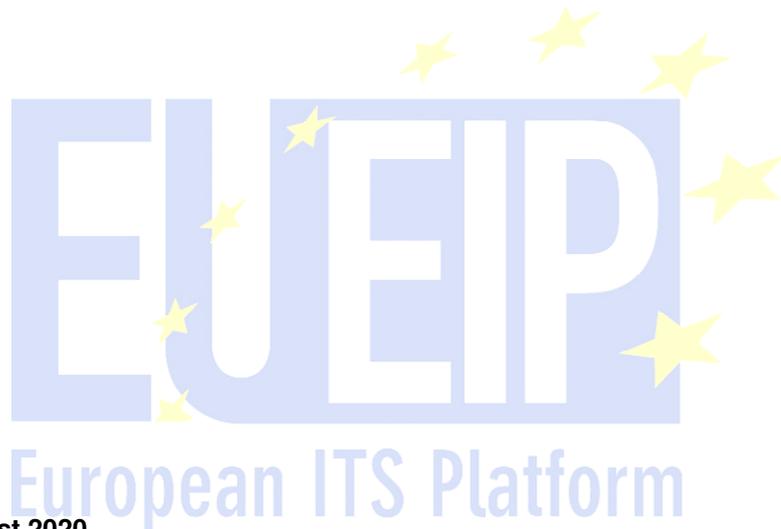


# EU EIP Activity 5: Evaluation

Interim Report 1: 2019

Final



Version: 1.0

Date: 19<sup>th</sup> August 2020

## Document Information

### Authors

Name	Organisation

### Distribution

Date	Version	Dissemination
4th Feb 2020	0.1	EU EIP A5 group
2nd June 2020	0.8	EU EIP A5 group
5th June 2020	0.9	WP1 / Henk Taale
19th August 2020	1.0	Public

European ITS Platform

---

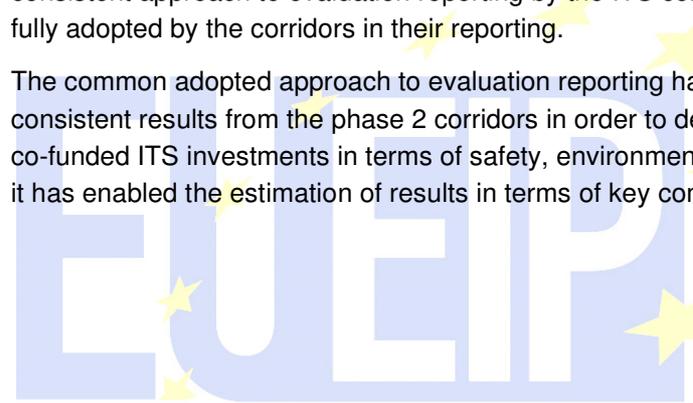
## Preface

Since the launch of the European ITS Platform (EU EIP) in 2016, the EU EIP Evaluation Group (Activity 5) has been collectively responsible for coordinating and overseeing the delivery of evaluation related EU EIP Milestones and supporting internal deliverables. The EU EIP Evaluation Group has also been responsible for developing and promoting a suite of tools to support the ITS Corridors in their Evaluation Reporting and for bringing together the reported impacts, benefits and results from the ITS Corridors in a consistent and harmonised way.

This report provides an overview of the main outputs of the EU EIP Evaluation group as well as summarising the key results gathered from the co-funded ITS Corridors to date.

As reported below, the EU EIP Activity 5 Evaluation Expert Group has fully achieved the majority of planned Milestones and, in so doing, has developed a framework to nurture a consistent approach to evaluation reporting by the ITS corridors which, in turn, has been fully adopted by the corridors in their reporting.

The common adopted approach to evaluation reporting has consequently yielded consistent results from the phase 2 corridors in order to demonstrate the impact of the co-funded ITS investments in terms of safety, environment and congestion. Furthermore, it has enabled the estimation of results in terms of key common KPIs at a global level.



European ITS Platform

---

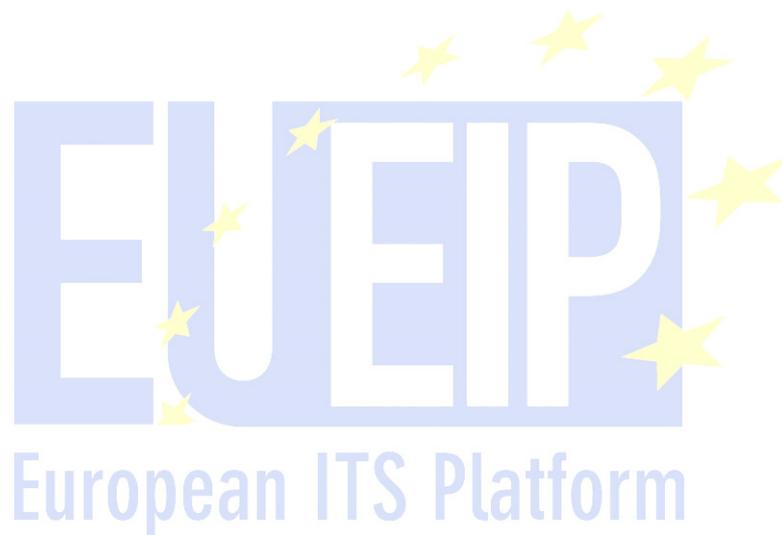
TABLE OF CONTENTS

<b>Document Information</b>	<b>2</b>
<b>Preface</b>	<b>3</b>
<b>1. Scope and Composition of EU EIP Activity 5: Evaluation</b>	<b>7</b>
1.1. Overview of Scope	7
1.2. EU EIP Evaluation Group Structure	8
<b>2. Work Structure of EU EIP Evaluation Group (A5)</b>	<b>10</b>
2.1. EU EIP Evaluation Milestones	12
2.2. Work Plan	12
2.2.1. ITS DIRECTIVE PRIORITY ACTIONS (WORK PACKAGE 1)	14
2.2.2. DEFINITION OF KPI (WORK PACKAGE 2)	14
2.2.3. GUIDANCE AND TEMPLATES (WORK PACKAGE 3)	14
2.2.4. ITS DECISION MAKING TOOLKIT (WORK PACKAGE 4)	15
2.2.5. PROGRESS MONITORING	15
2.2.6. INTERIM AND FINAL EVALUATION REPORT (WORK PACKAGE 5)	16
<b>3. Report on EU EIP A5 achievements to date</b>	<b>17</b>
3.1. ITS Directive Reporting	17
3.2. KPI Definitions	18
3.3. Guidance and Reference	20

3.3.1. WEBSITE	20
3.3.2. EVALUATION LIBRARY	20
3.3.3. EU EIP EVALUATION REPORT TEMPLATE	20
<b>3.4. ITS Toolkit</b>	<b>22</b>
3.4.1. ITS TOOLKIT SPREADSHEET	22
3.4.2. USER INTERFACE	22
<b>3.5. Evaluation Reporting</b>	<b>24</b>
3.5.1. CORRIDOR INTERACTION	24
3.5.2. INTERIM REPORT	24
<b>4. Summary of Corridor Results</b>	<b>25</b>
4.1. Arc Atlantique	25
4.1.1. OVERVIEW OF CORRIDOR	25
4.1.2. SHOWCASE RESULTS	26
4.1.3. IMPACT / ROI	27
4.2. Crocodile	28
4.2.1. OVERVIEW OF CORRIDOR	28
4.2.2. SHOWCASE RESULTS	28
4.2.3. IMPACT / ROI	29
4.3. MedTIS	30
4.3.1. OVERVIEW OF CORRIDOR	30
4.3.2. IMPACT / ROI	32
4.4. Next ITS	33
4.4.1. OVERVIEW OF CORRIDOR	33
4.4.2. SHOWCASE RESULTS	34

---

4.4.3. IMPACT / ROI	34
4.5. Ursa Major	37
4.5.1. OVERVIEW OF CORRIDOR	37
4.5.2. SHOWCASE RESULTS	38
4.5.3. IMPACT / ROI	39
4.6. Conclusions	41
4.6.1. SUMMARY OF KEY GLOBAL RESULTS	41
4.6.2. IMPACT / ROI	41

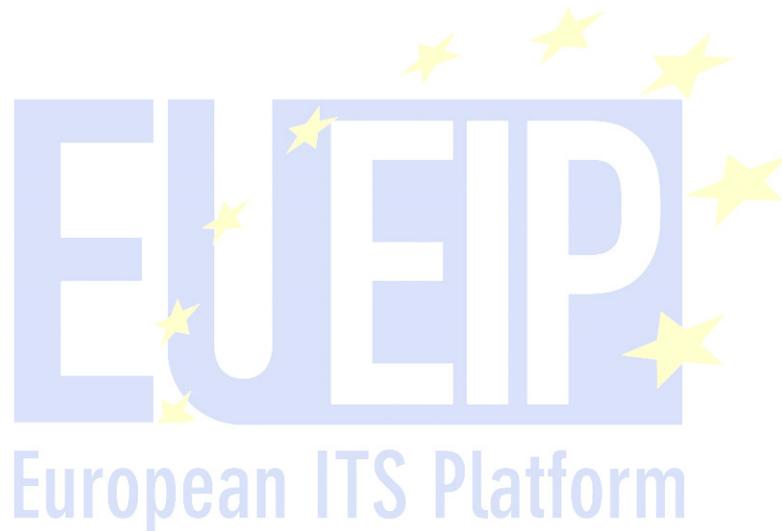


---

## 1. Scope and Composition of EU EIP Activity 5: Evaluation

### 1.1. Overview of Scope

Since the launch of the European ITS Platform (EU EIP) in 2016, the EU EIP Evaluation Group (Activity 5) has been collectively responsible for coordinating and overseeing the delivery of evaluation related EU EIP Milestones and supporting internal deliverables. The EU EIP Evaluation Group has also been responsible for developing and promoting a suite of tools to support the ITS Corridors in their Evaluation Reporting and for bringing together the reported impacts, benefits and results from the ITS Corridors in a consistent and harmonised way.



## 1.2. EU EIP Evaluation Group Structure

The EU EIP Evaluation Group is coordinated and led by the UK (Highways England), who take responsibility for the delivery of the identified milestones outlined in section 2.2 below. The group is co-led by Sweden (Swedish Transport Administration) who are also responsible for the leadership of Work Package 1 which relates more specifically to the assessment of the impacts of the ITS Directive Priority Actions.

The Evaluation Leader is responsible for gathering and reporting consolidated progress updates to the EU EIP Joint Technical Secretariat (JTS), which comprises all EU EIP Activity leads, and the EU EIP Member State Supervision Assembly (MSSA) as required for the duration of the EU EIP eligibility phase (currently to the end of 2020).

The EU EIP Evaluation group comprises different levels of Member State and ITS Corridor representation in varying levels of engagement. Typically members engage in “active”, “participant” or “follower” capacities. Group Members acting in the lead, active and participant capacities directly attend EU EIP Evaluation Group meetings, whilst the attendance of follower members is optional.

It should also be noted that ITS Corridor engagement and input is crucial to the EU EIP Evaluation group’s delivery and, furthermore, that corridor evaluation representatives have, to date, regularly attended and actively contributed to all group deliverables as required. Corridor representatives have played a critical role in cascading the key information from the EU EIP Evaluation Group to the corridor level and, as such, have fully contributed to, and been active in, the development of the EU EIP Evaluation Group deliverables and reporting to date. In so doing, the reach of the A5 group is extended beyond the immediate group membership and directly into the five CEF funded ITS Corridors, which comprise the following Member States:

- Arc Atlantique (Belgium, Spain, France, Ireland, Netherlands, Portugal, UK)
- Crocodile 2 (Austria, Cyprus, Czech Republic, Germany, Greece, Hungary, Italy, Poland, Romania, Slovenia)
- MedTIS 2 (France, Italy, Spain, Portugal)
- NEXT ITS 2 (Denmark, Finland, Germany, Norway, Sweden)
- Ursa Major 2 (Germany, Italy, Netherlands)

To date, the EU EIP Evaluation Group has been very well supported by representatives from all ITS Corridors as well as expertise and participation from the majority of the EU Member States on a regular basis.

The EU EIP Evaluation Group hold regular core group meetings (typically 3-4 times per year). These meetings are supplemented by ad hoc, often Work Package or deliverable-specific teleconferences or web conferences in order to support the development of

---

specific deliverables. Whilst the focus of each meeting varies in accordance with the pertinent issues and prevalent deliverables and milestones of the time, A5 core meetings include updates in relation to each of the defined Work Packages and monitoring of ITS Corridor progress as standard agenda points.

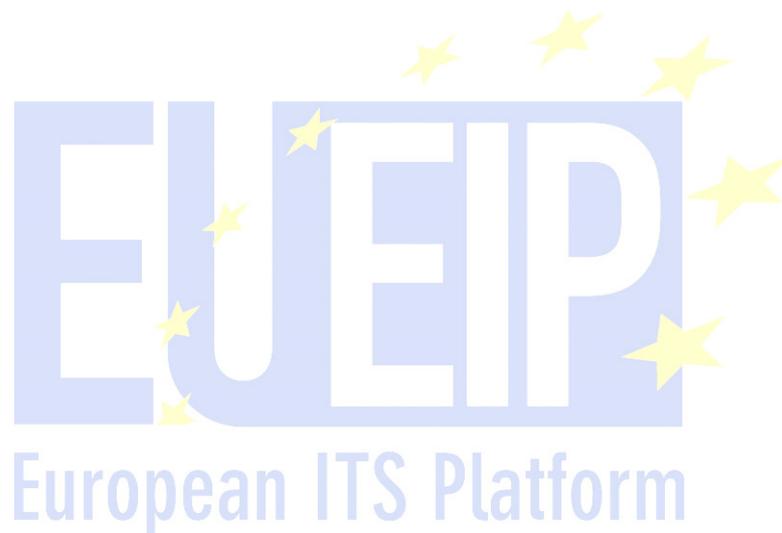


## 2. Work Structure of EU EIP Evaluation Group (A5)

A summary of the key tasks to be undertaken within the Evaluation Activity in the EU EIP programme are:

- Developing and redefining ITS Evaluation KPI, based on work undertaken in EIP+ and aligned to the parallel study by the European Commission. This activity will also be in conjunction with Member States, deployment corridors and other stakeholders.
- Harmonising KPI definitions to enable more consistent reporting and assessments of the impact / benefit of ITS deployment at the European level.
- Monitoring the KPI application and compliance in corridor (and other) ITS projects and periodic reviewing on the basis of feedback received.
- Providing bespoke evaluation guidance and templates to support a harmonised approach to evaluation reporting by ITS Corridors funded under the CEF.
- Supporting the development of corridor evaluation plans and monitoring evaluation progress within the corridors through direct engagement.
- Ongoing maintenance and management of a comprehensive and well-structured European reference library and archive.
- Providing access to reference documents, guidance, evaluation plans and best practice examples, including archive reports and guidance produced under previous programmes.
- Planning, developing and maintaining an Evaluation Toolkit throughout the course of the CEF period with regular updates.
- Periodic global evaluation reporting, including the presentation of results from ITS Corridor evaluation reporting. The timing of these reports will be partly dependent on the timeframes of the works programmes and activities granted under the ITS CEF Call(s) but are defined as global Interim Report milestones followed by a Final Report.
- Evaluation plan development to facilitate the assessment of ITS priority action service deployments in EC-supported corridor projects (plus others).
- Data compilation of an evaluation data management system to facilitate analyses with state of the art methods from past programmes.
- Carry out analyses and draw conclusions on the viability of different priority action deployments in specific Operating Environments.
- Socio-economic assessment of ITS Directive priority actions.

- 
- Development of a Final Evaluation Report.
  - Ad hoc peer reviews of ITS Corridor / national evaluation plans and reporting as required throughout the programme.
  - Provision of helpdesk support for those working in the field of ITS Evaluation reporting as required throughout the programme.
  - Reviewing evaluation reports upon request.



## 2.1. EU EIP Evaluation Milestones

The EU EIP Evaluation Group, under this Activity, are responsible for delivering the following EU EIP Decision Milestones by the end of the eligibility period (December 2020, at the time of this report). It should be noted that, subject to the pending EU EIP extension request, some of these Milestones may eventually be delivered later than originally planned. Each Work Package is elaborated further in the following sections below:

64	Draft evaluation plan: ITS Directive priority actions	30/09/2016
65	Agreement and definition of Evaluation KPI for CEF ITS deployment	31/12/2016
66	Provision of guidance and templates for CEF EIP Evaluation	31/12/2016
67	Evaluation plan: ITS Directive priority actions	31/03/2017
68	Development of an ITS decision making toolkit model based on collected Evaluation data and Best Practice	30/06/2017
69	Interim Evaluation Report 1 (outcomes of first CEF call)	31/12/2018
70	First update of ITS Decision Making Toolkit	30/06/2019
71	Interim Evaluation Report 2 (outcomes of second CEF call)	31/12/2019
72	Workshop: Results of the ITS Directive Priority Action assessment and proposals for priority service coverage	30/09/2020
73	Second update of ITS Decision Making Toolkit	31/12/2020
74	Final Evaluation Report (CEF overview)	31/12/2020
75	Socio-economic assessment of ITS Directive priority actions	31/12/2020

## 2.2. Work Plan

The EU EIP Evaluation Group defined 5 separate but interrelated Work Packages against which all A5 related Milestones and deliverables have been aligned. These can be briefly summarised as follows:

- WP1 - ITS Directive Evaluation
- WP2 - KPI Definition
- WP3 – Guidance and Reference
- WP4 - Evaluation Toolkit
- WP5 - ITS Evaluation Reporting

The Evaluation group have established working groups / task forces to support the delivery of each specific work package and the related deliverables and / or milestones as required.

The table below shows the initial indicative breakdown of the A5 Work Packages and related Milestones / deliverables, along with a provisional indication of how the group membership would contribute to each planned deliverable and Milestone.

Task	Description	Lead	Co- Lead	Input members	Milestones / roles
1	ITS Directive Evaluation	Sweden	Finland	FR Cerema (NP), Netherlands, UM2 (SK), UK	<b>M64:</b> Draft evaluation plan: ITS Directive priority actions (30/09/2016)
			FR Cerema (NP), Finland	Netherlands, UM2 (SK), UK	<b>M67:</b> Evaluation plan: ITS Directive priority actions (31/03/2017)
			Finland	UM2 (SK), UK	<b>M72:</b> Workshop: Results of the ITS Directive Priority Action assessment and proposals for priority service coverage (30/9/2020)
			Finland	FR Cerema (Med), Netherlands, UM2 (SK), UK	<b>M75:</b> Socio-economic assessment of ITS Directive priority actions (31/12/2020)
2	KPI Definition	UK - HE	Germany BL	Sweden, Netherlands, Finland, Italy	<b>M65:</b> Agreement and definition of Evaluation KPI for CEF ITS deployment (31/12/2016)
3	Guidance and Reference	UK - HE	Germany-BASt	Finland, Italy, Germany BL	<b>M66:</b> Provision of guidance and templates for CEF EIP Evaluation (31/12/2016)
		UK-HE		Finland	<b>Maintenance of the Evaluation Library and website</b>
4	Evaluation Toolkit	UK - HE	FR Cerema (Med)	Finland, Italy, <i>DT-Basque Government</i>	<b>M68:</b> Development of an ITS decision-making toolkit model based on collected Evaluation data and Best Practice (30/06/2017)
		UK - HE	FR Cerema (Med)	Finland, Italy, <i>DT-Basque Government</i>	<b>M70:</b> First update of ITS Decision-Making Toolkit (30/6/2019)
		UK - HE	FR Cerema (Med)	Finland, Italy, <i>DT-Basque Government</i>	<b>M73:</b> Second update of ITS Decision-Making Toolkit (31/12/2020)
5	ITS Evaluation Reporting	UK - HE			<b>Progress Monitoring</b>
		UK - HE		FR Cerema (NP), Netherlands, Sweden	<b>M69:</b> Interim Evaluation Report 1 - outcomes of first CEF Call (31/12/2018)
		UK - HE		FR Cerema (NP), Netherlands, Sweden	<b>M71:</b> Interim Evaluation Report 2 - outcomes of second CEF Call (31/12/2019)
		UK - HE		FR Cerema (NP), Netherlands, Sweden	<b>M74:</b> Final Evaluation Report 2020 - CEF overview (31/12/2020)

Planned work and activities for the full duration of EU EIP within each Work Package can be summarised as follows:

### 2.2.1. ITS DIRECTIVE PRIORITY ACTIONS (WORK PACKAGE 1)

An Evaluation plan to facilitate the assessment of ITS priority action service deployments in EC-supported corridor projects (plus others) has been developed. This will enable robust estimates of the impacts, benefits and costs expressed in European KPIs. Relevant projects are selected from the ITS progress reports and results from these projects will be compiled in an evaluation data management system as well as in a report. This will facilitate analyses with state-of-the-art methods from past programmes where the impacts can be transformed into monetary values via the European unit cost values. Impacts with no commonly accepted valuation methods will also be assessed.

Depending on the results and level of detail in the selected projects the analyses will be carried out and conclusions drawn on the viability of different priority action deployments in specific Operating Environments. This will result in a tentative proposal for feasible coverage of each priority action developed including transferability and critical factors in deployment

A socio-economic assessment of ITS Directive priority actions will also be undertaken.

### 2.2.2. DEFINITION OF KPI (WORK PACKAGE 2)

Defining a list of harmonised and, where possible, consistent KPI for the purpose of harmonised reporting by ITS Corridors and the wider ITS community. It is hoped that this will facilitate the effective consolidation and synthesis of evaluation reporting from multiple ITS Corridors (and other sources) at the EU EIP / EU level.

A dedicated task force within the EU EIP evaluation group will develop a list of agreed KPI definitions on the basis of work undertaken in EIP+ and aligned to the parallel study by the European Commission. Following approval within the EU EIP group the final deliverable will be subject to EU EIP MSSA approval if required.

### 2.2.3. GUIDANCE AND TEMPLATES (WORK PACKAGE 3)

Provision of updated and revised Evaluation guidance and templates that are appropriate to address the needs of the ITS Corridors under CEF. The templates and guidance developed under EIP+ will be used as a basis. The revised Evaluation guidance and template will support the development of evaluation plans and monitor progress in conjunction with the Corridors. A dedicated task force within the EU EIP evaluation group will be established in order to develop appropriate guidance and evaluation report templates. Following approval within the EU EIP group the final deliverable will be subject to EU EIP MSSA approval if required.

Ongoing maintenance of a comprehensive and well-structured Evaluation reference library and archive which will provide access to reference documents, guidance, evaluation plans and best practice examples.

Whilst each ITS Corridor will be responsible for developing their own respective evaluation plans, this should be done on the basis of commonly agreed approach within the EU EIP Evaluation group. Provision of a common template and guidance will support the development of consistent corridor evaluation planning and reporting and, furthermore, will help to promote the delivery of more consistent and higher quality evaluation results.

The EU EIP Evaluation Group will additionally offer corridors / national bodies further technical support and expertise by undertaking peer reviews (as required) and addressing further specific evaluation related queries via the EU EIP evaluation helpdesk facility (accessible via the EU EIP website).

#### 2.2.4. ITS DECISION MAKING TOOLKIT (WORK PACKAGE 4)

Provision and maintenance of an Evaluation Toolkit throughout the course of the CEF period with regular periodic updates in order to incorporate up to date Evaluation Report information. The Toolkit will offer the possibility to further nurture a common European approach to ITS evaluation and could support decision making by providing access to an extensive set of evaluation results.

A dedicated task force within the EU EIP evaluation group will be established to plan and develop an appropriate ITS evaluation toolkit with consideration being given to providing a suitable resource with appropriate maintenance requirements.

#### 2.2.5. PROGRESS MONITORING

Reporting of technical and financial progress to EU EIP for the purpose of EU EIP Annual Status Reports ASRs and EU EIP JTS and MSSA progress updates as required.

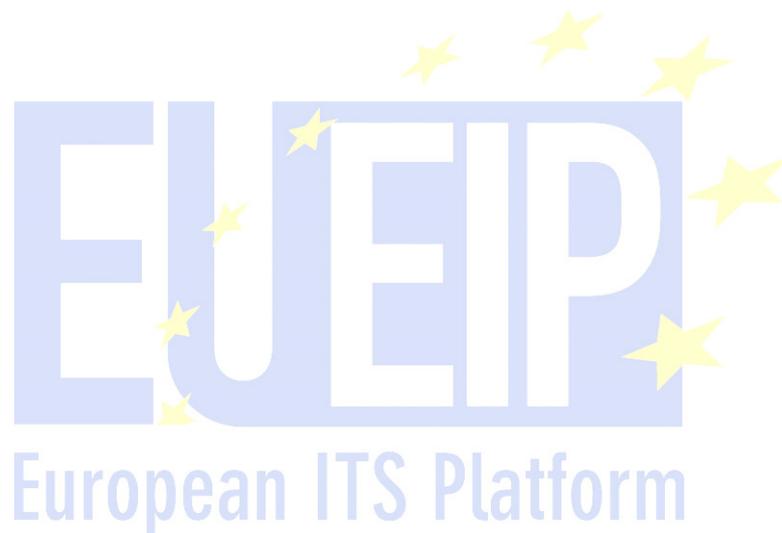
Regular periodic monitoring of ITS Corridor Evaluation Planning and Reporting. Each ITS Corridor will be responsible for accurately monitoring their respective evaluation plans and periodically reporting progress to the EU EIP Evaluation group. Interim and final evaluation report contributions will be submitted to the Evaluation Group for review. Ultimate responsibility for the management of Evaluation Plans and the delivery of good quality evaluation results resides with the corridors, but the EU EIP Evaluation Group provides a forum for knowledge transfer and best practice exchange as well as the expertise to support ITS Corridors in their Evaluation planning and reporting.

---

#### 2.2.6. INTERIM AND FINAL EVALUATION REPORT (WORK PACKAGE 5)

Interim reports will be provided and will cover progress in relation to the internal EU EIP Evaluation deliverables, as well as reporting of results based primarily on available ITS corridor evaluation results. The Final deliverable of the EU EIP Evaluation group will be a comprehensive overview of the group's findings in terms of the impact of ITS deployment under the CEF. The report will provide a consolidated overview and, where possible, a synthesis of the measurable impacts and cost benefit assessments of ITS investments based on the evaluation reporting received within the reporting period.

A separate final report will be produced for the assessment of the ITS Directive Priority actions.

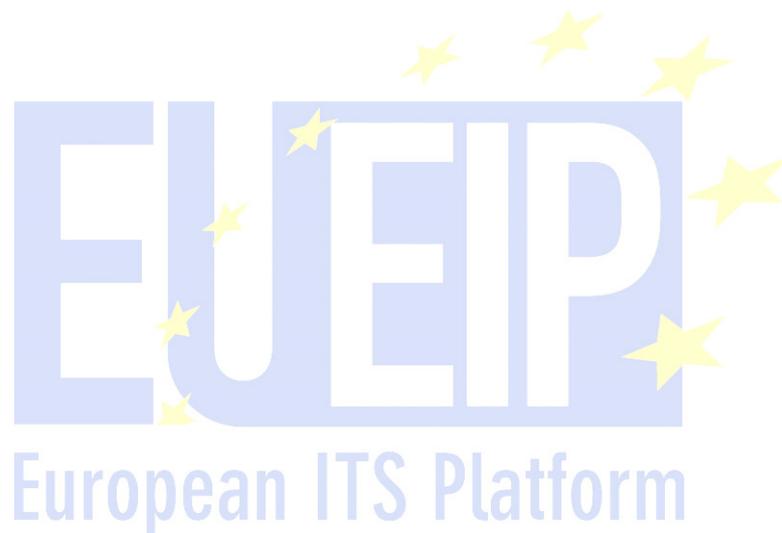


---

### **3. Report on EU EIP A5 achievements to date**

#### **3.1. ITS Directive Reporting**

In WP1 focus has been on developing a methodology and process to carry out the inventory of relevant projects in Europe. The ITS-progress reports have been used as a source of information and from them a list of more than 400 projects around Europe has been extracted. From this list the most suitable projects will be selected for further analysis. Inclusion criteria are based on reporting and quality of evaluation amongst others. This work is now ongoing and will be reported at a WP1 workshop in September 2020.



### 3.2. KPI Definitions

This task required the specification of a definitive list of practical ITS Deployment and Benefit KPIs for the ex-post evaluation of road-based ITS services. A KPI taskforce was set up in 2016, including representatives of the ITS corridors, as well as expertise from the wider Evaluation expert group. Active contributors to the KPI definition report included EU EIP representatives from Finland, Germany, Italy, Netherlands, Sweden and the United Kingdom as well as the ITS Corridor Evaluation leaders and DG MOVE. The wider EU EIP project team and Corridor community was then also involved in the review of the proposed KPI list. The objective of such co-operation was twofold:

- To ensure that knowledge matured from previous studies (EasyWay and EIP+) was translated in this latest piece of work; and
- To ensure that the developed list of KPIs could benefit from a wide consensus base from the start – hopefully reducing the need for future revisions.

The EU EIP deployment and benefit KPIs are presented in a technical report which was first circulated to all ITS Corridors in February 2017. This document was developed to present commonly agreed KPI definitions and suggested estimation methods in a single convenient and practical reference point for evaluators.

The content of the document draws significantly from various sources and work on the subject, in particular the ITS KPI definitions developed by DG MOVE, as well as the body of work relating to the EasyWay and EIP+ studies. For ease of reference, a shortlist of DG MOVE's KPIs has been included in the EU EIP KPI report. The report also provides a comparison of related (if not directly corresponding) EU/EIP and DG MOVE KPIs. It is important to note that whilst some differences in the KPI lists have been acknowledged, these do not represent 'mistakes or omissions' but should be considered within the context of applicability of said KPIs; specifically:

- EU/EIP KPIs are, generally speaking, more detailed and should be used primarily for evaluation purposes;
- DG MOVE KPIs are more 'generic' and should continue being employed by Member States as part their reporting duties to the Commission.

The KPI report, whilst providing a 'how to' guide relating to the estimation of KPIs, recognizes the fact that there exist country-specific data gathering / quality consistency issues. As such, the KPI evaluation guidelines do not represent mandatory requirements but, for the sake of consistency, it is *strongly advised that evaluators adopt such methodologies wherever possible* and that they consider opportunities for 'process-change' if this means a better alignment with the evaluation guidelines.

The EU EIP KPI description document does not intend to preclude the use of National standards/estimation methodologies but promotes the principles of 'Record and Explain'

---

key departures from the suggested guidelines. This approach can also be used to develop a 'knowledge database' (Values of Time, Value of Emissions, Value of a Life, Societal Discount rates, etc.) at a later stage if desired. In summary, where alternative methodologies are adopted by evaluators, it is required that *any significant divergence/departure from the guidelines remains well documented* and that impacts are, at least, qualitatively described.

The EU EIP KPI Definitions are intended to be a “practical document”, developed through consensus in conjunction with the wider policy and operational ITS communities. In this instance, on-the-field implementation and application of the guidance will tell us whether this objective has been met. Furthermore, the EU EIP project team recognizes the fact that, with time, the need may arise for additional KPIs to be added, while existing KPIs may need to be modified (or even removed), as the related technology evolves. For this reason, the KPI Definitions should be considered as a living document.

It is also important to note that the Benefit KPIs have been developed with the intention to facilitate the undertaking of consistent impact assessment within the corridors and, furthermore, to support the undertaking of Cost Benefit Analyses (CBAs) across all Corridors, in line with relevant CBA guidance.

Finally, it is important to note that the definition of the KPIs will in turn inform the structure and focus of future Evaluation Reports, as well as informing other A5 work packages relating to ITS Directive Priority Action Evaluation Plan and the development of the Evaluation Toolkit. These deliverables will be based, to a large extent and where applicable, on the basis of the KPI Definitions.

A copy of the ITS Deployment and Benefit KPI Definitions can be found [here](#).

---

### 3.3. Guidance and Reference

#### 3.3.1. WEBSITE

The Evaluation website is an Activity sub-site of the EU EIP website. The Evaluation subsite includes highlights of all major Evaluation deliverables and has been maintained throughout the duration of the Activity (<https://evaluation.its-platform.eu/>).

#### 3.3.2. EVALUATION LIBRARY

The Evaluation Library gathers all available Evaluation Reports, guidance and source materials in one place and has been regularly updated throughout the duration of the Activity to date. Here, all EU EIP compliant Evaluation Reports from the current ITS Corridors are stored in a single repository along with an archive of past and / or external evaluation reports from past programmes. The Library also stores all current EU EIP guidance materials (KPI Definitions, Report Templates, etc.) as well as historical guidance materials and sources from past programmes.

By the end of 2019, 35 EU EIP compliant evaluation reports from the current ITS Corridors were available via the EU EIP Evaluation Library. These are supplemented by an extensive archive of over 80 archive evaluation reports and guidance documents in an archive gathered from previous programmes.

#### 3.3.3. EU EIP EVALUATION REPORT TEMPLATE

The EU EIP Evaluation Report Template was developed by the A5 expert group in conjunction with the ITS Corridors

The EU EIP Activity 5 Evaluation Activity has issued the standard EU EIP Evaluation Report Template for use by ITS Corridors and the wider ITS community. This template includes integral step by step guidance for reporting bodies and has been meticulously prepared by a dedicated taskforce comprising a wide range of European ITS Evaluation experts and implementing ITS Corridors currently funded under the CEF. It is user-friendly, universal and designed to help and support those evaluating projects within the ITS Corridors, as well as in the wider ITS community.

The common EU EIP Evaluation Report Template will also help to ensure, as far as possible, that the outputs and results extracted from the evaluation of multiple ITS implementations are both consistent and harmonized. ITS projects are funded by Member States as well as by the European Commission and it is acknowledged that some Member States will have their own requirements for presenting evaluation results. The template has been developed with this in mind and adoption of this common format for presenting results will help to ensure that results of similar implementations can be compared as well as assisting in the transferability of results between sites and providing European Added Value.

---

The EU EIP Evaluation Report Template is closely aligned to the previously defined ITS KPI definitions as well as the EC ITS Directive Priority Actions and other classificatory documents such as the Operating Environments. To ensure coherence, links are provided to all relevant reference material within the Template.

Adoption of this Template and provision of reports in this common format will support consistency and, furthermore, will help to ensure that periodic “global” EU EIP reporting on overall progress towards the EC objectives of reducing congestion and emissions and improving safety can be prepared in the most effective and meaningful way.

The definitive EU EIP Evaluation Report Template can be found [here](#).



---

### 3.4. ITS Toolkit

#### 3.4.1. ITS TOOLKIT SPREADSHEET

The EU EIP Evaluation Toolkit is under-pinned by an Excel-based database which compiles key meta-data from each of the available EU EIP compliant Evaluation Reports as provided by the ITS Corridors. The Toolkit inputs are periodically provided by the ITS Corridors and are then integrated and maintained in a Master version of the Spreadsheet by the lead coordinator of the group. The Spreadsheet is then directly linked to the online user-interface (see below). Comprehensive updates to the spreadsheet are undertaken at 6-monthly intervals.

#### 3.4.2. USER INTERFACE

The EU EIP Evaluation Group launched the EU EIP ITS Toolkit in 2019. The Toolkit is a publically accessible online resource which enables users to filter an extensive database of ITS Evaluation Reports using up to 6 criteria in order to identify key information (metadata) and access evaluation reports relating to projects of specific interest or relevance to them. The objective of the EU EIP ITS Toolkit is to support decision makers (e.g., by highlighting the benefits of investment in specific ITS services, etc.), as well as researchers and even fellow ITS evaluators who are interested in understanding how to access best practice examples or evaluate comparable projects.

The EU EIP ITS Toolkit's online user-interface is based on a comprehensive database drawn from the current EC co-funded ITS corridors (Arc Atlantique, Crocodile, MedTIS, Next ITS, Ursa Major). All 50 reports for projects currently included have provided EU EIP compliant evaluation reports which consistently demonstrate the impacts and benefits of ITS investment on the Core and Comprehensive European road network. As the ITS Corridors progress and more data becomes available, the Toolkit will be periodically updated to include an even more extensive range of reports in what will be an ever-expanding 'live' online resource for the ITS Community in Europe and beyond.

The EU EIP ITS Toolkit is designed to be user-friendly and to provide quick access to key information in a clear, simple and efficient way, whilst also enabling access to more detailed information should users wish to delve further into more detailed aspects of ITS evaluation impacts, methodologies, etc. As such, users can select to filter the database by 6 key criteria (or combination thereof), namely:

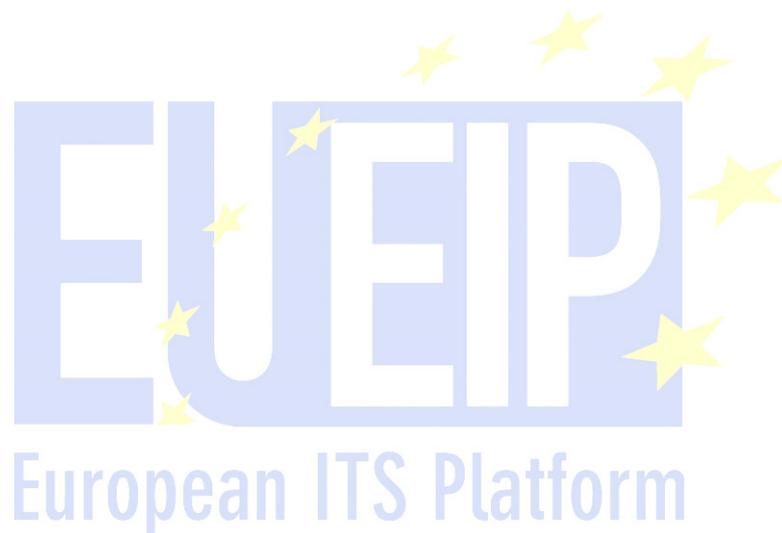
- Deployment KPI (Type of ITS Service)
- Benefit KPI (Impact of ITS deployment)
- ITS Corridor
- Country
- ITS Directive Priority Action
- ITS Directive Priority Area

---

By filtering in this way, EU EIP Toolkit users can then access the data they have searched by either exporting the metadata into a CSV file, or by directly accessing the related Evaluation Report documentation via the links provided by the Toolkit.

Extensive effort has been made by the EU EIP Activity 5 Evaluation Group in conjunction with the ITS Corridors in order to compile the ITS Toolkit and ensure that the outputs from it are as accessible, informative, consistent and useful as possible. The Toolkit will remain live and will continue to grow over the remainder of the EU EIP programme.

The EU EIP ITS Toolkit can be accessed via the following link: <https://its-toolkit.cslnn.co.uk>.



---

## 3.5. Evaluation Reporting

### 3.5.1. CORRIDOR INTERACTION

To date, the EU EIP Evaluation group has benefitted from regular reports and updates on evaluation planning, reporting and compliance from all of the ITS Corridors. In turn, the ITS corridors have been integral to the development of the EU EIP Evaluation deliverables and the usage of them. This has helped to ensure wider acceptance of / compliance with the EU EIP deliverables (e.g., KPI Definitions, Report Template and Guidance, etc).

### 3.5.2. INTERIM REPORT

The Interim Reports (as per this report) are intended to summarise:

- EU EIP A5 Achievements (i.e., progress to date in terms of internal deliverables / milestones)
- Summaries of the impacts and benefits of ITS deployment in Corridors



---

## 4. Summary of Corridor Results

### 4.1. Arc Atlantique

#### 4.1.1. OVERVIEW OF CORRIDOR

The purpose of the Arc Atlantique ITS Corridor is to accelerate the deployment of traditional and innovative Intelligent Transport Systems (ITS) systems and services on the Core and Comprehensive networks. This is with the key objectives of:

- Increasing the efficiency of the trans-European road network
- Improving safety
- Improving environmental performance

These objectives are consistent with the policy objectives of the EU, which is committed to reducing the overall cost of transport to the economic benefit of the Union, reducing societal impacts through improving the safety record of the network, delivering improved air quality, and contributing to the delivery of the Paris Agreement on climate change. Furthermore, through having a positive impact on congestion, particularly at bottlenecks, the ability for the Union to deliver goods and services more effectively supports transport cohesiveness, economic vitality and wellbeing.

To this end, the Arc Atlantique ITS corridor network is largely aligned with the North-Sea Mediterranean and Atlantic Core Network Corridors. Together, the corridors work towards improved multimodal transport links across the western reaches of the Union and for which the Arc Atlantique ITS corridor deploys technology and digital services on the road network.

Partner Member States comprise, Ireland, United Kingdom, the Netherlands, Belgium, France, Spain and Portugal and are supported and funded by the Connecting Europe Facility. The partners are all public highway authorities or concessionaires operating on behalf of public authorities.

#### **Targeting Known Problems, Adopting a Harmonised Approach**

The Arc Atlantique works in conjunction with the European ITS Platform (EU EIP) and the other ITS Corridors to build a common approach to deployment and makes use of agreed common performance indicators to measure impacts and benefits on the network.

The Arc Atlantique Corridor technological focus is to deploy ITS enabled traffic management and safety solutions in known problem areas such as bottlenecks, and on routes with chronic and acute congestion which cause increased transport costs, pollution, and are often associated with an unsatisfactory safety record.

Furthermore, it extends and builds digital communications and cross-border cooperation through the implementation of harmonised systems and services such as Real Time Traffic Information and Safety Related Traffic Information whilst contributing to

multimodal information via National Access Points. These are implemented in accordance with applicable European Regulations and assist Member States in meeting their obligations under the ITS Directive.

#### 4.1.2. SHOWCASE RESULTS

The Arc Atlantique is being implemented over 3 phases and is due to complete its work in 2021. The Corridor has delivered and will continue to deliver a number of achievements over its lifetime. The following highlights some of these achievements.

For the period to end of 2017 the total number of Real Time Traffic Information schemes implemented on the corridor was 22. The length of corridor that benefited from this service was 19,000km. The work included upgrades to traffic management centres and new digital communications. For the same period, 19 projects concerning Safety Related Traffic Information were implemented benefiting 7,600km of the network. Furthermore, the network received new and improved services in co-modal information, truck- parking and the roll out of DATEXII.

The Arc Atlantique implemented a further 36 ITS projects designed to deliver enhancements in traffic and congestion management, safety and environmental improvement, amongst others, at specific locations on the network.

Throughout the length of the ITS corridor, the improvements delivered to users and operators during the current phase can be measured by the increase to the Level of ITS Services resulting from the deployment of ITS on the network.

- 31 projects aimed at improving management of traffic is leading to an increase to the Level of Services in Traffic Management up to Levels 4 and 5.
- 30 projects aimed at improving traffic information will lead to an increase in the Level of Services in Traffic Information to Levels 4 and 5.

This impacts 16,000km of the network. An additional 21,000km of the network will benefit from improved DATEX connectivity. Level of Service definitions can be found at <https://www.its-platform.eu>.

#### **A85, A10, A11 A63, A6 – Conceded Motorways - France Enhancement of the Traffic Management Systems.**

Traffic monitoring projects, Ghost Vehicle (wrong way) Detection project, and the On-board Emergency Call Post project, have been helping to shorten the alert time allowing faster response times and reduction of incident risk with wrong way vehicles.

ITS systems that shorten response times for events or accident, indicate a reduction in the number of accidents and congestion levels on the concerned motorway networks of 1.6%.

Over a 5-year period of the Arc Atlantique program, after deployment of the ITS services, expected minima potential savings on French conceded motorways are:

- 7 Fatalities, 17 seriously injured and 143 slightly injured for the safety figures
- 136 000 hours lost,
- 565 000 fuel litres
- 1,524 CO2 tons for the congestion volumes

The socio-economic benefits corresponding to these savings, amount to € 5,190,390 per year, giving a return on the investment program of French motorway companies of approximately 3 years.

**AG-64 Spain - Traffic Control and Traffic Management ITS deployment.**

Deployment of Variable Message Signs, digital communications, detection and monitoring systems and weather stations. Deployment KPI - 64km of network improved, Benefit KPI - reduction in accidents by 15% over two years, 450k€ saving.

**M25 United Kingdom - Traffic Control / ITS Enabled Hard-shoulder Running.**

Deployment of Lane control, detection and monitoring systems to enable hard-shoulder running. Benefit KPI – Vehicle Lost Hours reduction of 4,400 hours a day, reduction in Killed and Seriously Injured – 15%, reduction in collision rate of 20%.

**M70/M50 Ireland - Lane Control Systems.**

Installation of lane control signing with VMS to moderate speeds and increase compliance. Benefit KPI - reduction in speed to national limits with expected increase in safety, reduction in pollution and more consistent flow to reduce congestion.

**4.1.3. IMPACT / ROI**

Using modelling it is possible to estimate the impact of the new and improved ITS systems and services on the Arc Atlantique 2 network over a period of 5 years, after deployment. Expected savings are as follows:

- 236 slight injuries saved per year (1180 slight injuries over 5 years)
- 28 seriously injured saved per year (140 seriously injured over 5 years)
- 11 fatalities saved per year (55 fatalities over 5 years)

Applying these different realistic hypotheses and taking into account the level of investment, the Arc Atlantique 2 programme as a whole will deliver minimum safety socio-economic savings of 36 M€ per year and a projected ROI of about 3 years.

---

## 4.2. Crocodile

### 4.2.1. OVERVIEW OF CORRIDOR

In the past major traffic events have led to congestion and traffic breakdown in Central and East European cross-border areas repeatedly. This region comprises several smaller countries with different languages and lots of cross-border traffic. In order to enable harmonised and efficient traffic flows along European transport corridors, cooperation and harmonised information exchange is of vital importance.

As a continuation of the first CROCODILE corridor project, CROCODILE phase 2 has pushed the harmonised exchange of dynamic traffic data and information across borders. Partners have worked together to implement an infrastructure for providing road traffic information. Efforts are being pursued in accordance with the EU ITS Directive and its supplementing Delegated Regulations. This encompasses coordination on organisational level, technical implementation of standards as well as enhancement of management strategies and end-user services. The latter are being improved so that road users can obtain more and better information through channels (e.g. websites, apps) that they are used to, thereby adding to the continuity of services as defined in the EU ITS Directive.

#### **Focus topics**

- Foster cross-border coordination of motorway operators
- Implement European legislation (EU ITS Directive and supplementing Delegated Regulations)
- Deploy equipment for data collection (CCTV, sensors)
- Improve infrastructure for data processing (Upgrade traffic management centres)
- Establish mechanisms for data access (National Access Points, DATEX II nodes)
- Provide relevant information to end-users (safety-critical, real-time, truck parking)

### 4.2.2. SHOWCASE RESULTS

The results agreed upon within CROCODILE include infrastructural measures like increasing the coverage of motorways with data collection and processing equipment and building new or improving traffic management centres.

Parking places will be equipped with dynamic information on truck parking services and fixed monitoring stations will be built or upgrade along the CROCODILE corridor network.

Organisational aspects include data exchange agreements, national DATEX II nodes and cross-border traffic management plans.

Ultimately, at least one web service will be delivered, which includes relevant traffic information from neighbouring countries.

There was a common sense visible that a national body has to be part of the public administration in order to ensure impartiality and shall be attached to an already existing organisation. The role of national access points will mostly be taken by national road operators.

Furthermore, the discussion revealed the necessity of bilateral agreements between Member States on traffic data which should be exchanged, corresponding to the specifications of the ITS Directive.

#### 4.2.3. IMPACT / ROI

Based on the first and second phase, CROCODILE 3 will further develop the results in discussions and technical workshops. In the background, this requires smooth processes along the whole value chain and effective coordination of actors. A CROCODILE strategy document will evaluate the data categories defined in the Delegated Regulation 2015/962 in respect of their relevance. It will also illustrate the possibilities for the application of standards and specifications (such as DATEX II, TN-ITS, ...) to the cross-border exchange of traffic data from an overall corridor perspective.

The following issues are in the focus of the CROCODILE corridor:

- **National Access Points**  
All over the European Union National Access Points have been established in accordance with the Delegated Regulations.
- **Static road data**  
Road operators throughout the whole CROCODILE corridor have been coordinating their efforts and already agreed on a common minimum of static road data most relevant for exchange.
- **Traffic management plans**  
Further TMPs are being designed based on extensive coordination between different road operators all over Europe in order to close the gaps along the TEN-T network and relevant interfaces to urban areas.  
The second issue includes digitalisation of TMPs and a comprehensible structuring of cause and effect when triggering a traffic management plan.

## 4.3. MedTIS

### 4.3.1. OVERVIEW OF CORRIDOR

The MedTIS main objective is to foster the implementation of ITS (Intelligent Transport Systems) for better Traffic Management Service and better Traffic information Service on the Core and Comprehensive networks of the Mediterranean Corridor. By contributing to the evolution of local traffic management modes towards coordinated and cross-border management modes, MedTIS has a key role in improving corridor efficiency in terms of road safety and capacity of the trans-European road network.

By developing its actions over nearly 9,000 km and relying on a budget of more than 50 million euros, MedTIS project directly addresses the objectives of the ITS directive to smooth road traffic on major networks whilst improving user safety and environmental performance. MedTIS is therefore perfectly in line with the EU's objectives of decreasing societal costs by reducing the number of road victims and improving air quality. These objectives have been stressed in the new EU mobility package and its action plan.

Gathering almost thirty public and private road operators from the Member States of Italy, France and the Iberian Peninsula, MedTIS contributes to a better management of a strategic axis serving several major ports such as Venice, Genoa, Marseille, Barcelona and Valencia. As such it addresses areas where the traffic conditions are often difficult with high levels of traffic, especially during summer migration periods, heavy truck traffic, large international flows, but also, in some sectors, significant commuter traffic.

Priority and main actions to improve control, information and traffic management are the following:

- The deployment of automatic event detection equipment,
- The deployment of the first on-board information systems,
- The deployment of speed control systems,
- The displaying of truck parking occupancy information.

Moreover, one of the key actions of MedTIS was to develop a flagship project: «cross-border travel time project» that has significantly improved the operations efficiency and the level of service on France-Spain and France-Italy borders.

From a close collaboration between the 3 cross-border operators, who developed their exchanges of traffic information and traffic data and thanks to Datex2, new border traffic management plans and generalized travel time services have been deployed between Spain, France and Italy.

Overall, from the beginning of 2014 to end of 2018, MedTIS program actions have deployed 85 projects.

Ten of them were assessed, using ex-post or ex-ante evaluations, based on EU EIP indicators (Change in accident numbers and severity, Change in bottleneck congestion, Change in CO2 emissions)

These evaluations relate to individual emblematic deployments of MedTIS2 Action

These projects, of local impact, have been deployed to better respond to the specific issues encountered on MedTIS2 network:

- Improving traffic management and reducing congestion on critical spots, such as the approach of big cities, and cross-border areas;
- Improving safety on tunnels and their surroundings;
- Improving quality of traffic and event information to users, including travel times information.

The deployments chosen for individual evaluations cover different road configurations (cross border sections, inter-urban sections, urban sections, mountain areas with tunnels), and different levels of equipment. So, the impact on benefit KPIs is different from one deployment to another.

Regarding impact on congestion and on environment, the benefits of those local projects can go from a reduction of 2 to 10% of lost hours and CO<sub>2</sub>-emissions volumes

Concerning safety, the benefits of those local projects can go from a reduction of 2 to 5% of accidents numbers

When comparing an individual deployment's costs and benefits, the results can be equally diverse, but all satisfactory: ROI are between 2 and 9 years, but most of them (8/10) are between 2 and 5 years.

New or enhanced traffic management services now covers more than 6,600 km of that corridor. New or enhanced Traffic information services now covers 2,300 km of that corridor.

This extension of proven traditional systems will bring significant benefits in the management and level of service of this ITS corridor and, through use of the most innovative telecommunication solutions, will facilitate the introduction of connected and automated vehicles. More precisely, on the 9,000 km of the MedTIS network:

- Nearly 100% of the network classified Level of Service 0 (no ITS service) switch to classification 1 (Basic travel information),
- Nearly 20% of the network classified Level of service 1 switch to classification 2 (Traffic information and traffic management per section),
- Nearly 10% of the network classified Level of service 2 switch to classification 3 (High level and sophisticated traffic management/information).

The general improvement in the level of congestion and road safety could therefore be significant and has to be highlighted with concrete figures.

For this purpose, and since a full evaluation of this type of program requires at least five years, it has become necessary to develop a methodology that can immediately and realistically extrapolate the full impact of this corridor programme. Overall, the operational and practical impact of most of the projects deployed in the program of motorway operators is to shorten response times in the case of an event or accident. These projects therefore make it possible to reduce the occurrence of secondary accidents. Founded on that basis, the methodology developed for this evaluation demonstrates that this ITS deployment programme potentially reduces both the number of accidents and congestion levels on the concerned motorway networks by 1.6%. This figure, which is well in line with those produced by other European reports delivered on the subject (e.g., OECD report: *Impact of new technologies on Road Safety*) leads to very significant impact results of the program.

#### 4.3.2. IMPACT / ROI

On the whole MedTIS 2 network, and over a period of 5 years, after deployment of the programme, one can expect potential savings of:

- 8 fatalities,
- 53 seriously injured and 277 slightly injured for the safety figures
- 642,000 hours lost
- 2,700,000 fuel litres
- 7,200 CO2 tonnes for the congestion volumes

#### **The socio-economic benefits**

The socio-economic benefits corresponding to these savings, calculated from the figures presented in the "handbook on external costs of transport on road safety", amount to € 9,417,430 per year. For the investment program deployed in MedTIS, that leads to a ROI of roughly 5 years.

As these overall results come from projects that do not cover all the actions deployed in the programme, they must be considered as minima results. In practice, the result will therefore be even better.

In conclusion, these various projects and actions are fulfilling the objectives and goals for which they were targeted. They have thus contributed significantly to improving traffic safety and fluidity as well as the environmental performance and continuity of service on the MedTIS 2 networks.

---

## 4.4. Next ITS

### 4.4.1. OVERVIEW OF CORRIDOR

The NEXT-ITS 2 corridor forms the Northern part of the Scandinavian–Mediterranean Corridor. The corridor connects Northern Europe with Western and Southern European transport networks. It offers the primary road transport connections between Western/Central Europe and Norway and the St. Petersburg region of Russia.

During the last decade increased traffic load and extensive presence of HGVs has made the NEXT-ITS corridor and core network vulnerable to disturbances. The road network of the sparsely populated areas of Northern Europe offers limited possibilities for alternative routes and large parts of the network is subject to recurring hard weather conditions, particularly in wintertime.

#### **Objective**

The main objective of the NEXT-ITS 2 has been to improve the network performance - in terms of efficiency, reliability, safety, and environmental impact - of the Northern part of the Scandinavian- Mediterranean CEF corridor from Oslo and the Finnish-Russian border in the north via Copenhagen, Hamburg, and Bremen to Hanover in Germany. Cross-border continuity of traffic management services have been targeted through coordinated deployment of Traffic Management services and major upgrades of Traffic Management centres.

The measures included in NEXT-ITS 2 have been chosen in order to fill the gaps concerning coverage, accessibility, dissemination, quality and content of the core traffic management services as well as to improve the cost-efficiency in the operation of traffic management. The following deployment projects were completed during NEXT-ITS2:

- Implementation and upgrade of Traffic Management Centres,
- Development and implementation of Traffic Management Plans,
- Update of roadside control software to enable service integration,
- Implementation and update of roadside information panels for driver information and control,
- Data fusion and data quality control at Traffic Management Centres.

As basic network for the assessment of the deployment KPIs of NEXT-ITS 2 measures, the comprehensive TEN-T Network has been used. The measures of NEXT-ITS 2 address mainly the Northern part of the Scandinavian-Mediterranean Corridor, but also influence the adjacent road network to the corridor and – in particular where general improvements and enhancements of traffic centres are carried out – larger parts of the main road network. Therefore NEXT-ITS 2 has estimated the impacts on the network which is influenced by the services deployed. The impacts are not limited to the NEXT-ITS Corridor but are the total estimated impacts on the affected network. The reason is

that NEXT-ITS 2 contained a number of deployments in relation to central systems in traffic management centres and these system upgrades in reality affect a larger network than just the corridor itself. Thus, when including all the costs in relation to the deployments, one should also include all the benefits.

#### 4.4.2. SHOWCASE RESULTS

##### NEXT-ITS 2 “showcase” project: **Network Control System/Traffic Management Plans Hannover-Braunschweig-Salzgitter (A2/A7/A39/391)**

The system is located in Niedersachsen on the motorways A2, A7, A39, A37, A391 and Federal Road B6 between the cities of Hannover, Braunschweig and Wolfsburg. The length of the network addressed is about 245 km. In the area where the system is implemented the important East-West connections (A2) between Western and Eastern Europe crosses the important North-South connection A7. In the vicinity of the cities of Hannover, Braunschweig and Wolfsburg several motorways around the cities are existing so that re-routing in case of congestion or incidents is possible to improve the traffic situation.

In total 10 large VMS have been installed at the motorway junctions. The system provides real-time on-trip information on congestion, traffic disruptions (problems, incidents) and re-routing recommendations via the VMS. It is being operated from the traffic centre and depending from the real-time traffic situation.

Re-routing recommendations are integrated so that the road users are informed about the possibly best routes in the case of congestion, incidents, accidents or other traffic problems on parts of the network.

By the information on congestion and possible alternative routes, the drivers can assess whether it is advantageous to choose another route. This may depend on the location of the congestion or incident and from the drivers' final destination. As a result, parts of the traffic will choose the alternative route which leads to time saving for these drivers.

Decreased congestion is expected on the original route, too. Safety (i.e. accidents with fatalities or injuries) might also be improved because end of queues are always critical points for accidents.

#### 4.4.3. IMPACT / ROI

##### **Costs**

When calculating the costs, all the costs related to those measures, which were fully deployed during NEXT-ITS 2 are included. Overall, the costs are included into CBA calculations if and only if the respective benefits are included, too. This explains the inclusion of Norwegian costs into the total costs, even if they did not receive any EC funding for their deployment; Norwegian figures are also included into the benefit calculations.

For 5-year period, the estimated implementation costs of all NEXT-ITS 2 deployment measures are circa 33 million € (including VAT), and the annual operation and maintenance costs circa of 3 Million €, resulting 15 M€ for five years.

The five-year costs:

- Implementation 33M€
- Maintenance and operation 15 M€
- Total costs 48 M€

### Benefits

The NEXT-ITS 2 evaluation has not determined a minimum benefit but was focused on estimating the “average” annual total benefits. The evaluation work did not include trying to estimate the level of minimum benefits, nor an interval of impacts. Instead the work was concentrated on performing a socio-economic assessment based on “average impact per year” and subsequent sensitivity analyses.

The following impact KPIs were included into CBA for NEXT-ITS2:

- Vehicle hours driven (h/year)
- Vehicle hours spent in congestion (h/year)
- Fatal accidents/Fatalities (number/year)
- Non-fatal injury accidents (number/year)
- CO2 emissions (tonnes/year)

Overall, the estimated main impacts of NEXT-ITS 2 measures are seen especially in improved traffic flow, indicated with the KPIs vehicle hours driven (reduced by 400,000 vehicle hours per year), and vehicle hours spent in congestion (reduced by 114,000 vehicle hours per year). This is a result of the deployed measures, which aims mostly at improving traffic and incident management, and supporting it with the improved traffic information.

In addition, nine thousand tons of CO2 emissions are avoided annually due to NEXT-ITS2 deployments. Moreover, the very conservative safety benefit estimate was an annual reduction of two severe accidents.

Even with these conservative estimates, the total value of the annual benefits in 2017 is calculated to be circa 12 Million €, which can be compared to the implementation costs of circa 33 million € (including VAT), and annual operation and maintenance costs 3 M€ (or 15 M€ for 5-year period), which leads to ROI of roughly 4 years.

The five-year benefits of NEXT-ITS2 deployments are the following:

- Vehicle hours driven - 2 035 000 h
- Vehicle hours spent in congestion - 571 000 h

- 
- Fatalities/fatal accidents - 0.51
  - Non-fatal injuries/injury accidents - 10.8
  - CO2 emissions - 45 600 tonnes



---

## 4.5. Ursa Major

### 4.5.1. OVERVIEW OF CORRIDOR

URSA MAJOR 2 targeted the deployment of ITS services to improve freight traffic on the TEN-T road network mainly along the RHINE-ALPINE and the Scandinavian Mediterranean Core network corridor, linking North-Sea ports, the Rhine and Ruhr area, metropolitan areas in southern Germany and in Italy. Parts of the Rhine-Danube core network corridor are also addressed due to important freight traffic routes linking these corridors in the middle of Europe.

International freight transport between EU Member States is one of the three main pillars for a Single Europe Economic Area. Improving services for international freight traffic along the mentioned corridors is the main European Added Value of URSA MAJOR 2.

Countries involved in the project are Germany, Italy and The Netherlands. Switzerland is an active partner without EU co-funding; Austria is included in its role of transit country, based on operational agreements for cross-border Traffic Management Plans.

#### **Evaluation, including GIS data tool support**

The main objective of the Evaluation activity is the assessment of the overall impact of Ursa Major Project on traffic efficiency, safety and environment, based on the results emerging from ex-post evaluation studies carried out by UM Partners. This means that the evaluation studies will be based on measured real impacts on mobility. Moreover, the comprehensive usage of Floating Car Data will complement the project-wise evaluation.

The study is performed within “SA 1.7 – Evaluation, including GIS data/tool support” led by Italy with contributions from European implementing bodies of URSA MAJOR 2.

#### **Most significant results emerging from the evaluated projects**

Below are the most significant results that emerged from the evaluation studies of the individual projects implemented in URSA MAJOR 2 (18 studies), divided by impact area.

- **Impact on Traffic Efficiency:** With regard to evaluated Ursa Major projects, the more remarkable impacts are the increase of traffic flow, intended as throughput, with Dynamic Line Management (DLM, +17%/+23%), the reduction of travel time with Dynamic Rerouting (DR) and DLM (-770,000 hours per year and -8%/-50%), a good percentage of rerouted users with DR (10%/43%), the reduction of Vehicle Hour Lost thanks to Traffic Monitoring and Management (TMM, -48%/-86%) and a good result in congestion cost savings with DR and TMM (-26 M€ per year and -6,000 €/ -55,000 € for 4 events).
- **Impact on Safety:** The analysis on safety reported in evaluated UM projects shows few results related to this area, where the most relevant indicator is the change in ratio between the number of accident and the

change in traffic flow, which results as -7% in a TMM implementation. Moreover, a safety campaign on VMS obtained 91% user satisfaction.

- Impact on Environment: The ITS service that presents more results within evaluated UM projects is the DLM, with a reduction in fuel consumption of -28%/-55% and a change in fine particle emissions equal to -75%. In a DR application, a reduction of -3,650 tons of CO2 per year was calculated.
- Other results: Other results presented in the analysed projects are different for each type of ITS; this makes it complex to compare data and to provide a final judgment on overall results. There is one result that must be mentioned, and is the improvement of the event detection time, which is reduced by -93%/-97% in one Ursa Major implementation.

#### 4.5.2. SHOWCASE RESULTS

<b>Project</b>	<b>Regiodesk: Improve accessibility with traffic management scenarios</b>
<b>Project reference (sub-activity)</b>	4.1
<b>Site</b>	The Netherlands, in the South-Holland area around Rotterdam and The Hague
<b>Short description</b>	The system is composed of elements such as VMS, ramp metering and traffic signal control that are already operating on the road network. By using them in a better way, these ITS allow for the optimised management of traffic and emergencies thanks to the combination of regional and municipal coordination centres
<b>BKPI</b>	Change in traffic flow (EUEIP-BKPI-N1) Change in bottleneck congestion (EUEIP-BKPI-N3)
<b>Impact on traffic efficiency</b>	Considering 4 incidents investigated: Vehicle Hours Lost (VHL): between -468 and 4.207 (reduction between 42% and 86%), in average -838 VHL During a rush hour estimated reduction of 6 - 11 VHL Cost savings: between 6.000 € and 55.000 €
<b>Impact on safety</b>	The reduction of traffic and emergency management time increases safety

<b>Impact on environment</b>	Limiting delays and congestion leads to emissions that are more similar to those of regular traffic
<b>Other results</b>	No other results
<b>Costs</b>	1,5 M€ per year for the 2012-2015 period
<b>Benefits</b>	43,82 M€ in 4 years
<b>Benefit-cost ratio</b>	7,3
<b>Transferability of the results</b>	The procedures and techniques used for optimization are very useful and easily transferable to regions of other countries

#### 4.5.3. IMPACT / ROI

Overall impact of the project through EC Key Performance Indicators

The overall impact of UM is based on a combination of the results of UM evaluated ITS implementations and impact data available in literature (and similar to ITS realized in UM), in order to have more solid statistical basis.

The results are expressed through the Key Performance Indicators defined by DG MOVE, using only those applicable and pertinent to UM implementations.

The first step is the calculation of KPIs for each type of ITS service, using combined data from the UM evaluation studies and from literature.

After that, the impact results are extended to the whole UM corridor using a weighted average of the indicators over the number of implemented projects for each ITS service type.

The following table represents the assessed average impact along routes where the ITS systems included in the UM Project have been implemented.

<b>Impact area</b>	<b>Benefit KPI along routes where UM - ITS has been implemented</b>	<b>Value</b>
Traffic efficiency	Change in journey time	-13%
	Change in traffic flow	+9%
Safety	Change in number of accidents	-34%
Environment	Change in annual CO2 emissions	-22%

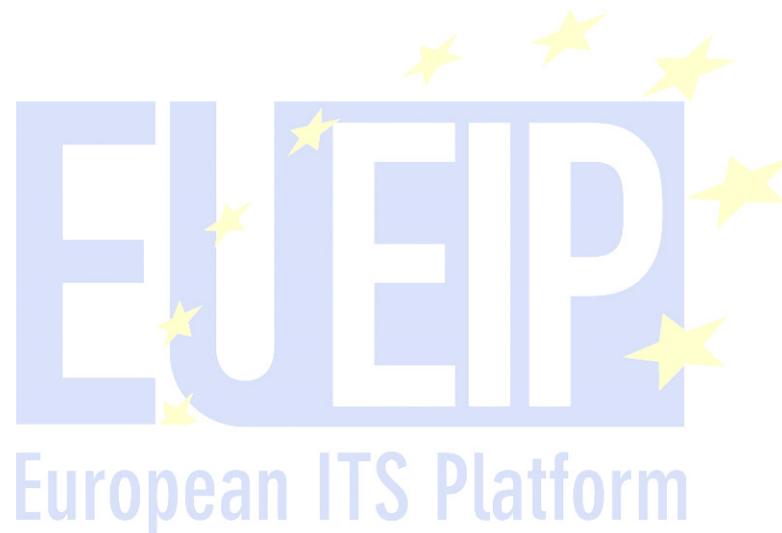
---

### **5 year estimated minimum benefit**

The estimation model applied only to the Italian and German Projects allows to estimate the following annual savings:

- Less 71 accidents with victims,
- Less 79 slightly injured people,
- Less 22 seriously injured people,
- Less 2 fatalities,

By transforming these benefits into economic value, it can be estimated a gain of 11,5 M€. For the estimation of the ROI the following basic calculation can be applied: Project Investment (€) / Annual savings (€) = Number of Years. As such, ROI = 45,878 M€ / 11,5 = 4 years.



---

## 4.6. Conclusions

### 4.6.1. SUMMARY OF KEY GLOBAL RESULTS

Based on available results from the 4 of the 5 ITS corridors, pan-corridor estimated global minimum 5-year safety benefits and return on investment (ROI) have been calculated.

In terms of minimum safety and socio-economical savings as a result of combined programme investments over a 5-year period, it can be concluded that:

- A minimum of 75 lives will be saved
- A minimum of 2,166 injuries will be prevented

### 4.6.2. IMPACT / ROI

In conclusion, as a result of these safety impacts alone, it is apparent that the combined ITS Corridor investments also result in a high financial benefit. Based on the combined investment of € 232 Million across the 4 ITS corridors, the following minimum savings based on safety benefits alone can be established:

- A minimum annual safety socio-economical saving of € 55 Million
- A minimum overall Return on Investment (ROI) of about 4 years on average
- Assuming an average lifetime of at least 10 years for these infrastructure components, a simplified calculation would suggest benefit-cost ratios of around 3 and higher.

European ITS Platform