Intelligent transport systems
Key performance indicators for the EU
Guidance document

NOVEMBER 2024

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Guiding Principles

Purpose

- Create insight on the deployment and impacts of ITS equipment and services in the EU over time.
- Provide high-level policy information.

Gradual approach in mandating KPI reporting over time

- Start in 2025 with deployment and financial KPIs, while keeping benefit KPIs voluntary.
- Expand mandate over time to include benefit KPIs.
- Provision of reference values for benefit KPIs; where relevant develop methodology(ies) for benefit KPIs, after the initial report for which existing methodologies developed e.g. by the NEXT-ITS project or EU-EIP Activity 5 can be used.
- Anticipate related data collection over time.

Gradual approach in coverage of mandated KPIs over time

- Start with TEN-T network (excl. Urban Nodes) and motorways.
- Expand coverage over time to include TEN-T Urban Nodes, primary roads and where relevant Transport Nodes.

Ultimate goal:

- EU-wide coverage for the deployment and financial KPIs (entire road network).
- Robust reference values, based on enough good samples, for the benefit KPIs (which would allow prudent extrapolation, due to the limitations of the calculations of these KPIs, the impact of ITS being sometimes difficult to isolate from the impact of other measures).
- Triennial reporting for all KPIs.

Scope / Geographical coverage

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

Types of roads included in the geographical coverage:

- TEN-T (Comprehensive, Urban nodes)

    - Comprehensive trans-European road network means the road transport infrastructure as defined in Regulation (EU) No 1315/2013.
    - Urban Node means an urban area where elements of the transport infrastructure of the trans-European transport network for passengers and freight, such as ports including passenger terminals, airports, railway stations, bus terminals, multimodal freight terminals, located in and around the urban area, are connected with other elements of that infrastructure and with the infrastructure for regional and local traffic including infrastructure for active modes.
- Motorway (not part of the TEN-T) means a road which is designated as such by the Member State in which it is located.
- Primary road means a road outside urban areas, designated by a Member State, that connects major cities or regions, or both, and that is not classified as part of the comprehensive trans-European road network or as a motorway.
- Entire road network: road network that is publicly accessible to motorised traffic. By way of exception, it shall not apply to private roads, unless they are part of the comprehensive TEN-T network or they are designated as a motorway or as a primary road.

The KPI on eCall covers the territory of each Member State covered by at least one public mobile wireless communications network.

The multimodal dimension and the aspect of transport accessibility for people with reduced mobility, orientation and/or communication will be captured through the coverage of transport network (i.e. any type of public transport, level rail crossing) and nodes (e.g. airport, rail or bus stations, logistic platforms).

ITS deployment KPIs

*[Levels of Services might be indicated in conjunction with ITS deployment KPI. Levels of Services extend from "no service" to "basic", "enhanced", "advanced" as defined in **The Reference Handbook for Harmonised ITS Core Service Deployment in Europe**]*

Short Name	**Information gathering infrastructures / equipment (road KPI)**
Long Name	% of road network type covered by information gathering infrastructures / equipment
Definitions	Information gathering infrastructures / equipment means any road based or mobile ITS enabling traffic monitoring, weather or environmental conditions monitoring, emissions monitoring, or forecasting of traffic conditions. It includes for instance sensors, cameras / CCTV, traffic control centres, floating car data and C-ITS stations. It is acknowledged that technologies can differ from one country / network / area to another. It is acknowledged that such infrastructures / equipment can serve several purposes (from traffic measures to information services).
Figures to be provided	Length of road network type / road sections (in km) equipped with information gathering infrastructures & Total length of this same road network type (in km). Figures to be provided by type of network. ***Note: the figure to be provided is the length of network covered by the service related to the equipment.*** **Figures to be provided by type of services, and where relevant distinguish fixed and mobile equipment (e.g. C-ITS equipped roadworks trailers).**
Calculation	KPI = (kilometres of road network type equipped with information gathering infrastructures / total kilometres of same road network type) x 100 KPI to be calculated by type of network.
Responsible point of contact	ITS Committee (Member States)

Short Name	**Incident detection (road KPI)** **Traffic management and traffic control measures (road KPI)** **Cooperative-ITS services and applications (road KPI)**
Long Name	% of road network type covered by: • incident detection • traffic management and traffic control measures • cooperative-ITS services and applications
Definitions	Incident detection means any ITS used to detect traffic incidents (e.g. accidents, congestion) on a section of road network that can be used to trigger actions to manage the incident. Traffic management and traffic control measures means any measures derived from road based ITS enabling the control of traffic movements. It includes for instance hard shoulder running, ramp metering, dynamic lane management, HGV overtaking ban, variable speed limits, as well as parking management, vehicles / fleet prioritisation. Cooperative-ITS services or applications means services or applications using infrastructure to vehicle or vehicle to infrastructure communication. **Figures to be provided by type of services, and where relevant distinguish between public and private service providers.** It is acknowledged that technologies can differ from one country / network / area to another. Tolling does not fall within the scope of these indicators / calculations.
Figures to be provided	Length of road network type / road sections (in km) equipped with ITS to detect incident & Total length of this same road network type (in km). Length of road network type / road sections (in km) covered by traffic management and traffic control measures & Total length of this same road network type (in km). Length of road network type / road sections (in km) covered by C-ITS services or applications & Total length of this same road network type (in km). Figures to be provided by type of network.
Calculation	• KPI = (kilometres of road network type equipped with ITS to detect incident / total kilometres of same road network type) x 100 • KPI = (kilometres of road network type covered by traffic management and traffic control measures / total kilometres of same road network type) x 100 • KPI = (kilometres of road network type covered by C-ITS services or applications / total kilometres of same road network type) x 100 KPI to be calculated by type of network.

Responsible point of contact	ITS Committee (Member States)

Short Name	**Real-time traffic information (road KPI)** **Dynamic travel information (multimodal KPI)** **Freight information (multimodal if possible or road KPI)**
Long Name	% of road / transport network type covered by: • real-time traffic information services • dynamic travel information services • freight information services
Definitions	Real-time traffic information means information derived from any road and traffic data, or their combination thereof, provided by any road authorities, road operators or service providers to road users through usual communication channels. Real time traffic information relates to current traffic conditions on the road network. Such information includes for instance accident locations, incident warnings (incl. safety related events / conditions), road works, congestion hotspots, travel times / delays. Such services fall within the scope of Delegated Regulation (EU) No 886/2013 and Delegated Regulation (EU) 2022/670. Dynamic travel information means up to date information derived from any travel data provided by any transport operators or service providers through usual communication channels. Such services fall within the scope of Delegated Regulation (EU) 2017/1926 amended by Delegated Regulation (EU) 2024/490. Dynamic travel information relates to pre-trip and on-trip information to any travellers. Such information includes for instance disruptions, travel times / delays, vehicles positioning, accessibility of nodes and vehicles. Any information that is to be made available to users should be provided in such a form so that it can be received in full also by users might have specific requirements related to the data, for example people with reduced mobility, orientation and/or communication. Freight information means static and dynamic information tailored to the needs of the freight industry. Such information includes for instance parking / loading availability and cost, access restrictions, incident warnings and disruptions, travel times / delays, vehicles positioning. It is acknowledged that communication channels to provide above-listed services can differ from one country / network / area / operator to another (e.g. VMS, digital / spoken radio, on-board devices, web sites, apps). The above services have to be understood as at least the provision of public services (although implementing bodies of such public services might be private contractors operating under public-private contractual agreements).
Figures to be provided	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). 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. 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. Figures to be provided by type of network / node.
Calculation	• KPI = (kilometres of road network type with provision of real-time traffic information services / total kilometres of same road network type) x 100 • KPI = (kilometres of transport network type with provision of dynamic travel information services / total kilometres of same transport network type) x 100 • KPI = (number of transport nodes with provision of dynamic travel information services / total number of same transport nodes) x 100 • 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 KPI to be calculated by type of network / node (when relevant), and if relevant indicate the proportion of services accessible to passengers with reduced mobility, orientation and/or communication.
Responsible point of contact	ITS Committee (Member States)

Short Name	**112 eCalls (road KPI)**
Long Name	Annual number of automatic and manual 112 eCalls received, including number of false 112 eCalls.
Definitions	Automatic and manual 112 eCalls as defined by EU Legislation. False calls as defined in COCOM questionnaire on 112: False calls are calls which are not followed up with intervention or assistance from the PSAP or the emergency services. Calls that report an emergency event which has already triggered intervention or assistance from the part of the PSAP, therefore not triggering separate intervention or assistance, will not be considered false calls.
Figures to be provided	Total number of automatic 112 eCalls. Number of false automatic 112 eCalls. Total number of manual 112 eCalls. Number of false manual 112 eCalls. Figures to be provided at national level.
Calculation	N/A
Responsible point of contact	Annual COCOM questionnaire on 112 KPIs

ITS benefits KPIs

[the concept of route with and without / before and after ITS is a bit vague. we need representative / integrated results => this might call for monitoring along long stretches of roads or across homogenous sections of roads, followed by further aggregation / average at network level. methods of calculation are left at the discretion of Member States

To assess benefits it might be relevant to develop estimates based on reference values / typical gains (as recommended from research or deployment projects e.g. EIP) applied to deployments observed in the previous section]

Short Name	**Change in travel time (road KPI)**
Long Name	% change in peak period travel time along routes / within areas where ITS has been implemented or improved.
Definitions	Peak period means the hour with the highest traffic flow during a week day. It is defined for each route / area individually. An aggregated average can be calculated for estimation of consolidated results at road network level. Routes / areas where ITS has been implemented or improved should be specified. Length along / area within which the change in travel time is measured should be long / wide enough to be representative.
Calculation	KPI = ((travel time before ITS implementation or improvement – travel time after ITS implementation or improvement) / travel time before ITS implementation or improvement) x 100 Figures to be provided also include vehicle.km for the route / area considered
Responsible point of contact	ITS Committee (Member States)

Short Name	**Change in traffic-CO2 emissions (road KPI)**
	(road KPI)
Long Name	% change in number of reported road crashes resulting in death or injuries along routes / within areas where ITS has been implemented or improved
Definitions	Reported road crashs mean the number of crashes resulting in death or injuries on a route / within an area. If possible, crashes can distinguish fatalities, serious and slight injuries following the latest definitions used as part of the CADAS glossary[1] which also provides guidance in the calculation of these statistics. An aggregated average can be calculated for estimation of consolidated results at national level (i.e. aggregation of several routes / areas). Routes / areas where ITS has been implemented or improved should be specified.
Figures to be provided	Number of road crashes resulting in death or injuries before ITS implementation or improvement Number of road crashes resulting in death or injuries after ITS implementation or improvement Results can be provided / aggregated at national level to be representative enough. If possible, distinction can be made between crashes resulting in deaths, serious injuries or slight injuries.
Calculation	KPI = ((number of road crashes resulting in death or injuries before ITS implementation or improvement – number of road crashes resulting in death or injuries after ITS implementation or improvement) / number of road crashes resulting in death or injuries before ITS implementation or improvement) x 100 Figures to be provided also include vehicle.km for the route / area considered.
Responsible point of contact	ITS Committee (Member States)

[1] https://road-safety.transport.ec.europa.eu/document/download/7f8e38c2-87cf-4426-afc4-277ae4c24591_en?filename=CADaS%20Glossary_v%203_8_1.pdf

Long Name	% change in annual traffic CO2 emissions on routes / within areas where ITS has been implemented or improved
Definitions	Traffic CO2 emission means the amount of CO2 emitted collectively by road vehicles utilising a route / circulating within an area. This should be aggregated up to produce an annual figure. CO2 emissions are typically estimated based upon traffic flows and speeds coupled with assumptions regarding fuel consumption and/or average vehicle efficiency per kilometre for the different vehicle types using a route / circulating within an area. 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.
Calculation	KPI = ((traffic CO2 emissions[2] before ITS implementation or improvement – traffic CO2 emissions after implementation or improvement) / traffic CO2 emissions before ITS implementation or improvement) x 100
Responsible point of contact	ITS Committee (Member States)

[2] Measured in metric tons CO2 equivalent

ITS financial KPIs

[Investment can be estimated roughly (e.g. a % can be extrapolated from a selection of projects incl. TEN-T/CEF projects). Operating & maintenance costs shall be known by NRAs / road operators (e.g. RWS annual report)].

Annual public investment in road ITS (as a % of total transport infrastructure investments) + *figures for private investments when possible*

Annual public operating & maintenance costs of road ITS (in euros per kilometre of network covered) + *figures for private costs when possible*

ITS includes any types of systems and services altogether.

Member States should be able to estimate these investments with possible inputs from their implementing bodies.