EU EIP Activity 5: Evaluation

Interim Report 2: 2020

Final

Version: 1.0

Date: 2nd April 2021

Co-financed by the European Union
Connecting Europe Facility

Document Information

Authors

Name	Organisation
D. Cullern	Capita for Highways England
B. Fer	ASFA – France / MedTIS 3
M. Penttinen	VTT – Finland / NEXT-ITS 3
V. Baid	Sweco - Sweden
T. Geissler	BASt - Germany
H. Taale	Rijkswaterstaat - Netherlands

Distribution

Date	Version	Dissemination
March 2021	0.5	EU EIP A5 group
26 March 2021	0.6	EU EIP A5 group
2 April 2021	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 during 2020 as well as presenting an outline of the methodology to be used in calculating the eventual benefits of the ITS Deployment undertaken within the scope of the ongoing ITS Corridors for the purpose of the Final Evaluation Report (due end of 2021).

As reported below, the EU EIP Activity 5 Evaluation Expert Group has fully achieved the majority of planned Milestones within this timeframe and, in so doing, has continued to develop and promote the common evaluation approach for ITS Corridors which was developed earlier in the Action. Following the granting of a 1-year extension of the EU EIP, the remainder of the planned Milestones are now expected to be fully delivered by the end of 2021.

During the period covered by this report (2020), the common adopted approach to evaluation reporting has continued to yield consistent results from the ITS corridors in order to demonstrate the impact of the co-funded ITS investments in terms of safety, environment and congestion.

European ITS Platform

TABLE OF CONTENTS

Document Information 2

Preface 3

1. Scope and Composition of EU EIP Activity 5: Evaluation 6

1.1. Overview of Scope 6

1.2. EU EIP Evaluation Group Structure 6

2. General Progress and Achievements in 2020 7

2.1. Overview 7

2.2. General Contributions 8

2.2.1. EU EIP / Cross-Corridor Evaluation Workshop 8

2.2.2. Digitalization of Road Transport in Europe 9

3. Work Package Achievements (December 2020) 10

3.1. Work Plan 10

3.2. ITS Directive Reporting 11

3.3. KPI Definitions 12

3.4. Guidance and Reference 13

3.4.1. Website 13

3.4.2. Evaluation Library 13

3.4.3. EU EIP Evaluation Report Template 13

3.5. ITS Toolkit 15
3.5.1. ITS TOOLKIT SPREADSHEET 15
3.5.2. USER INTERFACE 15
3.6. Evaluation Reporting 16
3.6.1. CORRIDOR INTERACTION 16
3.6.2. INTERIM REPORT 2 16
3.6.3. FINAL REPORT 16

4. Outline Methodology for EU EIP A5 Final Report 17

4.1. Methodology for calculating minimum key benefits 17
4.2. Synthesis of Evaluation Results 18
4.3. Example method for calculating corridor level CBAs 19

5. Overview of Work planned for 2021 22

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 wider EU EIP Evaluation group is very well supported by experts from both the Member States and ITS Corridors. Representation to date has been stable and consistent and the group have worked effectively to deliver in accordance with the work programme and exchange knowledge and best practices in the field of ITS Evaluation.

Corridor representatives have played a crucial role in developing and promoting the common EU EIP Evaluation Group approach at the corridor level and, as such, have been instrumental in the general adoption of the common approach defined by A5.

The EU EIP Evaluation Group have continued to hold regular core group meetings (3 meetings during 2020). These meetings have been supplemented by ad hoc, Work Package or deliverable-specific web-conferences. Whilst the focus of each meeting varies in accordance with the pertinent issues and prevalent deliverables and milestones of the time, A5 core meetings regularly include updates in relation to each of the defined Work Packages as well as monitoring of ITS Corridor progress and best practice exchange as standard agenda points.

2. General Progress and Achievements in 2020

2.1. Overview

Building on the content of the 1st Interim Report (EU EIP A5: D5 - 2019), which provided a detailed overview of Activity 5 planned activities and progress to the end of 2019, this section provides an overview of the status of the Activity at the end of 2020 and provides a summary of progress in relation to the pre-defined work packages and deliverables since the previous report.

It should be noted that, in keeping with the other EU EIP Activities, the Evaluation Activity has been extended as part of the wider EU EIP Action extension. Consequently, selected Milestones relating to some Work Packages will now be delivered by the end of 2021. Being that these relate more or less to final reporting and completion of planned deliverables, this provides the added benefit of better alignment to the revised ITS Corridor timeframes (the majority of which are also extended). This will therefore allow additional time for the provision of Corridor evaluation results which, in turn, should allow a broader range of sources from which EU EIP can draw conclusions at the closure of the Action.

The EU EIP Evaluation Group, under this Activity, are responsible for delivering the following EU EIP Decision Milestones by the end of the extended eligibility period (December 2021). The table below provides an overview of the status of the planned EU EIP Activity 5 milestones at the end of the current reporting period (December 2020), and demonstrates that planned Milestones have been delivered as planned to date:

64	Draft evaluation plan: ITS Directive priority actions	Complete
65	Agreement and definition of Evaluation KPI for CEF ITS deployment	Complete
66	Provision of guidance and templates for CEF EIP Evaluation	Complete
67	Evaluation plan: ITS Directive priority actions	Complete
68	Development of an ITS decision making toolkit model based on collected Evaluation data and Best Practice	Complete
69	Interim Evaluation Report 1 (outcomes of first CEF call)	Complete
70	First update of ITS Decision Making Toolkit	Complete
71	Interim Evaluation Report 2 (outcomes of second CEF call)	Complete
72	Workshop: Results of the ITS Directive Priority Action assessment and proposals for priority service coverage	Complete
73	Second update of ITS Decision Making Toolkit	31/12/2021
74	Final Evaluation Report (CEF overview)	31/12/2021
75	Socio-economic assessment of ITS Directive priority actions	31/12/2021

2.2. General Contributions

2.2.1. EU EIP / Cross-Corridor Evaluation Workshop

The Cross-Corridor Cooperation Workshop, hosted by Arc Atlantique and EU EIP Activity took place on 5th and 6th February 2020 at ASFA (Paris, France).

The ITS Corridor Evaluation Workshop / Seminar was organised by Arc Atlantique and EU EIP Activity 5 – Evaluation. The purpose of the workshop was to educate delegates and to support the continual refinement of the approach to ITS Corridor evaluation. The workshop was deliberately timed to coincide with the ITS corridors preparing the latter stages of their deployment programmes and offered Corridors and experts from the wider community a platform to communicate their successes and benefits more widely and in a meaningful way to various stakeholders.

The event therefore aimed to facilitate cross corridor discussions concerning the evaluation process at the operational level (ITS corridors). It also assisted the dissemination of information relating to the EU EIP evaluation methodology and best practice, embedding the importance of evaluating ITS corridors using a harmonised approach by informing and educating participants. The workshop also served to identify a number of proposed actions which could enhance and consolidate the current approach. The event covered the presentation of specific technical examples and results and was attended by 25 participants from 9 EU Member States, incorporating representation from all of the ITS Corridors and the majority of core A5 expert group members.

2.2.2. DIGITALIZATION OF ROAD TRANSPORT IN EUROPE

EU EIP A5 provided extensive support to the EU EIP Joint Technical Secretariat / Future Taskforce by contributing to the *Digitalization of Road Transport in Europe* report. This report was designed to promote the benefits of ITS investment in Europe based on results from the Corridor phase 2 investments, and produced overall estimated minimum results in terms of safety and return on investment.

Based on available results from the 4 of the 5 ITS corridors, combined-corridor estimated "global" minimum 5-year safety benefits and return on investment (ROI) were calculated. In terms of minimum safety and socio-economical savings as a result of combined programme investments over a 5-year period, it was demonstrated that:

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

As a result of those safety impacts alone, it is apparent that the combined ITS Corridor investments also result in a significant financial benefit. Based on the combined investment of € 232 Million across the 4 phase 2 ITS corridors, the following minimum savings derived from those safety benefits were established as follows:

- 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.

3. Work Package Achievements (December 2020)

3.1. 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 following section of this report details progress within each defined Work Package during the current reporting period (2020).

3.2. ITS Directive Reporting

In WP1 focus has been on developing a methodology and process to carry out the inventory of relevant projects in Europe. This work is ongoing, and progress was reported at a WP1 workshop in September 2020 (Milestone 72). The goal of the workshop was to present early results from ITS directive priority actions assessment and proposals for service coverage and give input to further develop the assessment as an input to Milestone 75 Socio-economic assessment of ITS Directive priority actions.

For the assessment, a record of over 500 projects from 22 partner's National progress report was created in an excel tool, with a similar layout to the Evaluation toolkit. To aid with selection of most relevant projects for this evaluation, all partner countries were asked to select 2-3 most relevant projects with help of a template which was distributed from Swedish colleagues during summer. The initial results as per input received from 8 countries led to 22 selected projects with evaluation data.

The feedback from the workshop were taken into consideration to plan for activities in 2021 and more importantly to reach the final WP1 milestone, Milestone 75 which will be completed during 2021. To address the milestone, around 10 National progress reports from 2020 will be included in the assessment to get a better quality and updated data for the evaluation, along with 2017 National progress reports. The focus of the assessment will be on the 5 Priority services, where these services have been deployed, what is the coverage for such services and what are the benefits associated to the services etc. The Focus area of the assessment will include corridor projects from TEN-T network and also other local urban and rural network with more road coverage. As per the planned activities in 2021, the final Milestone can be delivered during late autumn in 2021 as an input to the overall consolidated evaluation report.

EUEIP European ITS Platform

3.3. KPI Definitions

This work package relates to the specification of a definitive list of practical ITS Deployment and Benefit KPIs for the evaluation of road based ITS services. A KPI taskforce, comprising ITS corridors and experts from the wider Evaluation expert group, developed and finalised the comprehensive KPI Definitions deliverable early in the current programme.

The EU EIP KPI Definitions were developed on the basis of multiple sources, including the ITS KPI definitions developed by DG MOVE for the purpose of Member State Reporting. The latter were necessarily more generic than the more detailed EU EIP KPI Definitions, which were developed for the purpose of ITS Corridor evaluation, although the two were nonetheless developed in parallel and are consistent with one another (Cf. KPI Definitions report for comparison).

The EU EIP KPI Definitions provide suggested methodologies for the calculation of benefits and take into account the fact that there exist country-specific data gathering / quality consistency issues. As such, the KPI Definitions recommend a best practice methodology whilst allowing for the possibility of local variation in line with national standards, etc., through a 'Record and Explain' principle.

At the time of their original development, the EU EIP project team recognized the fact that over time the need may arise for additional KPIs to be added and, furthermore, that existing KPIs may need to be modified (or even removed), as the related technologies and guidance evolved. As such, from the outset, the KPI Definitions were considered a living document.

During the current reporting period the EU EIP A5 Evaluation Group identified the need for a review of the KPI Definitions established at the beginning of the Action. Whilst it is not anticipated that significant revision is needed, it is nonetheless supposed that guidance in some aspects may need to be updated and, furthermore, that some additional KPIs may now be sufficiently mature to be added, particularly in the newer or more emerging fields of ITS which were not necessarily covered at the original time of development. As such, a Guidance Review working group was established and an initial meeting was held in order to brainstorm possible updates to the existing KPI Definitions document in November 2020.

Work on the Guidance Review, which also incorporates a review of the current Evaluation Report Template (cf. section 3.3 – Work Package 3, below), has begun and will be progressed during the next reporting period (2021).

It should be noted that, insofar as the current KPI Definitions directly inform the structure of other A5 work package deliverables, any required changes will be reflected across all deliverables as necessary in order to ensure consistency.

3.4. Guidance and Reference

3.4.1. WEBSITE

The Evaluation website is an Activity sub-site of the EU EIP website. The Evaluation subsite includes highlights for all major Evaluation deliverables and Activity updates and has been regularly updated throughout the duration of the Activity, including throughout the current reporting period (https://evaluation.its-platform.eu/).

The evaluation website also provides direct links to the Evaluation Library (section 3.3.2 below) and the Evaluation Toolkit (section 3.4, below).

3.4.2. EVALUATION LIBRARY

The Evaluation Library (https://evaluation.its-platform.eu/EvalLib) 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 2020, 52 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 evaluation reports and guidance documents gathered from previous programmes.

3.4.3. EU EIP EVALUATION REPORT TEMPLATE

The EU EIP Evaluation Report Template was developed by the A5 expert group in conjunction with the ITS Corridors earlier in the programme and was subsequently adopted as the standard report template for use by ITS Corridors. This template includes integral step by step guidance and helps to ensure, as far as possible, that the outputs and results extracted from the evaluation of ITS implementations in Corridors are both consistent and harmonized. This common format for presenting results will help to ensure that results of similar implementations are comparable 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 KPI definitions (see section 3.3, above) 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.

Full adoption of the Template by the ITS Corridors has led to the provision of 52 compliant reports by the end of 2020.

During the current reporting period (2020) the EU EIP A5 group undertook to review the current Template as part of the afore-mentioned general Guidance Review. The purpose of the review is to identify any possible need for adjustment either within the timeframe of the current reporting cycle or for the purpose of a possible future reporting cycle / follow-on programme. As such, a survey will be prepared in order to gather user feedback during the next reporting period (2021) and a possible update to the current template will be considered based on feedback received.

The EU EIP Evaluation Report Template can be found here.

3.5. ITS Toolkit

3.5.1. ITS Toolkit Spreadsheet

The publicly accessible online EU EIP Evaluation Toolkit User Interface 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 3.5.2, below). Comprehensive updates to the spreadsheet have been undertaken at periodic intervals to date and a final update will be completed before the end of the Action (December 2021).

3.5.2. User Interface

The EU EIP Evaluation Group launched the EU EIP ITS Toolkit in 2019. The Toolkit is a publicly 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 to support researchers and fellow ITS evaluators who wish to access best practice examples or evaluate comparable projects.

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.

During the current reporting period, the EU EIP ITS Toolkit was updated (July 2020) with additional project data. As such, it now incorporates data provided by 54 projects from the current EC co-funded ITS corridors (Arc Atlantique, Crocodile, MedTIS, Next ITS, Ursa Major). Another significant addition to the Toolkit UI during the current reporting period was the inclusion of direct links to related reports in the Evaluation Library, making it very simple for Toolkit Users to directly access related literature. Each of the linked reports demonstrate the impacts and benefits of ITS investment on the European road network in a consistent way and in compliance with the defined EU EIP approach.

As the ITS Corridors progress and more data becomes available, the Toolkit will continue to be periodically updated to include an even more extensive range of reports in an ever-expanding 'live' online resource. A final update will be completed before the end of the Action (December 2021).

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

3.6. Evaluation Reporting

3.6.1. Corridor Interaction

Throughout the current reporting period, the EU EIP Evaluation group has continued to benefit from regular reports and updates on evaluation planning, reporting and compliance from all of the current ITS Corridors. The ITS corridors have in turn been integral to the development of the core EU EIP Evaluation deliverables and the usage and application of them. This has helped to ensure wider acceptance of / compliance with the EU EIP evaluation approach (e.g., KPI Definitions, Report Template and Guidance, Evaluation Toolkit, etc).

During the 3 core group meetings held within the current reporting period (2020), several best practice technical presentations were provided to highlight specific achievements and results at national and Corridor level.

3.6.2. Interim Report 2

This report is the second Interim Report (2020) (Milestone 71) which, building on the information provided in Interim Report 1 (2019), summarises:

- EU EIP A5 Achievements throughout the reporting period (i.e., further progress to date in terms of internal deliverables / milestones during 2020)
- An outline of the methodology and approach to be used in the Final Report (Milestone 74 - 2021)

3.6.3. Final Report

The Final Report will be delivered at the end of the next reporting period (2021). It will summarise the EU EIP A5 achievements at the end of the programme as well as providing a summary of results and benefits of the ITS Corridor investments. An outline methodology for the results to be presented in the Final Report is presented in section 4 (below).

4. Outline Methodology for EU EIP A5 Final Report

The EU EIP A5 Final Report will be delivered at the end of 2021 and will provide an overview of the evaluation results of ITS investments within the co-funded ITS Corridors. This section considers the type of methodology, or methodologies, which will be used in order to pull together those results and draw the conclusions at the end of the EU EIP Action.

4.1. Methodology for calculating minimum key benefits

Within EU EIP, a methodology has been developed by ASFA partners for estimating safety, congestion and environment benefits as a result of project deployments. This ex-ante methodology can be applied at corridor level as well as at the level of individual national schemes and relies on the condition that baseline data prior to deployment, is available (safety data in terms of accident victims, congestion data in term of lost hours, environment data in term of CO2 emissions).

In situations where the congestion and environment data, prior to deployment, are not available, which is often the case, the methodology is difficult to apply in a complete and precise way.

In order to solve that issue, ASFA has recently developed a tool providing a means of estimating, from limited traffic data, the baseline congestion and environment data in terms of vehicle hours lost (VHL) and CO2 emissions prior to deployment.

With this new tool, which is an upstream companion to the approach used for estimating benefits, one therefore masters the whole chain of program global evaluation (data collection, data process, estimation of evaluation results).

Due to the lack of available congestion data at that time, this methodology has been applied partly on MedTis 2, Arc Atlantique 2 and Ursa Major 2, in order to derive the minimum estimated Safety benefits generated by the program and these are presented in the *Digitalization of Road Transport in Europe* report (see section 2.2.2 above). Furthermore, this methodology provides a means to calculate a corresponding minimum estimated Return on Investment (ROI) and the ROI presented in the *Digitalization of Road Transport in Europe* report has been calculated with this methodology.

This methodology enables benefits to be estimated based on sound rationale and assumptions and, if necessary, using just elementary baseline traffic data. It also provides realistic and credible results, particularly in areas where data may be missing or problematic.

This approach can therefore deliver global-level results which can clearly and effectively demonstrate the key benefits of ITS investment for use at the political level. The

methodology has already been successfully used to estimate the overall safety impact and ROI of the phase 2 corridor investments and, going forward, will be extremely useful as the scope expands to include minimum estimated congestion and environmental benefit results for the phase 3 corridors.

4.2. Synthesis of Evaluation Results

Estimating impacts of ITS deployment on the related network is historically problematic. It is indeed very difficult to calculate the relevant metrics, such as kilometres or hours driven, etc., concretely and estimation of such results can also be complicated. One possible solution is to make an extensive literature search, and to synthetise the potential results by critically analysing earlier results and comparing those into the target environment and context.

This approach was previously applied by the Viking evaluation group when collecting the information on potential results of co-modal information and travel time information services. In this way both national and available international databases were included in the search for evaluation studies relating to the studied services. It is important to bear in mind that, in scientific databases, etc., not everything is available and, as such, it is beneficial to conduct searches of multiple sources. In this way sources such Academia and ResearchGate have proven to be very good additions, as here research scientists can share studies which would otherwise only be available through conference attendance or specific scientific journals, etc.

Once such a search is completed, all of the found studies can then be analysed with the help of a specially created synthesis excel-tool. In the Viking approach the tool included fields for:

- description of the problem: where the service was deployed, and why? What was the problem to be solved with the deployment?
- description of the deployed system/service
- evaluation: timing and type; objectives of the evaluation; research questions; evaluation coverage (area); expected impacts/hypothesis; evaluation methods
- impacts: technical performance; impacts; reliability of the results; research questions answered
- Viking evaluation group expert assessment: overall assessment of the evaluation done; transferability of the results

Based on the above listed items, the overall synthesis of the impacts of the studied services can then be made, including the average impacts or impact ranges (if available/possible to summarise based on the studies) and also, last but not least, the overall expert assessment of the transferability of the results into the target environment and context.

4.3. Example method for calculating corridor level CBAs

NEXT-ITS corridor has provided a unified corridor-level benefit and hence CBA-calculations in earlier phases (NEXT-ITS1 and NEXT-ITS2) and is using a similar approach for NEXT-ITS3 evaluation. The steps and pre-assumptions used in NEXT-ITS evaluation groups are listed in short below. More extensive methodology and calculations can be found in NEXT-ITS evaluation reports.

1. A comprehensive and detailed list of "deployments", i.e. in each member state is made. In NEXT-ITS2 there were 7 measures in total. These measures typically included more than one service, especially if the measure covered central (traffic management centre) improvements (table 1).

Table 1. Measures and services in NEXT-ITS2.

Measure(s) per Country	Forecast and real-time event	Traffic Condition and Travel Time	Weather Information Service	Safety Related Traffic Information Service	Dynamic Lane Management	Variable Speed Limits	Incident Warning and Management	Ramp Metering	Traffic Management Plans for Corridors
Measure 1 – TMC renewal and adaptation to corridor management and control systems, FI	X		X		X	X	X		X
Measure 2 – Motorway Control System, SE	X	X		X	X		X		X
Measure 3 - Integrated Traffic Management, SE	X	X		X	X		X		X
Measure 4 - New Traffic Management Centre in "The Traffic Tower" in Copenhagen, DK		X		X			X		X
Measure 5 - Traffic Management Plans and Ramp Metering Systems, DE		X						X	X
Measure 6 - Traffic Centre Schleswig-Holstein, DE				X					
Measure 7 - DATEX-II improvements for Action C, NO				X					

2. The second step is to identify the relevant road networks which the deployments listed in table 1 are affecting. If the measure is covering only a certain road section - and

including e.g. road-side implementations, then the identification is quite straight forward. In the case of central traffic management centre improvements, the measure may affect various networks and include, for example, all of the above listed services on more advanced networks (e.g. main motorway sections or tunnels) as well as small improvements benefiting lower level road networks (e.g. improvements of road weather services for all main roads). Therefore, this step is quite critical - and may need a few adjustment rounds.

3. When the road sections, and hence networks, are identified, the third step is to find out the basic statistics for those networks. For the basic statistics, the following indicators are listed/calculated for the time/situation before the deployments:
   - network length (assumed to remain the same after the deployments)
   - vehicle kilometres driven
   - vehicle hours driven
   - vehicle hours lost due to congestion
   - accidents in the network (fatalities and injured, or fatal accidents and injury accidents) - e.g. 3-year average used
   - CO2 emissions
4. The typical impacts of each individual service listed in table 2, e.g. variable speed limits, are estimated based on an extensive literature search, along with as much ex-post evaluation results as possible. An impact table (table 2) is then created based on the search. It is important to keep in mind that the values selected for the table are context specific, estimated to be valid for the NEXT-ITS road network.

Table 2. Impacts per service - NEXT-ITS2 network.

KPI	Forecast and real-time event information	Traffic condition and travel time information	Safety related traffic information	Weather information service	Dynamic lane management	Variable Speed Limits	Incident Warning and management	Ramp metering	Traffic management plans
Veh hours driven	-0.4 %	-0.2 %	-0.5 %	-0.03 %	-0.03 %	-0.3 %	-2.0 %	-1.0 %	-0.3 %
Veh hours congestion	-1.0 %	-1.5 %	-1.5 %	-0.05 %	-0.3 %	-0.5 %	-10.0 %	-10.0 %	-3.0 %
Fatalities/ Fatal accidents	-0.5 %	0.0 %	-3.0 %	-3.0 %	-7.0 %	-8.0 %	-1.0 %	-3.0 %	0.0 %
Non-fatal injury accidents	-0.5 %	0.0 %	-3.0 %	-3.0 %	-7.0 %	-8.0 %	-1.0 %	-3.0 %	0.0 %
CO_2 emissions	-0.4 %	-0.2 %	-0.5 %	-0.03 %	-0.03 %	-0.3 %	-2.0 %	-1.0 %	-0.3 %

5. An excel tool is then created to calculate the (ex-ante) impacts/benefits of the services for each road network.
6. The benefits are calculated into monetary format with the national unit costs through a corresponding table.
7. The network level benefits are calculated by summarising the benefits of each country to achieve a unified NEXT-ITS corridor CBA.

5. Overview of Work planned for 2021

During the remainder of the EU EIP programme to the end of 2021, the EU EIP Evaluation Group (Activity 5) will complete the remainder of the pending Activity 5 specific Milestones as follows:

73	Second update of ITS Decision Making Toolkit	31/12/2021
74	Final Evaluation Report (CEF overview)	31/12/2021
75	Socio-economic assessment of ITS Directive priority actions	31/12/2021

How these deliverables will be achieved is detailed in the relevant sections above but, to summarise, the focus areas for the remainder of the EU EIP timeframe will include:

- The completion of the Socio-economic assessment of the Priority Services based on the ongoing review of national reports.
- The ongoing update of the ITS Toolkit and related online user interface with further data extracted from additional compliant evaluation reports received.
- The completion of the Final A5 Evaluation report, which will collect and draw on corridor results in order to make a general global assessment of the impacts and benefits of ITS investments.
- Ongoing interaction with Corridors and wider expert community to support progress monitoring, best practice exchange and knowledge transfer.
- The review and update of the guidance tools developed by EU EIP A5 earlier in the programme (KPI Definitions and report template).
- Ongoing maintenance of the EU EIP Evaluation library, including the integration of further reports and reference sources.
- Ongoing management of the EU EIP Evaluation Activity subsite and development of a corresponding Achievements webpage.
- Ongoing promotion of results reported, including participation in EU EIP Webinar on *Digitalization of Road Transport in Europe* report and other promotional / communication related activities.
- 4 further meetings core of the EU EIP Evaluation Group as well as ad hoc working group meetings to address specific issues as required. For the foreseeable future these will take place remotely, although physical meetings will resume later in the year if it is possible to do so.