.ie>.

### **New Travel Information Systems and Services (TISS)**

The NTA also completed a procurement process to secure a supplier for Travel Information Systems and Services (TISS), which includes the provision of a new national multi-modal journey planning system (mobile app and website) covering all modes of public transport (bus, rail, tram) and including Real Time Passenger Information (RTPI). Included in this contract is the capability to export NeTEx data. The first version of this solution, called “TFI Live” was launched at the end of Q1 2023. TFI Live can be downloaded from Google and Apple app stores and is available online at <https://www.transportforireland.ie/>. Key features include:

- Access real-time departure information for Bus Éireann, Dublin Bus, Go Ahead Ireland, Luas and Iarnród Éireann Irish Rail services
- Select your origin and destination to find the best route for your journey
- Search for timetables and maps
- Save your favourite journeys, departures and timetables

Future enhancements are likely to see the inclusion of bike share schemes and other mobility providers.

### **New Automatic Vehicle Location (AVL)**

There are five AVL systems currently used on PSO bus services nationwide. These current AVL systems are approaching end of life and in 2021 the NTA commenced a public procurement competition to find a single supplier of a modern system to replace and consolidate the variety of systems currently in place, as well as providing a low-cost option for smaller private bus operators to participate and have their location information appear in the TFI Live app and on the on-street RTPI Displays.

AVL is required for service control of buses, communications with drivers, tracking of route performance, generation of real time passenger information for on-street displays and mobile apps and is at the core of the contract management function of the NTA in tracking kilometres operated and punctuality by operator by route.

In addition, AVL is critical in the operation of Traffic Light Priority (TLP) systems. NTA’s new AVL solution will provide more frequent updates to Dublin City Council, who operate the TLP system in Dublin.

During 2022, customers experienced a number of issues with the quality of real time data. One of the root causes was that there are functional discrepancies between the 5 different AVL systems and in that regard one of the most impactful actions will be to the sourcing of a new single AVL system, which shall ensure a single consistent source of real time data in a single data feed and single format.

In 2021 the NTA shortlisted 5 bidders, and in 2022 the Authority contacted clients of the bidders, and also held discussions with the five shortlisted bidders on key aspect of the NTA’s functional requirements. In May 2022 the NTA issued the final tender with the intention of awarding the contract by the end of 2023.

## Upgraded Displays and New Displays Procurement

In 2021, significant work was undertaken to extend the life of the current 800+ on-street RTPi display signs by upgrading to a supportable platform and moving the associated back office to a more resilient cloud-based solution. In addition, the NTA took advantage of an Office of Government Procurement framework for mobile data services to upgrade all of the SIM cards in the on-street signs, delivering a more efficient solution for the RTPi data being transmitted to the signs from the new cloud-based data management system.

The Authority commenced a procurement competition in 2022 to source a new supply of modern on-street display signs, to include more sustainable solutions such as battery powered displays and displays that can be incorporated into new bus stops. This procurement is nearing completion and will be used to source displays for bus stops that are being constructed as part of the BusConnects initiatives covering cities including Dublin, Cork, Galway and Limerick.

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

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:

### **Local Government Management Agency (LGMA)**

The sector is putting in place a procedure to manage the sharing of the public road schedule on the appropriate OpenData platforms. This will be done as a service for all 31 local authorities.

Linking of travel information services:

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

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

Additional information (e.g. have metadata catalogues been implemented?):

In parallel with the implementation of the new TFI Live app, NTA has added additional data managers to validate and improve the accuracy of the data that is published on the NAP.

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

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

Progress made in terms of the accessibility, exchange and re-use of the road and traffic data types set out in the Annex:

The Open Data Portal hosted by the Irish Department of Public Expenditure and Reform – [www.data.gov.ie](http://www.data.gov.ie) – serves as the National Access Point. This National Access Point serves each of the Delegated Regulations. 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. 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.

Travel times, incidents, roadworks, and weather information are currently provided to the public website TII Traffic Map.

### **Modalities of Functioning of National Access Point**

The technical framework which underpins the publication of open datasets can be found at <https://data.gov.ie/pages/opendatatechnicalframework>.

### **Real-Time Traffic Information**

The open data portal is arranged thematically. The transport theme has 429 datasets, of which some examples are provided below. All of the data referred to below can be accessed at [www.data.gov.ie](http://www.data.gov.ie).

#### NTA

Datasets include:

- Irish Rail
- Luas tram/light rail Dublin city
- Dublin Bus
- Private Bus timetables for Ireland
- Rural transport routes
- Real-time Passenger Information (RTPI) for Dublin Bus, Bus Éireann, Luas and Irish Rail

#### TII

Datasets include:

- National Road Vehicle Detection Systems
- National Road Variable Messaging Signs
- National Roads Weather Station Data
- National Roads Travel Times
- Traffic on National Roads
- National Road Traffic Counts
- Marker Plates - location referencing system on the national network
- National Road Network Sinuosity Index
- Skid Resistance on National Roads

#### Dublin City Council

Datasets include:

- Dublin Bikes real-time and static data
- Dublin City Public Cycle Parking Stands
- On Street Disabled Parking Bay in Dublin City Council area
- Parking meters location tariffs and zones in Dublin City
- Dublin City Strategic Cycle Network
- Dublin Bus GPS sample data from Dublin City Council (Insight project)
- Multi Storey Car Parking Space Availability
- Street Lighting Dublin City
- Suspension of on-street Parking Bays to facilitate events, road works, skips, construction works

### Dún Laoghaire-Rathdown County Council

Datasets include:

- DLR Parking Tag Information
- Parking Areas and Tag Meters in DLRCC
- DLR Commercial Parking Locations, Numbers and Charges
- DLR County Council Parking Meters

Geographical scope and the road and traffic 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:

Results of the assessment of compliance referred to in Article 11 with the requirements set out in Articles 3 to 10:

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

Where relevant, a description of changes to the priority zones:

Additional information (e.g. which data types are being provided? Have metadata catalogues been implemented? Are quality requirements being checked?):

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

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

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

Universal traffic information gathered by TII is made available to the National Access Point, 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:

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

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

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

### 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:

#### Transport Infrastructure Ireland (TII)

Project/Activities	Description
<p><b>Interoperable System for Electronic Tolling (Interoperability Management Platform)</b></p>	<p><b>Partners:</b> TII</p> <p>The Interoperability Management Platform (IMP) facilitates tolling interoperability in Ireland. Its function has been extended during this period and has been a key component in the delivery of 2 new Irish initiatives such as the 'Low Emission's Vehicle Toll Incentive' (LEVTI) and the 'Disability Toll Exemption Scheme (DTES) (referenced under "Other initiatives"). These initiatives would not have been possible without the interoperability technical and contractual frameworks that are currently in place.</p> <p>Other works that have been undertaken include the creation of an IMSP Data Lake, which pseudo-anonymises toll interoperability data for ongoing archiving and is then made available for various research and analytics initiatives that are currently underway.</p> <p>The transition from the old IMSP (2nd generation interoperability platform) to the new IMP (3rd generation interoperability platform) was completed in February 2023, following a procurement and implementation project on behalf of Transport Infrastructure Ireland. The new platform includes certain enhancements, including compatibility with EFC standards and enabling of ANPR transactions, thus facilitating closer compliance with EETS.</p> <p><b>Status:</b> Complete, Operational</p>
<p><b>Toll System Renewals and Upgrades</b></p>	<p><b>Partners:</b> TII, DCC, PPP companies</p> <p>There continue to be 11 toll chargers and four toll service providers in Ireland, with ongoing enquiries from EETS Providers looking to join the market. The various road operators continue to manage and operate their own roads and operations according to their own contract restraints / requirements.</p> <p>Transport Infrastructure Ireland (TII) are responsible for the M50 and Dublin Tunnel toll systems. The operations of both systems have been outsourced.</p>

	<p>TII are undertaking a significant upgrade / replacement of the Dublin Tunnel toll systems, with the implementation of a New Tolling System enabling the pre-classification and identification of vehicles approaching the toll barriers currently underway following earlier phases of optioneering, design and procurement. Gantries with toll equipment will be located in advance of the toll barriers such that exempt and pre-paid vehicles will be identified and the barrier will lift automatically. This will mean that such vehicles will not have to slow down or stop, while the barrier will stay down for vehicles for which a toll payment is due. This project is planned to be complete in Autumn 2024.</p> <p>Separate to the TII related systems, various PPP companies have upgraded their back-office systems and some Roadside Equipment in accordance with their own maintenance plans.</p> <p><b>Status:</b> Complete, Operational</p>
<b>CCTV Cameras</b>	<p><b>Partners:</b> TII, Local Authorities</p> <p>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. Upgrade of CCTV control systems has been undertaken across local authorities in recent years.</p> <p><b>Status:</b> Complete, Operational, and being developed</p>

## Limerick City and County Council (LC&CC)

### Freight

The central area of Limerick City is unsuitable for heavy goods traffic and should be restricted to only those vehicles of a suitable size with an origin or destination in the centre. The Limerick Shannon Metropolitan Area Transport Strategy (LSMATS) proposes further possible restriction of the movement of HGVs within the existing urban footprint of Limerick City and Suburbs.

### Vehicle Access Control

LC&CC operate a vehicle access control system which provides access to pedestrianized streets for appropriate services while restricting access to non-essential services. The system records which commercial vehicles access the area, the times and frequency of use.

### Adaptive Urban Traffic Control (AUTC)

Traffic Management within the Limerick Metropolitan Area is managed through the LC&CC AUTC system. This has been addressed in Section 2.1 above including annual spending undertaken.

### 2.2.2 Progress since 2020

Description of the progress in the area since 2020:

#### Limerick City and County Council (LC&CC)

##### Vehicle Access Control

LC&CC operate a vehicle access control system which provides access to pedestrianized streets for appropriate services while restricting access to non-essential services. The system records which commercial vehicles access the area, including time and frequency of use. The spending undertaken by LC&CC during 2020-2022 is related to maintenance of existing hardware and software and street apparatus.

*Table 6 – Approximate Vehicle Access Control Spending by LC&CC 2020-2022*

ITS Activity	Annual Spending		
	2020	2021	2022
Vehicle Access Control Maintenance	€25,000	€25,000	€25,000

No additional pedestrianised streets or retractable bollards have been installed in the city centre since 2014, however if further streets were to be pedestrianised and retractable bollards installed, the cost of maintenance would likely increase.

## 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:

#### Transport Infrastructure Ireland (TII)

Project/Activities	Description
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<p><b>Variable Message Signs</b></p>	<p><b>Partners:</b> TII, 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.</p> <p>During the period of 2017-2019, 14 new VMS were deployed in the National Road Network (M7; M18; N11; N31; R118). In addition to these deployed VMS, TII also commenced the design of additional deployments including M50 eMOS (65), N40 (14), and 2020 MIU ITS Deployment (16). During this period TII further investigated the use of existing Advanced Directional Signage infrastructure for the mounting of customised Tactical VMS.</p> <p>TII's ITS Strategy looks to define the requirements for both tactical and strategic VMS signs to be located on the network. This will align to the Level of Service provision defined within the ITS Strategy.</p> <p><b>Status:</b> Complete, operational and being developed</p>
<p><b>VMS Message Policy</b></p>	<p><b>Partners:</b> TII and Road Operators</p> <p>In 2019 TII established and continues to coordinate a "VMS Message Policy User Group" with internal stakeholders and road operators.</p> <p>This aims to develop a comprehensive message sign policy for National Roads in order to provide harmonised and consistent messaging across the national VMS network.</p> <p>The main influencers of the policy are operational experience, reference from other EU countries, the EasyWay guidelines and the Traffic Signs Manual.</p> <p><b>Status:</b> The VMS Policy is finalised and expected to be published in September 2023</p>
<p><b>M17/ M18 weather information VMS project</b></p>	<p><b>Partners:</b> TII</p> <p>Following the opening of the M18, TII has monitored weather events affecting the road, in particular hail events that impact on road safety. Further to these observations TII has enhanced the density of the previously built VMS structures with "Strategic VMS", plus some supplementary "Tactical VMS" on the M6 (the intersecting motorway) to allow for advanced notification of weather events to road users. This project is being developed in accordance with the TII ITS Strategy and Implementation Plan.</p> <p><b>Status:</b> Ongoing</p>

<p><b>Dynamic Warning and Speed Activated Speed Signs</b></p>	<p><b>Partners:</b> DoT, 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 (DWS) (including School Warning Signs) and Speed Activated signs.</p> <p>These signs monitor vehicular speed and display a message to the driver of the vehicle indicating their speed or compliance with speed limits. 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>Since 2019, TII is developing Standardisation Specifications for future designs of DWS that will be part of the DWS deployment process binding TII and Local authorities. The development of these “standardisation specifications” aim at: providing a consistency of design; facilitating faster deployments and providing cost certainty, while at the same time enhancing maintenance efficiency with the standardisation of parts.</p> <p><b>Status:</b> Complete, operational and being developed</p>
<p><b>Upgrade internal CCTV on Luas light rail</b></p>	<p><b>Partners:</b> TII</p> <p>To improve security and incident management of the light rail fleet, the internal CCTV was upgraded and now enables real-time remote viewing of CCTV images from the internal cameras.</p> <p>The original project successfully upgraded the onboard CCTV system on the Red Line fleet. The Green line fleet has now been upgraded to a similar digital CCTV system as part of the Vehicle Extension Contract. Additionally, new trams purchased since 2018 have come with the modern CCTV system installed.</p> <p><b>Status:</b> Complete, Operational, and being developed</p>
<p><b>ASB reporting App</b></p>	<p><b>Partners:</b> TII/Transdev/Transit 9</p> <p>The Anti-Social Behaviour (ASB) reporting app is a cloud-based software solution that enables the efficient reporting and escalation of Anti-Social Behavior incidents on the Luas system. The software solution allows various capture points for members of the public such as WhatsApp, SMS or web form with QR codes enabling various engagement and reducing reaction time to antisocial behaviour events.”</p> <p><b>Status:</b> Complete and operational</p>
<p><b>Upgrade of Luas stop CCTV</b></p>	<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.</p> <p>LCC CCTV cameras (Bosch Silverlight) were successfully installed (during the period of 2017-2019) and are offering superior</p>

	<p>performance to the older analogue models.</p> <p>Analog cameras will be replaced by digital versions as part of asset renewals, although at present the analogue devices are operating well.</p> <p><b>Status:</b> Complete, operational, and being developed</p>
<b>Red light camera project</b>	<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 began issuing Fixed Charge Penalty Notices via the Garda computer system for accepted detections.</p> <p>This original pilot scheme ran for a period at the LUAS tram line in Dublin 1 but has not been functioning since 2018. A wider scheme, to include 10 junctions, is being developed cooperatively by TII and NTA. Legal changes to support this system, as well as Garda support for the operational of the system, have been progressed.</p> <p><b>Status:</b> Complete, operational, and being developed</p>
<b>Red traffic signal monitoring equipment</b>	<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, battery driven, and does not need 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>The system worked well and has been in operation by the TII Safety department since 2017. A GDPR assessment was carried out on the system in 2018 and a methodology for works compliant with GDPR was developed.</p> <p><b>Status:</b> Completed. Operational</p>
<b>M50</b>	<p><b>Partners:</b> TII</p> <p>The deployment of ITS equipment on the M50 to implement Variable Speed Limits and lane control signalling along with a new system to control the equipment aims to reduce the number of incidents, better inform road users about ongoing incidents, and improve safety for those attending incidents.</p> <p>Since 2020 approximately 80% of the signage (larger VMS and</p>

	<p>smaller above lane control signals) has been installed. The national legislation to enable the enhanced management of the road network is now in place.</p> <p>Status: ongoing</p>
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**Dún Laoghaire-Rathdown County Council (DLRCC)**

DLRCC has 67 Speed Alert Signs (which inform road users of their actual speed using a colour digital display). The signs are normally located in residential areas where there is a concern with excessive speed. The data is used to quantify the speeds and the data is used to determine if the concerns are real or perceived. The signs are solar powered and can therefore be moved without the cost of providing a cabled power supply.

**Limerick City and County Council (LC&CC)**

LC&CC utilise a range of ITS solutions to improve road safety across the metropolitan road network. These include variable message signs which convey road safety messages. It is estimated that approximately 50% of messages displayed on LC&CC VMS relate directly to road safety. The deployment of driver feedback signage (DFS) is primarily a road safety initiative. DFS has been demonstrated to reduce the average speed of vehicles along the road sections where it has been deployed.

The CCTV system was staffed by Limerick City & County Council and was used for management of the traffic on the road network and bus stop and bus lane monitoring. Approximately 50% of the loading bays in the central business district was covered by CCTV, however this data cannot now be accessed until legislation is introduced which will allow such usage. An Garda Síochána had access to the CCTV system when it was operational. The VMS, DFS and CCTV projects, including spending undertaken by LC&CC have been described in section 2.1 above.

**2.3.2 Progress since 2020**

Description of the progress in the area since 2020:

**Transport Infrastructure Ireland (TII)**

As described in section 2.3.1 above.

**Dún Laoghaire-Rathdown County Council (DLRCC)**

DLRCC’s traffic signals maintenance contractor provides two additional Speed Alert Signs per year. Since 2017, the Council has started using sockets for the signs, so they can be installed at a particular location, moved to another location, and reinstalled at the original location at little cost.

**Limerick City and County Council (LC&CC)**

As described in section 2.3.1 above.

**2.3.3 112 eCall (priority action d)**

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:

As requested in Article 1 of the Decision No 585/2014/EC Ireland has deployed an eCall infrastructure on its territory.

To assess the conformity of the eCall implementation in Ireland the national competent authority, the Department of the Environment, Climate & Communications asked the accredited test laboratory NavCert, Braunschweig, Germany (Accreditation No. D-PI-17052-01-00) to assist as a technical service in undertaking the conformity assessment of Ireland's PSAP according to Delegated Regulation (EU) No. 305/2013.

The Department of the Environment, Climate & Communications confirms that the conformity assessment of Ireland's eCall infrastructure was executed successfully by an accredited laboratory and that the eCall infrastructure conforms to the specification laid down in Delegated Regulation (EU) No 305/2013.

#### **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:

No developments in this area have been made.

Percentage of parking places registered in the information service:

0%

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

0%

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? If not, is there any intention to do it in the future?)

Ireland has not designated any areas on the trans-European road network which require safe and secure parking for trucks and commercial vehicles, as in accordance with the Regulation no traffic and security conditions warranting such designation currently exist in Ireland. Therefore, information services on safe and secure parking for trucks and commercial vehicles will not be implemented at this time. As a result of this, no priority zones are defined.

If there is a requirement for the provisions of Article 3 to be implemented at a later date in relation to truck and commercial vehicle parking, Ireland will already have developed a National Access Point and designated a Competence Assessment Body for Commission Delegated Regulation 886/2013 on road safety related traffic information. These same bodies will be used to fulfil the requirements of Regulation 885/2013.

## 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: in particular, provide information on the C-ITS deployment initiatives and their technical specifications.

#### Transport Infrastructure Ireland (TII)

Project/Activities	Description
<p><b>Auto-routing of Light Rail</b></p>	<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 also included auto-routing at a number of key locations along the route.</p> <p>This project was completed successful and remains in use without issue.</p> <p><b>Status:</b> Complete and operational</p>
<p><b>C-ITS C-Roads Ireland Pilot</b></p>	<p><b>Partners:</b> TII, EU C-Roads Platform, DoT, Dublin City Council (DCC), Road Safety Authority (RSA), Enterprise Ireland (EI), Industrial Development Authority (IDA), Mobile Network Operators, Car Manufacturers and Road Operators</p> <p>The C-Roads Ireland C-ITS pilot is underway. The Action is funded via the CEF by CINEA with the Department of Transport as the beneficiary and Transport Infrastructure Ireland as the Implementing Body.</p> <p>The overall aim of the C-Roads Ireland C-ITS pilot is to deploy, trial and evaluate Day-1 and future C-ITS services. The pilot will include development of services to align with Irish priorities, whilst recognising relevant standards and regulation. The pilot will test and evaluate C-ITS services on the Irish Roads Network (5 sections), predominantly on the Irish TEN-T network and a strategic route approaching (motorways: M1, M50, M7, M8, M18) and within Dublin City. The pilot will consider how the wider Cooperative, Connected and Automated Mobility (CCAM) model supports C-ITS and wider CCAM considerations.</p> <p>The objectives of the Irish C-Roads national pilot are as follows:</p> <ul style="list-style-type: none"> <li>• Deploy a national C-ITS pilot and understand the issues associated with developing, delivering and operating C-ITS services,</li> </ul>

- Understand how C-ITS infrastructure and service provision may be scaled to include all Day 1 and Day 1+ services,
- Test, validate and evaluate the impact of the piloted C-ITS services to understand how this may affect the network and operations and when scaled to higher levels of penetration,
- Evaluate the impact of C-ITS from a technological, safety, efficiency and compliance perspective and using established guidance from the C-Roads Working Groups, wider European guidance and agreed national approaches,
- Develop an understanding of the opportunities and limitations of system interoperability, and network operations considering the policy, regulations and standards requirements for C-ITS
- To enable Ireland's road operators and industry partners to improve their knowledge of future disruptive technologies, and provide a meaningful contribution to the EU knowledge management group/s
- To support and drive industry involvement which will accelerate C-ITS service development and deployment and support the development of a hybrid network which is fit for the future, and
- Deliver test & evaluation data and information that can be used to develop a business case for permanent and wider deployment and inform the operating model for C-ITS Services. This data would be considered with the evaluation of data from other C-Roads trials.

Having an approved procurement strategy enabled work to commence on the preparation of a C-ITS specification, where the scope of works included the site design, supply, installation, testing and commissioning of ITS-G5 roadside units (RSUs) on the M50 and M1 motorways.

A C-ITS service specification has been prepared that defines both physical and system related infrastructure dependencies (to inform the C-ITS equipment specification outlined above and the central station specification outlined below). The service specification defined the operational requirements of each service, e.g. transmission, triggers and data requirements - the output from this analysis has informed the development an operational plan.

In parallel with the above, work has been undertaken to define minimum functional requirements for the C-ITS central station (C-ITS-S). These requirements have captured a broader specification

	<p>for a new traffic management system that Transport Infrastructure Ireland are committed to procure.</p> <p>Since 2020, equipment has been procured and tested (ongoing). The installation of C-ITS Road Side Units is underway and the various communications links between the C-ITS Central Station, Road Side Units, and On Board Units has been demonstrated. The C-Roads Harmonised C-ITS Specifications (2.0) are being used.</p> <p>Initially due to finish by December 2023, an extension has been granted till the end date to December 2024. The deployment of Road Side Units is progressing and is expected to be complete by September 2023.</p> <p><b>Status:</b> Started May 2019 and ongoing</p>
<p><b>Deployment of ITS Equipment on the M7/N7 on the approach to M50 to facilitate incident detection.</b></p>	<p><b>Partners:</b> TII</p> <p>This project is part of the MERIDIAN EU CEF funded project and will run between 2022 and 2025. The main aim is to deploy an ITS scheme on M7/N7, radial route to M50 (Dublin), that will improve road safety and traffic management on this section of road.</p> <p>The project will entail the deployment of new ITS equipment that will provide crucial information to road users and enable TII to efficiently operate the key national primary road and motorway sections of the national primary road network between junction 1 on the N7 and junction 11 on the M7. The Scheme is 32km in total (12km Motorway, 20km National Road).</p> <p><b>Aims and Objectives:</b></p> <ul style="list-style-type: none"> <li>• Enhanced safety through more effective traffic management for road users and construction and maintenance personnel;</li> <li>• Supporting sustainable growth in the national economy by improving the efficiency of the major traffic route into and out of Dublin from the south of the country;</li> <li>• Improved air quality by empowering road users and operators with information to make informed, evidence-based decisions, thereby reducing congestion and emissions</li> <li>• Resilience and optimisation of operations through: <ul style="list-style-type: none"> <li>• Faster incident detection;</li> <li>• Better information on which to base interventions;</li> <li>• Raising the level of underlying roadside technology and functionality to support enhanced control strategies;</li> <li>• Faster recovery of the network.</li> <li>• Supporting the C-ITS Ireland Pilot and advances in connected and autonomous vehicle (CAV) technology.</li> </ul> </li> </ul> <p><b>Status:</b> ongoing</p>

<p><b>Deployment of C-ITS Equipment at approaches to Jack Lynch Tunnel (N40/M8/N25/N8).</b></p>	<p><b>Partners:</b> TII</p> <p>Transport Infrastructure Ireland (TII) is currently embarking on an extensive C-ITS deployment in Cork city, co-funded by the EU through the Meridian programme. The main philosophy of the C-ITS is to allow for traditional ITS roadside infrastructure and incident detection systems and on-board vehicular systems to work together cooperatively through ITS-G5 (IEEE-802.11p) communication to provide a range of C-ITS services and use cases to the road user. Thereafter, it is intended to build on the deployment to develop a roadmap to include all Day 1 and Day 1+ services.</p> <p><b>The C-ITS services envisaged for this deployment are:</b></p> <ul style="list-style-type: none"> <li>• In-Vehicle Signage</li> <li>• Hazardous Location Notification</li> <li>• Road Works Warning</li> <li>• Probe Vehicle Data</li> </ul> <p>The aims of the C-ITS network are to improve mobility (reduce congestion), improve road safety, improve incident management through information dissemination to public and key transport role players for better decision making and transport management, as well as reducing vehicle emission.</p> <p>This current deployment will present an opportunity to evaluate effectiveness of C-ITS technologies with a view for possible further deployment to improve traffic management and efficiency through real time information dissemination and vehicle data collection.</p> <p>Status: Ongoing</p>
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**Cork City Council (CCC)**

CCC are consultative stakeholders for TII in localised pilot C-ITS projects.

**2.4.2 Progress since 2020**

Description of the progress in the area since 2020:

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:

#### Transport Infrastructure Ireland (TII)

Project/Activities	Description
<p><b>Communications Infrastructure for ITS</b></p>	<p><b>Partners:</b> TII</p> <p>TII are engaged in the development of their ITS Communications Infrastructure under a number of headings:</p> <ul style="list-style-type: none"> <li>• Infrastructure Improvement– TII is engaged in a programme of upgrade of telecommunications ducting in the road verge to bring them up to a standard that is appropriate for the installation of fibre optic cable. This involves infilling of gaps of the ducting on the network and testing and repair of existing ducting.</li> <li>• Fibre Optic Roll Out – TII continues to roll out fibre optic cable for dense ITS deployments, such as the N40 Project, and developing their current fibre deployment, such as the M50 and M1. TII, as part of their 5 year ITS Implementation Plan, are also planning the deployment of fibre optic cable on the Major Inter Urban routes for both ITS and C-ITS deployments.</li> <li>• Wireless Deployments – Where appropriate TII are continuing to roll out wireless and cellular technology to reach last mile and remote devices, such as CCTV, Traffic Monitoring Units, ANPR, VMS, etc</li> </ul> <p><b>Status:</b> ongoing</p>
<p><b>Electric Vehicle Infrastructure</b></p>	<p><b>Partners:</b> Various</p> <p>In developing a national network of public charging points, ESB owns, operates and maintains a growing network of 1,500 public charge points across the island of Ireland. Some are AC (22kW), some are DC (up to 50kW) and some are high power (150kW).</p> <p>ESB is currently undertaking a €20 million programme to expand and enhance the charging network across Ireland which is part funded by the Irish Government’s Climate Action Fund, to help meet the expected growth of electric vehicles in the coming years.</p>

	<p>Additionally, fifty existing Standard (AC) chargers are being replaced with Fast (DC) chargers.</p> <p>In relation to other partners, it is possible to report the following:</p> <ul style="list-style-type: none"> <li>• The number of Tesla supercharger stations has increased to 9. Tesla also has over 50 destination charging stations across Ireland.</li> <li>• EasyGo has over 1050 chargers in Ireland.</li> </ul> <p><b>Status:</b> Complete, operational and being developed</p>
<p><b>National ITS Architecture</b></p>	<p><b>Partners:</b> DoT, TII, NTA</p> <p>TII is currently developing its overall data strategy and architecture which will incorporate their ITS data. This will define how data/information is retrieved, stored, secured, shared and disseminated, such as through the Open Data Portal. (LINK: <a href="https://data.tii.ie/">https://data.tii.ie/</a>)</p> <p><b>Status:</b> Ongoing</p>
<p><b>Major Inter-Urban ITS projects</b></p>	<p><b>Partners:</b> TII</p> <p>TII are developing their 5 year ITS Strategy and accompanying ITS Implementation Plan. The primary focus of these is on the Major Inter Urban Routes, to tie in with the Dublin and Cork Regional deployments. The strategy aims to deliver varying service levels across the network, based on defined criteria (e.g. Weather Events, AADT, Accidents, etc). These service levels focus on Monitoring, Provision of Information, and Control. To facilitate these service levels requires different device deployments, including:</p> <ul style="list-style-type: none"> <li>• Deployment of road VMS approaching interchanges, incidents of frequent weather events, areas of high AADT.</li> <li>• CCTV at key interchanges and high AADT</li> <li>• ANPR journey time across the MIU network</li> <li>• Supplementing the existing Traffic Monitoring Units</li> <li>• Weather detection devices</li> <li>• Fibre optic and wireless communications</li> </ul> <p><b>Status:</b> ongoing</p>
<p><b>Upgrade and Coordination of Traffic Management Centres</b></p>	<p><b>Partners:</b> DoT, TII, 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</p>

	<p>other authorities across the regions and country.</p> <p>TII's Motorway Operations Control Centre was completed at the end of 2019. The main control room features a 3m-high, 15m-wide, 4.2-million-pixel video wall, which displays real-time feeds from the motorway CCTV camera network. It allows motorway and tunnel operators to spot developing incidents, enlarge views of incidents as they occur, and study CCTV images in detail before making decisions.</p> <p>In 2023, transition from the legacy Traffic Management system to the new Network Intelligence &amp; Management System has continued. This allows for increasing levels of functionality and number of services that will be required presently and in the coming years. Variable speed limits continue to be deployed on a phased basis, currently between Junction 4 to Junction 12 on the M50, and also Junction 3 – 4 southbound., with the use of Cautionary Speed Limits. The primary legislation was passed in June 2023 for the display of regulatory speed limits and Red X Lane control.</p> <p><b>Status:</b> Ongoing</p>
<p><b>Disability Toll Exemption Scheme (DTES)</b></p>	<p><b>Partners:</b> TII, Disability Driver Association of Ireland, Irish Wheelchair Association</p> <p>The Disability Toll Exemption Scheme (DTES) is a centralised national scheme in Ireland, enabling efficient management of toll exemption for modified vehicles under the tax exemption, (for people with disabilities). It started in 2018 and following significant stakeholder engagement over a period of 18 months, the scheme launched in February 2020, rectifying a longstanding issue for toll users and toll chargers.</p> <p>With this project, TII introduced a national card operator who manages toll exemption cards for drivers that owns a modified vehicles under the tax exemption scheme. This project required the management of multiple stakeholders including: all the national toll road operators, Disability Driver Association of Ireland, Irish Wheelchair Association, TII, the Interoperability Management Service Provider (IMSP) and TII's legal representatives.</p> <p><b>Link:</b> <a href="https://dtes.ie/">https://dtes.ie/</a></p> <p><b>Status:</b> Completed and ongoing</p>
<p><b>Low Emission Vehicle Toll Incentive (LEVTI) scheme</b></p>	<p><b>Partners:</b> TII, toll road operators and service providers, DoT, SEAI</p> <p>The LEVTI scheme was launched in July 2018, to incentivise the use of Electric Vehicles. The scheme provides toll discounts/rebates for battery electric, and plug-in hybrid vehicles. The Scheme refunds vary depending on the toll collection location, the toll transaction time and day, the eligible vehicle type (e.g. BEV, PHEV, FCEV) and class (i.e. private, light goods vehicle, SPSV and HDV).</p>

	<p>This project required the management of multiple stakeholders including: all the national toll road operators, all national toll service providers (i.e. toll tag providers), DoT, SEAI, TII, the Interoperability Management Service Provider (IMSP) and TII's legal representatives.</p> <p>It is a project funded by DoT and every year DoT secured funding to support this EV scheme. The tolling Scheme is administrated by Transport Infrastructure Ireland (TII) on behalf of DoT.</p> <p><b>Link:</b> <a href="https://etoll.ie/low-emissions-vehicle-toll-incentive/">https://etoll.ie/low-emissions-vehicle-toll-incentive/</a></p> <p><b>Status:</b> Completed and ongoing</p>
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### **Cork City Council (CCC)**

CCC's ITS Mobility Dashboard is a project developed internally by Cork City Council as a pilot in collaboration with the National Transport Authority (NTA). The purpose of this dashboard is to track the transport mobility of Cork City centre, promote sustainable and active travel, reduce car dependency, and improve public transport connectivity.

The equipment used for cycle detection includes FLIR (a thermal camera that uses AI to detect vehicles but is currently set to detect cycles) and Smart Micro. The data sources for the dashboard include the API from Springboard for pedestrians and data collectors from Infratech for cycles. The server for the dashboard is an isolated, fibre-connected server.

The dashboard's visualization and dashboard itself are based on Microsoft Power BI. This software allows for real-time and interactive analysis of data from different sources. It is intuitive and user-friendly, making it easier for the Cork City Council to understand and interpret the data collected.

### **Limerick City and County Council (LC&CC)**

A "car-to-go" car sharing scheme is currently operating by private contract.

LC&CC run a 'Limerick Life-Saver' project which has benefited 55,000 children in Limerick County. This 2-day programme, which is aimed at Transition Year students, includes simulating road accidents in order to inform young people to the dangers associated with road transport. This project was suspended during 2020 to 2022 due to COVID-19, it is hoped it will recommence in 2023.

LC&CC utilise ITS solutions at all major road works in the metropolitan area. Mobile VMS are deployed in order to disseminate information and manage traffic. The LC&CC website is also utilised to inform the public of all upcoming works and potential restrictions.

LC&CC monitor on-street e-vehicle charging spaces. Twelve new e-vehicle charge stations were engaged in since 2018. Parking sensors have been added to determine occupancy and stay time.

## **2.5.2 Progress since 2020**

Description of the progress in the area since 2020:

As described in 2.5.1

### 3 Key Performance Indicators (KPIs)

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

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

#### 3.1 Deployment KPIs

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

<b>National Roads (responsibility of TII)</b>	
<b>Main North Sea-Mediterranean Corridor (M1/M50/M7/M8)</b> (This forms part of the Core TEN-T Network)	347
<b>Core TEN-T Network</b>	499
<b>Comprehensive TEN-T Network</b>	1701
<b>Motorways (Not Part of TEN-T)</b>	65
<b>Other Sections</b>	3032
<b>Total</b>	5297

Note: There may be some minor changes to the above figures from the revision of the TEN-T Regulations (due in 2024).



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



Figure 3-2: Ireland Core Network



Figure 3-3: Ireland Comprehensive Network

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

Figures to be provided by type of network / zone.

Figures to distinguish fixed and mobile equipment.

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

- Length of road network type / road sections (in km) equipped with information gathering infrastructures & Total length of this same road network type (in km):
- KPI = (kilometres of road network type equipped with information gathering infrastructures / total kilometres of same road network type) x 100

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). Figures to distinguish fixed and mobile equipment. - <b>not distinguished in Ireland</b>	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	Information Gathering Infrastructures	
Main Corridor	347/347	100
Core TEN-T	499/499	100
Comprehensive TEN-T	1701/1701	100
Motorways	65/65	100
Other Sections	3032/3032	100
Respondents outside of National Roads		
Cork City Council	6/67	8.9%
Dún Laoghaire-Rathdown County Council	85/135	63%
South Dublin County Council	80/950	8.4%
Limerick City and County Council	33.4/93.8	35.6%

#### Kildare County Council

No data is collected. 87 junctions are monitored but no route km is monitored.

### 3.1.2 Incident detection (road KPI)

Figures to be provided by type of network / zone.

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

- Length of road network type / road sections (in km) equipped with ITS to detect incident & Total length of this same road network type (in km):
- KPI = (kilometres of road network type equipped with ITS to detect incident / total kilometres of same road network type) x 100

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. - <b>not distinguished in Ireland</b></i>	Length of road network type/road sections (in km) equipped with ITS to detect Incident  Total length of this same road network type (in km)	$\text{KPI} = \left( \frac{\text{kilometres of road network type equipped with ITS to detect Incident}}{\text{total kilometres of same road network type}} \right) \times 100$
<b>Network/Part of Network</b>		
<b>Incident Detection</b>		
<b>National Roads</b>		
Main Corridor	204/347	59
Core TEN-T	204/499	41
Comprehensive TEN-T	60/1701	4
Motorways	50/65	77
Other Sections	0/3032	0
<b>Respondents outside of National Roads</b>		
Dún Laoghaire-Rathdown County Council	60/135	44%
South Dublin County Council	55/950	5.7%
Kildare County Council	25/240	10.42%
Limerick City and County Council	33.4/93.8	35.6%

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

Figures to be provided by type of network / zone.

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

- Length of road network type / road sections (in km) covered by traffic management and traffic control measures & Total length of this same road network type (in km):
- KPI = (kilometres of road network type covered by traffic management and traffic control measures / total kilometres of same road network type) x 100

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 ITS to detect Incident  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
Network/Part of Network	Incident Detection	
National Roads		
Main Corridor	37/347	10
Core TEN-T	5/499	1
Comprehensive TEN-T	1.5/1701	0
Motorways	0/65	0
Other Sections	2.5/3032	0
Respondents outside of National Roads		
Dún Laoghaire-Rathdown County Council	60/135	44%
South Dublin County Council	460/950	48%
Limerick City and County Council	34.2/93.8	35.6%

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

Figures to be provided by type of network / zone.

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

- Length of road network type / road sections (in km) covered by C-ITS services or applications & Total length of this same road network type (in km):
- KPI = (kilometres of road network type covered by C-ITS services or applications / total kilometres of same road network type) x 100

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) covered by Cooperative-ITS services and applications  Total length of this same road network type (in km)	$\text{KPI} = (\text{kilometres of road network type covered by Cooperative-ITS services and applications} / \text{total kilometres of same road network type}) \times 100$
<b>Network/Part of Network</b>		
<b>Incident Detection</b>		
<b>National Roads</b>		
Main Corridor	3/347	1
Core TEN-T	0/499	0
Comprehensive TEN-T	0/1701	0
Motorways	0/65	0
Other Sections	0/3032	0

### 3.1.5 Real-time traffic information (road KPI)

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

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

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

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

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 the provision of real-time traffic information (in km)  Total length of this same road network type (in km)	$KPI = (\text{kilometres of road network type equipped with the provision of real-time traffic information (in km)} / \text{total kilometres of same road network type}) \times 100$
Network/Part of Network	Incident Detection	
National Roads		
Main Corridor	272/347	78
Core TEN-T	372/499	75
Comprehensive TEN-T	243/1701	14
Motorways	50/65	77
Other Sections	0/3032	0
Key Respondents outside of National Roads		
Dún Laoghaire-Rathdown County Council	14.1/135	10.4%
Limerick City and County Council	10.7 km/93.8	11.4%

### 3.1.6 Dynamic travel information (multimodal KPI)

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

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

- Length of transport network type (in km) with provision of dynamic travel information services & Total length of this same transport network type (in km):
- Number of transport nodes (e.g. rail or bus stations) covered by dynamic travel information services & Total number of the same transport nodes:
- $KPI = (\text{kilometres of transport network type with provision of dynamic travel information services} / \text{total kilometres of same transport network type}) \times 100$
- $KPI = (\text{number of transport nodes with provision of dynamic travel information services} / \text{total number of same transport nodes}) \times 100$

Figures to be provided	Road Network	KPI
<p>Figures to be provided by type of network / zone / node.</p> <p>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.</p>	<p>Length of transport network type (in km) with provision of dynamic travel information services (in km) Total length of this same road network type (in km)</p>	<p>KPI = (kilometres of transport network type with provision of dynamic travel information services / total kilometres of same transport network type) x 100</p>
<b>Network/Part of Network</b>		
<b>Real-time Traffic Information (per network km)</b>		
<b>ROAD:</b>		
Dún Laoghaire-Rathdown County Council	3/135	2.2%
<b>RAIL:</b>		
Luas Light Rail Network (excl. Luas Cross City)	42.5/42.5	100
<b>Network/Part of Network</b>		
<b>Real-time Traffic Information (per transport node)</b>		
	<p>Number of transport nodes (e.g. rail or bus stations) covered by dynamic travel information services Total number of the same transport nodes</p>	<p>KPI = (number of transport nodes with provision of dynamic travel information services / total number of same transport nodes) x 100</p>
<b>Network/Part of Network</b>		
<b>Real-time Traffic Information (per transport node)</b>		
<b>ROAD</b>		
Bus stops (primarily in Greater Dublin Area and regional cities (Cork, Limerick, Galway))	776/12865	6.18
<b>RAIL</b>		
Luas Light Rail Network	67/67	100
Iarnród Éireann Rail Stations	147/147	100

## National Multi-Modal Journey Planner (“TFI Live”)

This is the NTA’s door to door public transport journey planning service provided through the internet and mobile services. The National multi-modal Journey Planner has all-island coverage and features information on journeys on buses, trams, trains, walking, taxis, ferries to the islands. The planner includes information on all licensed / contracted surface public transport services operating on the island of Ireland and can give cycle specific journey plans. The app also provides real- time arrival/departure information where available.

Coverage:

- Dublin Commuter Rail System: 100% coverage
- Cork Suburban Rail System: 100% coverage
- National Inter-city Rail System: 100% coverage
- Dublin Light Rail System: 100% coverage
- Cork Metropolitan Area Bus System: 100% coverage
- Limerick Metropolitan Bus System: 100% coverage
- Galway Metropolitan Bus System: 100% coverage

### 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

### Limerick City and County Council (LC&CC)

There are currently no freight-specific ITS services within the network of the Limerick Metropolitan Area. ITS services in freight nodes such as ports and rail stations are in the ownership of third parties, and LC&CC do not hold data relating to these sites.

### 3.1.8 112 eCalls (road KPI)

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

## 3.2 Benefits KPIs

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

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

$KPI = ((\text{travel time before ITS implementation or improvement} - \text{travel time after ITS implementation or improvement}) / \text{travel time before ITS implementation or improvement}) \times 100$

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.

Anecdotally, some Local Authorities have noted that when the SCATS system goes down or a set of signals becomes isolated due to comms problems, the additional delays are excessive. Additionally, Limerick City and County Council estimate from AUTC observation that journey times have decreased by approximately 15% across the Metropolitan Area since the implementation of the AUTC system. However, Covid restrictions and extensive refurbishment works on O'Connell St., Limerick would also have affected journey times.

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

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

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

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

The Road Safety Authority (RSA) captures statistics in relation to all road traffic collisions. This information is available via data.gov.ie and through the RSA homepage (www.rsa.ie). 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. Additionally, several local authorities have noted that the road fatality rates in their regions are so low as to make it impossible to disaggregate and quantify the effect of ITS.

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

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

$KPI = ((\text{traffic CO}_2 \text{ emissions before ITS implementation or improvement} - \text{traffic CO}_2 \text{ emissions after implementation or improvement}) / \text{traffic CO}_2 \text{ emissions before ITS implementation or improvement}) \times 100$

Not collected. However, Limerick City and County Council note that in Limerick, due to the effects of Covid-19 restrictions, CO<sub>2</sub> emissions from the road transport sector are estimated by the EPA to have fallen by 16% in 2020 and 11% in 2022 from 2019 levels. In 2022 CO<sub>2</sub> emissions are estimated to have returned to 2019 levels.

### 3.3 Financial KPIs

*ITS 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)	2020	2021	2022
Transport Infrastructure Ireland – National Roads	€7,004,262	€8,506,809	€6,830,326

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.

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)	2020	2021	2022
Transport Infrastructure Ireland – National Roads			
Total O&M costs	€1,619,912	€2,333,281 €	€2,105,795
O&M Costs for Main/Core/Comprehensive TEN-T Network (2200 km)	€736.32/km	€1,060.58/km	€957.18/km
O&M Costs for total road network (5296 km)	€305.87/km	€440.57/km	€397.62/km

**NTA:**

Annual investment in public transport ITS (as % of total infrastructure investment)	2020	2021	2022
NTA – ITS Spending	€0.2m	€1.0m	€1.1m
NTA – Total Infrastructure Investment	€410.1m	€719.3m	€805.1m
NTA - ITS Spending as % of Total Infrastructure	.05%	.14%	.14%

**Cork City Council (CCC)**

ITS capital investment/Adopted Roads & Transportation Budget for 2023 across the network

Total: €3,350,000/€78,725,000 = 4.2%

ITS operating and maintenance costs: €2,398,600/919.5km = €2,608/km across the network

**Dún Laoghaire-Rathdown County Council (DLRCC)**

Annual Operating and Maintenance costs of road ITS (€/km of network covered)	2023
Dún Laoghaire-Rathdown County Council	
Total O&M costs	870.000 €
O&M Costs for total road network	6444 €/km
Salaries:	€75,000
ITS Spend on traffic management	€350,000

**Kildare County Council (KCC)**

Annual investment in road ITS (as a % of total transport infrastructure investments): The total capital investment is €350,000 per annum. Based on an annual budget of approximately €35,000,000, ITS =0.01%.

Annual operating & maintenance costs of road ITS (in euros per kilometre of network covered): The total operating & maintenance costs is €750,000 per annum and there is a total length of 2,400km, ITS =€312 per km/annum.

**Limerick City and County Council (LC&CC)**

Expenditure Type	Year		
	2020	2021	2022
Total ITS Expenditure	€386,000	€419,000	€435,600
Expenditure per km of national and regional road (111.1km in network)	€3,474	€3,771	€3,921

## 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 analysed 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 optimise 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
ATMS	Advanced Traffic Management System
AUTC	Adaptive Urban Traffic Control
AVLS	Automatic Vehicle Locating System
CAV	Connected and Autonomous Vehicles
CCAM	Cooperative, Connected and Automated Mobility
CCC	Cork City Council
CCTV	Closed Circuit Television
C-ITS	Cooperative Intelligent Transport Systems
CMATS	Cork Metropolitan Area Transport Strategy
CSO	Central Statistics Office
DCC	Dublin City Council
DECC	Department of the Environment, Climate & Communications
DFS	Driver Feedback Signage
DLRCC	Dún Laoghaire-Rathdown County Council
DOT	Department of Transport
DPTIM	Dublin Public Transport Interface Module
DWS	Dynamic Warning Signs
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
GTFS	General Transit Feed Specification
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
MVSL	Mandatory Variable Speed Limits
NAP	National Access Point
NaPTAN	National Public Transport Access Nodes
NeTex	Network Timetable Exchange

NRA	National Roads Authority
NSAI	National Standards Authority of Ireland
NTA	National Transport Authority
OBU	On-board unit
OSI	Ordnance Survey Ireland
P2PE	Point- To- Point Encryption
PCI-DSS	Payment Card Industry Data Security Standard
PMS	Pavement Management System
PSAP	Public Safety Answering Point
RMO	Road Management Office
RMS	Remote Monitoring Systems
RSA	Road Safety Authority
RSU	Road Side Unit
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
TISS	Travel Information Systems and Services
TVM	Ticket Vending Machine
UTC	Urban Traffic Control
UTMC	Urban Traffic Management Control
VMS	Variable Message Sign
V2I	Vehicle-to-infrastructure
V2V	Vehicle-to-vehicle