East – West Corridor

ITS Road Map for an Operational East – West Corridor across Northern Europe

EU EIP – European ITS Platform – Activity 3

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Preface

The "EU ITS Platform" (EU EIP[1]) is a co funded project of the European Union, where National Ministries, Road Authorities, Road Operators and partners from the private and public sectors cooperate to foster, accelerate and optimise current and future ITS deployments and services in Europe in a harmonised way.

This report forms part of Activity 3 under the EU EIP called Feasibility Study East-West Corridor (including first pilot implementation intermodal route planner) - (the Activity).

The Project is led by the Netherlands with active support and contribution from Ireland, the United Kingdom, Netherlands, Germany, Poland, Latvia, Lithuania, Estonia and Finland.

The project was promoted by the EU EIP due the experience of its members in elaborating requirements for seamless, continuous and harmonized ITS services and ITS systems on long distance ITS corridors arising from their active engagement in the current CEF ITS deployment corridors such as Next-ITS, URSA MAJOR and the Arc Atlantique.

This report is the culmination of the Activity and follows a series of consultation exercises with road authorities, analysis of information and workshops where consideration has been given to a vision, the benefits arising from establishing an East – West corridor, and creation of a potential road map to implementation of the corridor.

This report uses the *East – West Corridor Feasibility Study* as a key input for the ITS Road Map for an Operational East – West Corridor across Northern Europe.

Both, the study as well as the road map, will be provided to the North Sea - Mediterranean and North Sea – Baltic core network corridor working groups for future consolidated consideration of ITS on roads with regard to this important European East – West axis.

Acknowledgement

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[1] 2014-EU-TM-0317-S

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1. Executive Summary

Harmonised deployment of Intelligent Transport Systems (ITS) on Europe's trunk road network, as part of the Trans-European Network for Transport (TEN-T), has proven to provide cost-effective solutions for mobility, safety and the environment and is an essential policy element of the European Commission. To make a corridor function as such it requires a close cooperation of the relevant Member States and road operators.

Core Network Corridors are one important pillar of today's European transport policy that addresses all modes of transport. ITS deployment has recently been included in this concept with ITS Deployment Corridors aligning with the Core Network Corridors, but addressing the specific nature of road traffic and transport. In particular, road corridors have a stronger network structure than, e.g., rail or inland waterways. Many ITS for roads benefits are actually based on rerouting traffic or combining link oriented services on different links in a meshed network.

Looking at the current corridor map most ITS corridors have a north – south orientation. Apart from MED-TIS along the Mediterranean Sea, an east - west corridor for ITS is missing, while the Baltic states are not covered by an ITS corridor at all. Therefore, under the European ITS Platform, EU EIP, an activity A3, “East West corridor”, or EWC, was executed to explore the potential for such an East West corridor. The activity ran from summer 2015 till summer 2017 and covered the north of the North Sea Mediterranean core network corridor and the North Sea - Baltic corridor. The activity consisted of sub-activities: (1) creating a cooperating community of road authorities of the involved Member States; (2) execute a feasibility study based on planned ITS deployments till 2020 and (3) develop a roadmap for the deployment of ITS along the East West corridor for the near term and the long term. Additionally, a pilot implementation of a free intermodal route planner for containers was undertaken, covering over 90% of all the terminals and transporters along the corridor.

Roadmap for the East – West Corridor.

After the feasibility study had shown the potential of an East West corridor and identified those services and conditions where ITS could be implemented to fill gaps, where harmonization would allow for international services, or ITS could support cross-border or long-distance services, this report proposes a road map for the deployment of ITS along the corridor. In a harmonized way, with a vision based on different stakeholders’ perspectives, indications for funding, and guidance for governance where it would be relevant as well as further recommendations.

Since harmonization and international services along the EWC would be most relevant for freight transport and the geographic situation that the Baltic Sea, the North Sea and the Irish Sea are both barriers and opportunities for the corridor, it is clear that there should be cooperation, not just between road authorities but also between road authorities and hubs, in particular ports and ferry services, which already is emerging in some parts. Also the fact that EWC brings together regions with a different background, such as the central-western part where ITS has been implemented for decades and now the deployment of new services, such as C-ITS is starting, and other parts where ITS is only recently being deployed, provides benefits of exchange of best practice, which can be an example for other areas in Europe too.

ITS services have been clustered in Safety and Flow Enhancement – SFE, Freight Support – FS, and Traffic Management Plan – TMP. Additionally, C-ITS was included as a new development where existing services can be delivered in a new way or completely new services may emerge, both with a strong role of the market. Following the input about plans in the Member States they were mapped into near term (till 2020), and based on the vision and other inputs, long term (2020+). Combined with the vision and other road maps in the field of ITS the road map was developed.

Potential European and international funding sources have been listed, e.g. CEF generic funds, CEF cohesion funds, INTERREG.

For organization and governance several scenarios were considered. A new East West ITS corridor could be created but that would overlap with existing ITS corridors Arc Atlantique and Ursa Major, which would require extra overhead for those who already participate there. Therefore, a virtual corridor is favoured, where Arc Atlantique, Ursa Major, Next-ITS have included an activity for cross corridor cooperation, and a possible new ITS corridor project might be added for Poland and the Baltic states. The “coordination” and exchange of best practice could then be organized in the European ITS Platform, EU EIP, for the near term till 2020. A proposal for that has already been made. A link to the relevant CEF core network corridors should best be established as well, in the first place with the North Sea – Baltic corridor where a flagship project ITS is foreseen and the North Sea – Mediterranean corridor.

2. Introduction

This report forms the final deliverable for Task 1 of the Activity A3 – *Feasibility study East-West Corridor and first pilot Implementation* under the EU EIP (European ITS Platform). The Task comprised three sub-tasks:

1. Creation of a cooperating ITS community along the East West Corridor and inventory of planned ITS investments for seamless services
2. Feasibility study of selected planned ITS investments for European seamless services
3. Recommendations for roll-out of seamless ITS services on the East-West corridor.

As second task of Activity 3 comprised a *First pilot implementation of intermodal route planner* and is covered by separate deliverables.

The recommendations for roll-out of seamless ITS services (sub-task 3) form an ***ITS Road Map for an Operational East – West Corridor across Northern Europe***. This document seeks to elucidate work undertaken in the inventory phase[2] and in the feasibility study[3] into a document that can be used to inform policy and guide future consultations on implementing an East – West ITS corridor.

The emphasis in this document is to explain the background to the proposal for instituting an East – West corridor, a vision as to what an East – West corridor might look like, and a potential road map for the further collaboration and deployment of harmonised ITS systems and services on the corridor.

The feasibility study published under sub-task 2 proposed harmonised deployment of *Intelligent Transport Systems* (ITS) on Europe's trunk road network as an essential policy element of the European Commission. But to be successful close cooperation of the relevant Member States and road operators is required, and this had already been demonstrated by the successful implementation of ITS Corridors under CEF such as Arc Atlantique, URSA MAJOR and Next-ITS. These existing corridors largely run in north – south orientations as do the CEF Core Network Corridors, for instance the North Sea – Baltic and North Sea – Mediterranean corridors. A natural development of the CEF ITS corridors has been to align with the CEF Core Network Corridors.

[2] The results are described in the working document 'Feasibility Study East-West Corridor and First Pilot Implementation', EU EIP, March 2016.

[3] The results are described in the report 'East West Corridor - Feasibility Study report on seamless ITS services on East-West corridor', EU EIP, June 2017.

The feasibility study posed the question about what, if anything, is being done to support efficient transport in an East – West direction across northern Europe where significant travel demand and congestion arises particularly between the UK, The Netherlands, Germany and Poland but also extending to Ireland in the West and the Baltic States and Finland in the North-East of Europe.

A major proportion of long-distance traffic on the East – West Corridor (EWC) is generated by freight transport; whereas private passenger transport plays a lessor role. The study concluded that whilst certain ITS deployments were planned for the near term up to 2020 there was little, if anything, in the way of cooperation or deployment of harmonised services between road authorities and operators in the context of an East – West ITS corridor. Further, that there was no medium to longer term strategic planning for the period 2020 onwards.

Notwithstanding this, the characteristics of the East West route in terms of geographical location, inherent traffic conditions, prominence of barriers to East West connectivity arising from the Irish Sea, North Sea and Baltic Sea suggest that a common set of harmonised ITS services would increase efficiency of the network. This has been experienced on other CEF ITS Corridors. Supporting and facilitating intermodal transport would have merits due to the need to use shipping and rail to travel along the corridor. Trialling of an intermodal route planner has been part of this Activity and is the subject of a separate report.

The study also found that the characteristics in terms of maturity of ITS provision varies with the far (north) Eastern and Western stretches of the corridor focussing on deployment of traditional, proven ITS and the central section's commencing pilots in C-ITS.

The illustration below defines the geographical extent of the East – West Corridor which is the subject of this report. The network is largely coincident with CEF Core Network corridors as defined by TEN-T, in particular the North Sea - Baltic and North Sea - Mediterranean Corridors.

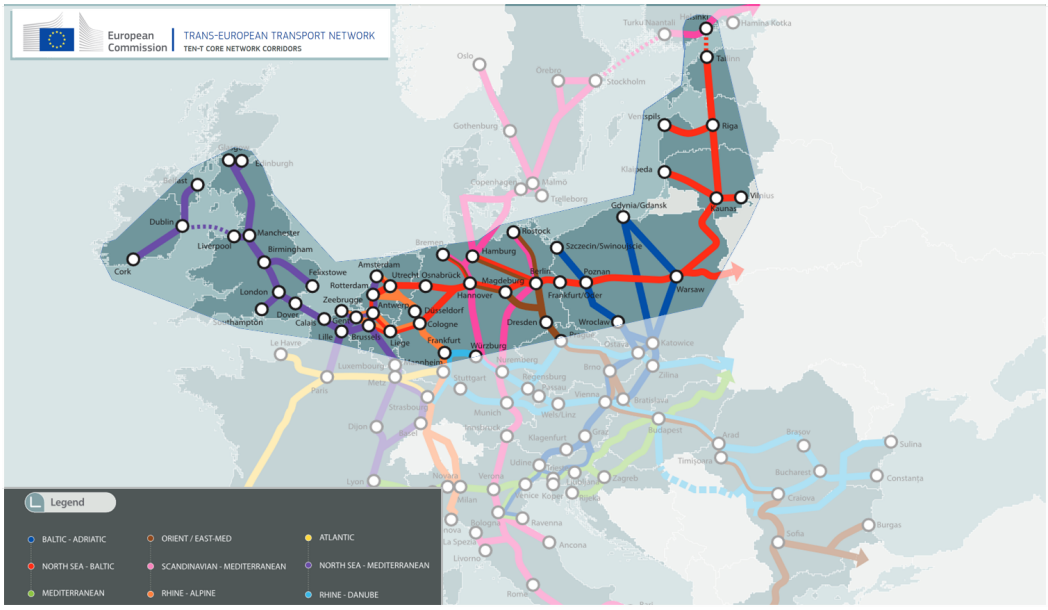

Figure 1: Geographic scope of the East-West corridor of the EU EIP project

3. The Challenge

The challenge that Member States and the EU face is to improve safety of the transport network and increase its efficiency so that it supports and strengthens the economies of Europe. This is at the same time as promoting sustainability, reducing environmental impact and mitigating climate change.

There is a large body of evidence that proves efficient transport networks using all modes, has a direct correlation with regeneration and economic growth. Road however remains foremost, and road transport has known challenges arising through lack of capacity, poor reliability and environmental impact. Furthermore, road transport has a variable safety record across Europe often linked with volume of traffic, road capacity, engineering design, ability of operators to address these factors in a responsive manner, and other notable reasons. The cost of poor safety on the road network is understood and the safety record of road links and nodes is invariably used to inform business cases for improvements or upgrades to road networks.

With this as a background the harmonised deployment of Intelligent Transport Systems (ITS) on Europe's trunk road network, as part of the Trans-European Network for Transport (TEN-T), has been an essential policy of the European Commission to impact these challenges. Accordingly, from 2007 the EU has promoted the wider deployment of ITS via EasyWay, and since 2012 this has been in the form of 5 ITS corridors that are now largely aligned with the CEF Core Network Corridors.

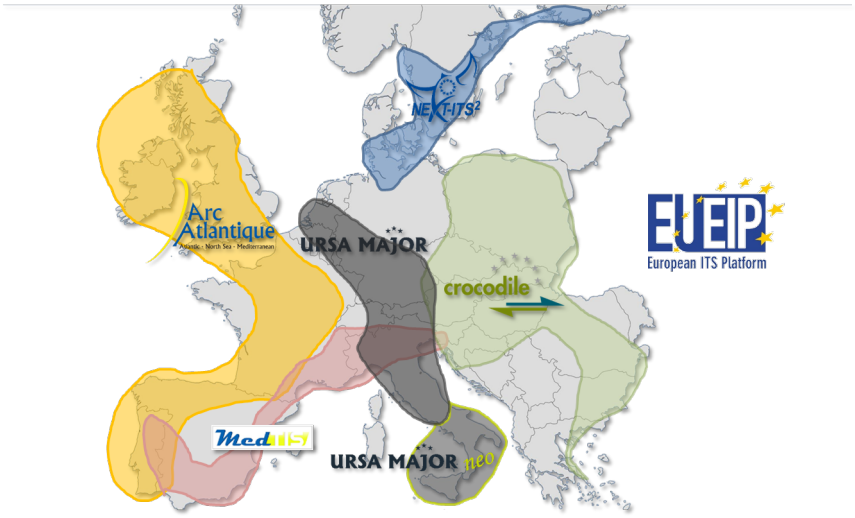

Figure 2- Core Network Corridors and ITS Deployment Corridors

To illustrate this, Figure depicts the current ITS Deployment Corridors as an overlay to the map of the Core Network Corridors.

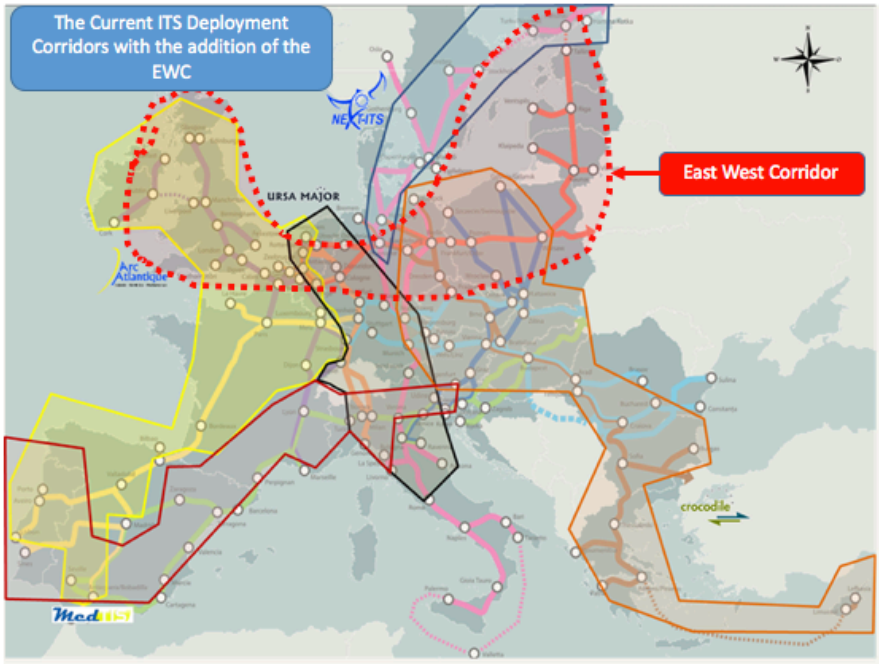

Figure 3- East – West Corridor in relation to existing ITS Deployment Corridors

Figure 3 depicts the location and extent of East – West ITS Deployment Corridor in the context of the existing corridors and emphasises the East – West nature of the corridor route in northern Europe.

Given the strong case for establishing coordinated (ITS) corridors, exemplified by creation of the 5 ITS corridors and Core Network corridors, the challenge is what would it take to establish an East – West corridor along the lines of the existing ones. Ideally, the specific characteristics of traffic on this corridor, in particular long-distance traffic, would need to be analysed in order to determine which types of ITS services, and potentially also which level of ITS service, would need to be considered for corridor-wide and harmonised deployment. A detailed study of this type, specifically concerning road traffic, would take time, so drawing on relevant Member States' plans for ITS deployment in the shorter (near) term is a strong indicator of need, although these will not be planned in the context of an East – West corridor.

Establishing the corridor either as a real or virtual entity, agreeing to, and subsequent promotion of a road map will begin alignment of thinking and planning. Given deployment of ITS requires a close cooperation of the relevant Member States and road operators, engaging relevant stakeholders will be the initial challenge.

4. Meeting the Challenge through establishing an East – West ITS Corridor

The main purpose of a corridor approach for harmonised ITS deployment is to identify transport that has a characteristic traffic flow which can be defined by certain, corridor specific criteria. This aspect of "common criteria" can also be read as "common requirements" and implies the basic assumption that a common set of harmonised ITS services should be deployed in the particular corridor.

Besides the before mentioned east-west orientation, the main immediate characteristics of the East – West Corridor are the extreme geographical length and the dominant role of the Irish Sea, the North Sea and the Baltic Sea that traffic travelling along this corridor has to cross or could consider as an alternative route. This already implies an inherent inter-modal aspect of the corridor, since road traffic on this corridor is forced to consider ferry links or the rail link via the channel tunnel.

Another important aspect to consider is that the East – West Corridor is specific in the sense that it is a corridor that combines two lines of history with respect to ITS implementation. In north-west Europe, ITS deployment has started early (in the late 90ies) in the scope of the so-called *Euro Regional Projects* (STREETWISE, CENTRICO and VIKING). These areas already have a high density of ITS implementations today, and in some countries the deployment of ITS is already at a saturated stage. Attention in these countries is currently focussing more and more on deployment of next generation technology (e.g. C-ITS). In comparison, the Cohesion countries (Poland, Baltic States) today have a relatively low level of ITS implementation and are pushing strongly to catch up. In the East – West Corridor, both strands come together, which provides a particular challenge to the East – West Corridor, but also an opportunity to consider interoperability and migration right from the start.

The isolated regional development in the past provides not only a technical challenge, it is also an organisational challenge since the personal 'network' required to establish a road operator community, which can then be taken as a starting point to team up, form a common corridor work program and discuss harmonisation aspects, has just been started to establish. Besides the fact that cooperation and harmonisation are not established yet, this also means that the important synergy effects of cooperation, in particular sharing best practice, have not been exploited so far. This is certainly an indisputable asset of the East – West Corridor.

4.1. A Vision for the East West Corridor

Clearly there has been considerable investment in ITS systems and services to date along certain stretches of the East – West Corridor mainly focussed on the western reaches of the corridor concentrated in North West Europe. These have followed European, national and regional policy requirements in the context of Euro regions, rather than a corridor concept.

Considering how ITS should be deployed in the context of a long-distance East – West corridor, adoption of common vision which stakeholders work towards delivering in the short, medium and longer term is useful. Having a vision helps in shaping the future development of the corridor whilst at the same time enabling measurement of progress and anticipated benefits.

Taking account of the reports written for each of the CEF Corridors, the "Issues Papers", and the issues, challenges and benefits that have arisen from the 5 established ITS corridors such as Arc Atlantique and URSA MAJOR, a vision for the East – West Corridor would include the following key elements. Given the cross-border nature of a corridor, the vision must include institutional arrangements as well as technical cooperation.

4.1.1. FROM THE ROAD USER PERSPECTIVE

From the road user perspective of commercial, freight and private vehicles who expect fast, reliable, efficient, safe and comfortable journeys:

1. Availability of traffic information services on and for the immediate vicinity of the network and for an appropriate distance to the destination.
2. Availability of traffic management services to maximise the safety and efficiency of travel and maximise journey time reliability.
3. Provision of support services for the freight industry such as truck parking information and Intelligent Truck Parking services.
4. A common look and feel to the service provision, consistency of the provision in terms of geographical location and quality of service and which are harmonised along the corridor route.

4.1.2. FROM THE ROAD OPERATOR PERSPECTIVE

From the road operator's perspective the vision would include delivering and operating a fast, reliable efficient, safe and comfortable road service that is cost efficient using:

1. Established cooperation between adjacent road operators, both inter and intra States along the corridor route, and between road operators and key stakeholders such as ports.
2. Complementary operational and organisational arrangements, including Traffic Management Plan(s) that extend across borders, between transport hubs and other modes that operate in the context of the corridor route.
3. An investment plan that is created by stakeholders in the corridor which governs future investment in ITS systems and services and supports the need to implement, develop and maintain an efficient corridor. This would be outlined within a Road Map for the corridor that sets direction and milestones for wider deployment of ITS systems and services along the corridor.
4. At a day to day operational level, established cooperation between road operators and owner/operators of key transport hubs, particularly key ports, for instance Zeebrugge, Dover and Tallinn.
5. Real time and historic data exchange between Road Authorities, transport operators and stakeholders along the corridor network.

4.1.3. FROM THE PERSPECTIVE OF THE ITS SUPPLY CHAIN

From the perspective of the ITS supply chain, the vision would be an enabler and include:

1. Provision and access to traffic and travel data via National Access Points which enable ITS services to be developed and provided.
2. Opportunity to offer ITS systems and services to road and transport operators using specifications that include cross border and long-distance corridor user requirements.
3. Visibility of future opportunities to provide systems and services based on a Road Map for the Corridor.

4.1.4. FROM THE PERSPECTIVE OF THE MEMBER STATE AND REGIONAL GOVERNMENT

From the perspective of a Member State or Regional Government the vision would include delivery and operation of an efficient, safe and comfortable road service that is cost efficient, in partnership and in cooperation with adjacent Member States and regional government, bound together by:

1. A statement of intent to cooperate to achieve a common goal for the corridor, driven by user and operator needs which meet national as well as international perspectives.
2. A Road Map that communicates the intentions for the ongoing development and operation of the corridor.

4.1.5. FROM THE PERSPECTIVE OF THE EUROPEAN UNION

From the perspective of the European Union:

1. A cross border transport corridor that functions as a seamless corridor, comprising a series of national and regional entities working in partnership.
2. A corridor implementing ITS that contributes to EU policy to improve efficiency, safety, reduce environmental impact and help mitigate climate change on the Core Network Corridors.
3. A real or virtual entity that provides the basis for targeted investment that takes account of the trans-national factors impacting long distance freight, commercial and private road users and multi modal transport.

To achieve this vision, establishing and strengthening cooperation of road operators and key stakeholders in an East – West corridor, who agree to a road map for improving the corridor by deploying harmonised and seamless ITS services, will be essential.

4.2. The expected benefits of establishing an East West Corridor

Harmonised deployment of Intelligent Transport Systems (ITS) on Europe's trunk road network, including the Trans-European Network for Transport (TEN-T) and its core network and corridors, has proven benefits of cost-effective solutions for mobility, safety and the environment.

To make a corridor function as such it requires a close cooperation of the relevant Member States and road operators. The East – West Corridor established to date under the EU EIP is doing just that: benefiting from bringing together relevant Member States and road operators along the East – West Corridor, which is essential for realising seamless and harmonised ITS services.

Core Network Corridors are one important pillar of today's European transport policy that addresses all modes of transport. ITS deployment has recently been included in this concept with ITS Deployment Corridors covering most of the Core Network Corridors, but

addressing the specific nature of road traffic and transport. Many ITS for roads benefits are actually based on rerouting traffic or combining link oriented services on different links in a meshed network. The East – West Corridor will facilitate Cross Border Management and Information to enable more effective long-distance planning and rerouting where appropriate.

Given the prominence of long distance freight on the East – West Corridor, the corridor would certainly have to be freight centric and needs to address the special maritime situation of transport entering or leaving across the Baltic Sea, the North Sea and the Irish sea. Thus, the East – West Corridor brings potential benefits of linking road traffic to other modes of transport, in particular maritime transport.

Furthermore, the feasibility study indicated that coordinated ITS deployment on the East – West Corridor will bring benefits of harmonisation of services that address the specific characteristics of the East – West Corridor, in particular with respect to long distance freight traffic. Typical examples of such harmonised services could be Traffic Management Plans (including ferries), truck parking and ITS vs. C-ITS.

The study also established that useful combinations of scenarios could be found and mapped against different operating environments that allow for planning harmonised ITS deployment. Since many Member States plan similar ITS services, benefits will arise from the exchange of best practices and experiences between those engaged in the East – West Corridor. Free access to all the practical experience of the European Road operators in the European ITS Platform, EU EIP would be available to consolidate this activity.

The countries in Eastern part of the Union have started to implement 'traditional' ITS systems and services, whereas the Western-European countries have done so for the past decades and now have started to implement C-ITS services in various C-ITS corridor projects. This has the benefit of bringing traditional ITS and C-ITS together, with an opportunity to consider interoperability and migration right from the start.

The East – West Corridor is characterised by central areas of the corridor implementing advanced ITS systems with high levels of service, and Western and North-East stretches commencing with new deployments and entry level services. The benefits of an over-arching governance arrangement facilitating transfer of knowledge and cooperation in planning for new ITS services, will enable certain partners to deploy harmonised ITS more rapidly and potentially step into more advanced systems using best practice shared between partners. Furthermore, the East – West Corridor will be able to converge ITS road maps created under domain activities such as the ITS Road Map and the C – Road ITS road map. The East – West Corridor will be a be a demonstrator of how partners can work together to achieve a common goal.

The East – West Corridor intermodal route planner is a good example of a tool that could promote the use of intermodal transport on the East – West Corridor. The corridor is therefore already benefiting from a tool that is designed to promote multimodal transport which is considered as one of the priority topics of the EC, as was highlighted in the issue paper on multimodal transport.

5. An ITS Road Map for an Operational East – West Corridor across Northern Europe

The purpose of a road map is to define a set of guidelines, instructions or plans to achieve a desirable outcome. In the context of project management a road map can be a graphical, high level overview of a project's goals and deliverables presented in the form of a timeline. The latter is being used for this report.

The ITS road map for an operational East – West Corridor across northern Europe set out on the following page is aimed at road operators who manage, maintain and invest in highways infrastructure and ITS services. It is also designed to inform DG Move and INEA on a possible timeline to focus strategic investment through facilitating cross border cooperation at an institutional and operational level. In the present context, this would be via the Connecting Europe Facility or other funding instruments.

In previous sections of this report it is highlighted that the characteristics of this corridor comprises significant sea 'barriers' – the Irish, North Sea and Baltic, a highly congested 'central' section of the corridor network, and relatively uncongested far stretches in the West towards Ireland and East towards the Baltic States in the North-East of Europe. Furthermore, the East – West Corridor is characterised by high freight volumes.

This suggests that supporting and facilitating multi-modal transport will be particularly effective on this corridor, and the piloting of the multi modal route planner as part of this Activity has proved a useful tool for future use.

In the context of work under this Activity the ITS services are broadly classified under the headings of:

- **SFE** – Safety and flow enhancement
    - Dynamic lane management (DLM)
    - Speed Limit Information + Variable Speed Limit (SLI+VSL)
    - Hard Shoulder Running (HSR)
    - HGV overtaking ban (HOB)
    - Ramp metering (RAM)
    - Roadwork and Hazard Warning (RHW)
- **FS** – Freight support

- Static Truck Parking Information including Security (STP)
- Dynamic Truck Parking Information (DTP)
- Truck Parking Optimisation (TPO)

- **TMP** – Traffic management plan
  - National (Single- or Multi-operator S-TMP, M-TMP)
  - Cross-border (C-TMP)
  - International (I-TMP)

The definition of these are included in the report *East – West Corridor Feasibility Study* which preceded this document and is informing this road map report.

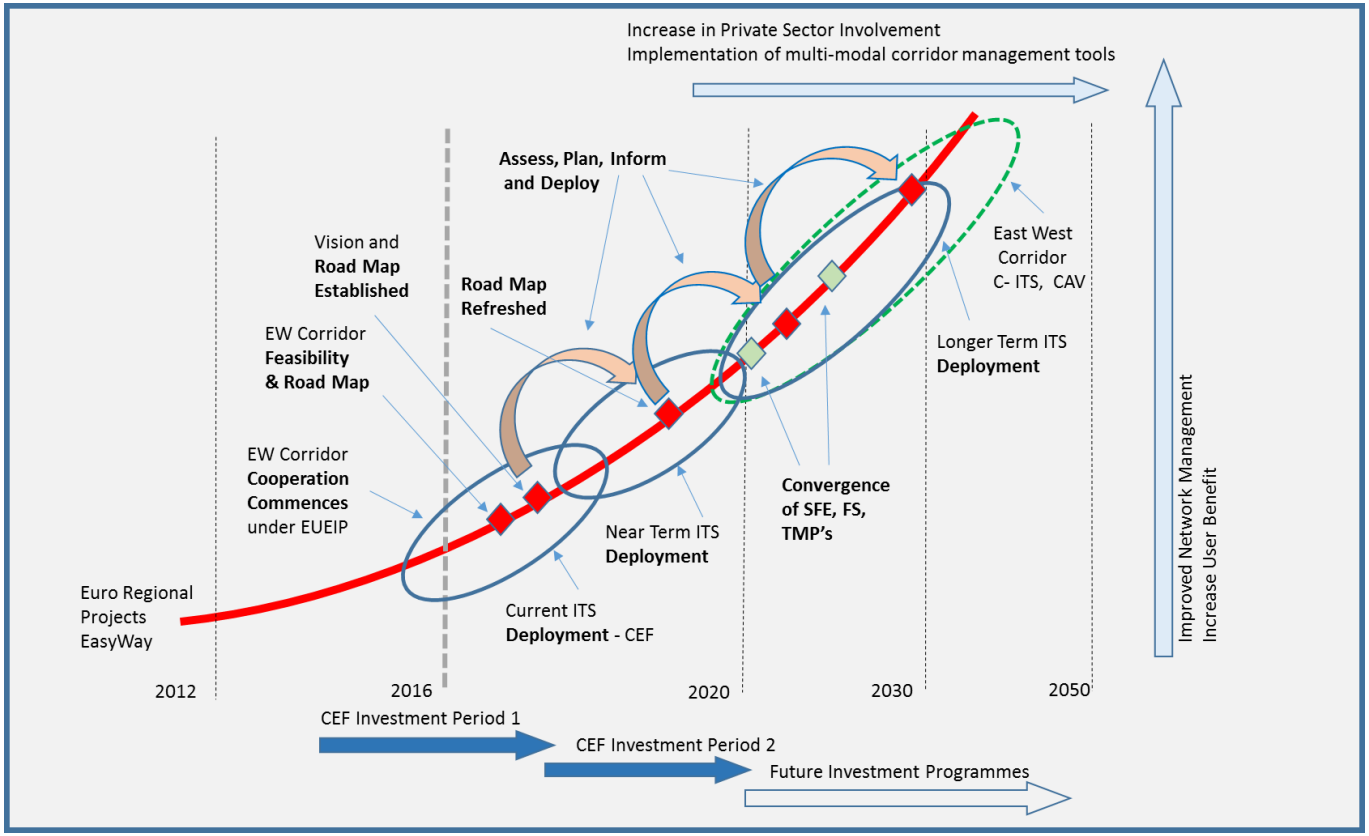

Figure 4: Road Map for East – West ITS Corridor

5.1. Road Map Features

The road map presented on the previous page is a graphical high-level overview in the form of an illustrative timeline towards meeting a vision for harmonised, seamless ITS services along the East – West Corridor. The road map features some key themes.

5.1.1. Improved Network Management and User Benefit

Given the body of proven knowledge concerning the expected benefits arising from the provision of ITS services in its widest sense, we expect that a key feature of the road map will be improvements in the road operator's ability to manage the road network more effectively. This will in turn deliver wider benefits to traffic managers and road users of increased efficiency and better reliability.

5.1.2. Increased involvement of the private sector

The current trajectory of involvement of the private sector in traffic information and traffic management systems is set to increase. This is fuelled by the increasing availability of data, made available through National Access Points or via other public and private sector entities, from which new business opportunities emerge as well as new ways to deliver traffic management services.

5.1.3. Sustained investment

A feature of the road map is the need to continue with targeted investment along the corridor network. Up until 2012 investment in ITS was supported through the EasyWay programme but in the context of regions rather than corridors. Since 2012, investment via the Connecting Europe Facility has occurred on the Core Network in the form of ITS corridors such as the Arc Atlantique, URSA MAJOR and Next - ITS. These ITS corridors have followed a largely north - south trajectory. These projects are now in their second phase. These sustained levels of investment over a number of years have been evaluated and benefits arising from wider roll out of harmonised ITS services have been documented. These projects are now entering a third phase of investment meaning expected benefits are set to widen.

Similarly, with the East – West corridor, ongoing investment will enable a strategic approach to be taken such that the targeted vision is achieved. Indeed it is possible to see that investment in elements of the East – West corridor has already begun during the initial CEF investment period and this has continued in the period 2015 – 2018 at strategic points along the East – West corridor route, but in the context of the Arc Atlantique and

URSA MAJOR ITS corridors. Clearly the East – West Corridor network has benefited from this work albeit 'on behalf of' existing ITS corridors. However they have not been implemented in the context of an East – West strategy.

5.1.4. Sustained cooperation between stakeholders & convergence of Existing Road Maps

The launch of the multimodal CEF core network corridors and in particular the success of the ITS Deployment Corridors have benefited from increasing cooperation between key actors responsible for the road network within each Member State. The EasyWay programme and more latterly the previous and current phases of the EU ITS Platform (EU EIP) have horizontal activities specifically targeted at best practice, knowledge exchange, cross corridor cooperation and evaluation of the benefits arising from the ITS corridors.

The ITS Platform includes key actors from each of the road authorities who understand the issues and challenges of delivering efficient ITS services to users. Cooperation between key stakeholders under the EU EIP has led to the identification of need for an East – West corridor. Accordingly, cooperation has already commenced leading to the proposed road map described in this report.

The road map indicates the need to strengthen cooperation between stakeholders in the corridor on an ongoing basis. It is understood that Partners in the EU EIP and key actors in the adjacent ITS Deployment Corridors have indicated their willingness to increase cooperation through broadening cross corridor cooperation and liaison in their respective responses to the 2016 CEF ITS Call.

An outcome of this process will be convergence of other ITS road maps that deal with common ITS themes. These would include for instance, the ITS Road Map and the C-Road road map for C-ITS Services.

5.1.5. Accelerating Deployment of ITS Services

As described above, deployment of ITS services has already commenced on the East – West corridor albeit under the umbrella of the Arc Atlantique, URSA MAJOR and Next-ITS ITS Corridor projects. The road map indicates the need to plan and deploy in the short and medium term in the context of an East – West Strategy.

Work undertaken in the Feasibility Study stage of this Activity documents where there are plans to implement ITS Services on the East – West Corridor under the umbrella of

existing ITS corridors to 2016. The cooperation between the partners in this Activity has allowed an indicative work plan to be created for the near to mid - term from 2017 - 2019.

This is given in the table below.

EAST WEST CORRIDOR -Member States	Aggregated ITS Services	Operational ITS services (2016)	ITS deployment plans (2017-2019)
The Netherlands	**SFE**	SLI+VSL, HOB	DLM, SLI+VSL (IVS) using C-ITS
	FS	STP, RHW	RHW using C-ITS
	TMP	Single-operator	S-TMP
Belgium[4] (Wallonia)	**SFE**	SLI+VSL, HOB, RHW	RHW
	FS	STP, DTP	-
	TMP	-	-
Germany	**SFE**	DLM, SLI+VSL, HOB, HSR, RM, RHW	DLM, SLI+VSL, HOB, HSR, RM, RHW
	FS	STP, DTP	STP, DTP
	TMP	Single-operator	Single-operator
Poland	**SFE**	SLI+VSL, RHW	SLI+VSL, RAM, DLM, RHW
	FS	-	-
	TMP	S-TMP	S-TMP
Estonia	**SFE**	-	DLM, SLI+VSL, RHW
	FS	STP	TPO
	TMP	-	C-TMP
Finland	**SFE**	SLI+VSL, RHW	DLM, DTP
	FS	-	-
	TMP	Single-operator	Single- and Multi-operator
The UK	**SFE**	SLI+VSL, RAM, HSR	SLI+VSL, RAM, HSR, RHW
	FS	-	STP
	TMP	S-TMP	S-TMP
Ireland	**SFE**	-	SLI+VSL, HSR
	FS	-	-
	TMP	S-TMP	S-TMP

[4] Information are collected directly from the EWmap tool

5.1.6. CREATION OF CROSS BORDER TMP'S

Traffic Management Plans that extend across and beyond regional and national borders are the gold standard in long distance corridor management and improvement of ITS services to road users. Creation of Traffic Management Plans to address common problems of efficiency, reliability of journeys and safety at specific locations on the corridor network can be promoted and implemented as stakeholders in the East – West Corridor implement the road map and work to towards achieving the vision. Traffic Management Plans involving other modes such as ferries and rail will become more important as will incorporation of ports and transport hubs into local and trans-national Traffic Management Plans.

5.1.7. C-ITS SERVICES

Piloting of C-ITS services are commencing in Western sections of the East – West Corridor during 2017. Planning for deployment of full Day 1 and 1.5 services is taking place and it is expected that these new services will be deployed from 2019 onwards on a wider scale. C-ITS services are an important emerging tool for management of traffic and safety with associated environmental mitigation. Wide coverage of C-ITS services can be expected, including more advanced ones of V2V and V2I. Once mainstream they will be able to allow for new concepts of Traffic Management and the use of infrastructure, further enhancing the performance of the corridor in a cost effective way.

5.1.8. ASSESS, INFORM, PLAN AND DEPLOY

The need to revisit and review deployment plans on a cyclical basis is important to test progress against the road map, adjust the vision if necessary and adapt plans for future deployment of ITS Services. Evaluation of the impact of the deployed harmonised services is important to be able to understand whether benefits are achieved and whether the project remains consistent with policy objectives and technical development. Furthermore, that the vision and road map remains responsive and relevant to potential changing characteristics of the corridor and new technologies or services are incorporated when they can deliver real benefit to the road user. An example of the latter would be planning for the introduction of C-ITS services when these are mature.

5.1.9. CONCLUSION

The road map provides a useful visual tool to illustrate a potential road map for the East - West Corridor. Two key features of the road map are the need to have active coordination between road authorities and road operators along the corridor network, have sustained and targeted investment in harmonised ITS and to review the plans for the corridor on a cyclical basis.

6. Realisation of the Road Map

6.1. Timeline to deployment

In section 5 the road map was presented graphically as a high-level overview. In the following table the ITS services and key themes of the road map are brought together in one overview, including indicative timing of the deployment.

A difference can be seen between the near term and longer term actions. Most of the near term deployments can be done at MS level, whereas for the longer term deployment more effort should be put in coordination, e.g. information exchange between road operators, harmonisation between countries, cooperation with other stakeholders, etc.

Furthermore it can be noticed that the near term deployments are often directed towards filling gaps, thus creating an East West Corridor where at least the most critical spots (from a safety and/or traffic flow perspective) are covered by ITS services. The longer term deployments are targeting higher level objectives, such as harmonised service levels, full C-ITS services, long distance and multimodal TMPs, etc.

Last but not least the difference in deployment level between countries in the East and in the West should be mentioned, leading to more short term deployments aimed at filing gaps in the East and e.g. early C-ITS deployment in the West.

(C-)ITS services	Near term (until 2020)	Longer Term (2020 onwards)	Comment
Road Works & Hazard Warning	• Critical spots • Fill gaps • Early C-ITS implementation.	• Harmonised service level • Data available via NAP • C-ITS services	
TMPs	• TMPs at critical spots on the network* • Cross border TMP	• Long distance TMP • Multimodal TMP's	*likely to be in the East as well as at busy points in the West
Intermodal Freight hubs	• Timed parking at a distance	• Multimodal TMPs	

	• Information on available spaces • Timeslots at terminals • Information available via NAP • Intermodal information (ferry/rail)		
Safety and Flow Enhancement	• Implementation of HSR, DLM, SLI+VSL, etc. (resolving bottlenecks filling gaps) • Data available via NAP	• Data available via NAP with enhanced services • Higher levels of services and data quality. • C-ITS services	Officially all MS should have established a NAP for SRTI already in 2015. However, this objective has not yet been achieved in all MS. For RTTI the NAPs must be established in 2017.
Truck Parking	• Static truck parking data available via NAP, including non TERN sections (e.g. hubs and urban)	• Dynamic Truck Parking data available via NAP • Intelligent Truck Parking	Officially all MS should have established a NAP for truck parking already in 2015. However, this objective has not yet been achieved in all MS.
C-ITS	• Day 1 / 1.5 early implementations	• C-ITS full roll out	

6.2. Funding/cooperation instruments

In order to realise the deployment of ITS in the short and longer term, a number of instruments (financial, cooperation) are available:

- The CEF corridor project North Sea – Baltic is planning to initiate a so-called ITS flagship project. The aim of this project is to optimize the use of the physical infrastructure, which is being extended during the lifetime of the CEF corridor project. Since the East – West Corridor largely coincides with the North Sea- Baltic corridor, there will be a good potential for synergy between both initiatives.
- Another issue-paper in relation to the CEF corridor projects covers multimodality. Although it is not yet clear which corridor project will launch a multimodal flagship project, it is certainly worth to follow this discussion and look for synergies. Given the emphasis on freight in the East – West Corridor, this is very relevant.
- Near term plans for harmonised ITS services located on the East – West Corridor have been included in the 2016 applications for funding by the Arc Atlantique, URSA MAJOR and Next – ITS. All three projects included a cross-corridor coordination activity in relation to the East – West Corridor. Thus, the profile of the East – West Corridor within Arc Atlantique, URSA MAJOR and Next-ITS, in the form of a virtual corridor, has been strengthened. This will be a good basis for a cooperative approach towards ITS implementation between Member States and between the East – West Corridor and the more north-south running ITS corridor projects URSA MAJOR, Arc Atlantique and Next-ITS.
- A number of funding instruments can potentially be targeted, although each programme has its own objectives, characteristics and rules:
    - Interreg has three relevant sub-programmes that could be addressed, however, each with its own geographic restrictions:
        - Baltic Sea Region, covering all countries around the Baltic Sea (except Russia).
        - North Sea Region, including the coastal regions of Norway, Sweden, Denmark, Germany, Netherlands, Belgium and UK
        - North West Europe, covering UK, Netherlands, Belgium, Luxembourg, northern France and Western Germany

      ITS deployment is not a specific topic within these programmes, but one could possibly find the right 'hook' to link the ITS deployment to the global and specific objectives of these programmes.

- Cohesion Funds: The Cohesion Fund is aimed at Member States whose Gross National Income (GNI) per inhabitant is less than 90 % of the EU average. It aims to reduce economic and social disparities and to promote sustainable development. For the East – West Corridor this applies to Estonia, Latvia, Lithuania and Poland. The Cohesion Fund will support infrastructure projects under the Connecting Europe Facility.

- CEF ITS Calls (potentially 2018/19): It is expected that in 2018 or 2019 a final ITS call will be launched within the CEF programme. This could offer good opportunities for funding of ITS deployment on the East – West Corridor.

Of course Member State Funding is always a possibility, although this strongly depends on the priorities and funding programmes available per country.

7. Recommendations

7.1. Recommendations for Implementing the Road Map

The vision for the East – West ITS Corridor can be achieved if a road map is adopted by the partners and key stakeholders in the corridor. Accordingly, the following steps are recommended:

Common Purpose, Governance and Investment

- Road authorities and operators along the corridor route recognise that the network is characterised by long distance freight traffic with significant challenges such as sea crossings and heavily congested sections of the network
- Road authorities, operators and private organisations are politically and financially supported to target investment in problem areas with harmonized ITS services that benefit users of the corridor.
- Partners in the East West Corridor establish an over-arching governance arrangement that takes account of segments of local character, where strategic and tactical interventions can be achieved with local and corridor level benefits.
- Support is targeted to the far West and far North-East sections of the corridor where the prevalence of ITS is limited.

Mutually Beneficial Cooperation and Partnering

- Road Authorities and operators acknowledge that through adopting a strategic approach to meeting the challenges on the corridor network, and by complementing each other's activities in the spirit of mutual cooperation will ultimately benefit the road user.
- The current cooperation achieved via the EU EIP and existing ITS Corridors is further strengthened through extending public and private engagement and personal relationships achieved to date under the CEF programme.
- Engagement is widened to include the Multimodal CEF Corridor North Sea - Mediterranean and North Sea - Baltic, to establish a common framework for development of the corridor.

Technical Cooperation

- Road operators establish cooperation on a day to day basis both at a technical and institutional level through agreed cross border traffic management plans and

traffic management plans involving ports and transport hubs, and other relevant measures.

- Exchange of best practice is encouraged and accelerated, particularly between operators of Level 4 ITS services and those with Level 0 or 1 as defined by the EasyWay ITS Guidelines.
- Data acquisition and the availability of data through National Access Points is encouraged to facilitate creation of new ITS services including multimodal services for freight, commercial and private road users.

7.2. Wider Recommendations that Support the East – West Corridor

On a wider level to the specific recommendations for the road map:

- Should the 2016 CEF Call applications prove successful for funding, the conclusion reached at the time not to launch an East – West corridor as a separately funded corridor should be revisited. This is with a view to confirming the best future management arrangements. This is either to increase the profile of the East – West Corridor within Arc Atlantique, URSA MAJOR and Next-ITS, in the form of a virtual corridor, possibly completed by a new ITS corridor covering the Baltic States and Poland, or prepare to create a separate entity in future CEF Calls covering the whole area of the East West corridor. The EU EIP A2 Monitoring and Dissemination ITS Deployment group would be a suitable forum for this conversation.
- Extend the scope of the cooperation to include States on the corridor network that have not yet been involved in this project but are key to cohesiveness and future deployment of seamless, continuous and harmonised services. Furthermore to extend inclusion of key ports and transport hubs.
- Work with East – West Corridor authorities and operators to confirm and / or adapt the vision for the corridor and add further detail to the road map.
- Undertake further study into the medium and longer term plans required to deliver an efficient corridor including the benefits arising from facilitating greater multimodality.
- Support the North Sea – Baltic CEF corridor and potentially other CEF corridors in establishing a flagship project that demonstrates benefits from wider deployment of harmonised ITS services.

- Develop the multimodal theme launched in this project to further identify how multimodality can enhance the performance of the corridor. This would include an extension to the scope of the inter modal route planner.

8. Conclusions

Activity A3 of EU EIP studied the need for, and potential of, an East West ITS corridor stretching from Ireland and UK, via The Netherlands, Germany to Poland, the Baltic States and finally Helsinki.
Several factors had led to the assumption that cooperation along an East West corridor would be relevant and possible, viz.

- since the extension of the Union in 2004 traffic and more so transport had increased substantially,
- cooperation between the sectors of such a corridor was absent or not well developed
- existing CEF core network corridors and ITS corridors are mostly oriented north – south.

To explore the potential and actually make a start with cooperation 3 activities were executed:

1. Establishing a cooperating community of road authorities along the corridor.
2. A feasibility study based on the implementation plans for ITS.
3. This road map.

Additionally a pilot for a multimodal route planner has been undertaken as a supporting sub activity; the premise being that a tool of this type could provide a service that could ease the issue of congestion and barriers to East - West flow of traffic along the East – West Corridor route as well as help promote the multimodal use of the corridor. The route planner and its evaluation have been reported separately.

The conclusions are:

The first report (1.1), Initial findings on the currently deployed ITS and immediate plans for deployment, produced a first overview of ITS status and plans in the Member States and was in time to provide input for proposals in the CEF 2015 call

The second report (1.2), *East - West Corridor Feasibility Study,* discussed the merits of an East - West ITS Corridor, identified its characteristics, reviewed the current status of deployment of ITS and near to mid-term plans for deployment. It concluded that ITS services, categorised under Safety and Flow, Freight Support and Traffic Management Plans, could be used to impact traffic and transport issues along the corridor, enhance its performance and coherence and gave examples of where this has been achieved.

This report (1.3), *ITS Road Map for an Operational East – West Corridor across Northern Europe,* has concluded that the traffic and transport challenges arising from the particular characteristics of the corridor network, can be addressed through widening deployment of harmonised ITS services using a structured approach set against an agreed vision and road map. Furthermore, certain steps are required to ensure that an operational East – West corridor is achieved.

During the process a cooperating community of road authorities and road operators was built, bringing together those who work in the upper half of the North Sea – Mediterranean area and those of the North Sea – Baltic corridor area. Also a bridge was made between those who are relatively new in using ITS and those who have done that for decades. It also turned out that when optimally addressing transport, hubs should be included. In the East West Corridor area with 3 seas, ports are of particular importance and integrating information from e.g. ferry services, and cooperation for integral planning are relevant, as is already undertaken by some partners.

Based on existing systems and existing plans from the partners Intelligent Transport Services were identified where harmonization, cross border cooperation or long-distance services are relevant and possible. Together with other roadmaps and a vision for a longer term, a possible roadmap for the East West corridor has been proposed. A governance structure has been described, where, while actual deployments are usually performed at the national level, harmonization and cooperation can be guided by a central overview, which till 2020 can be provided by an extension of the East West corridor activity in EU EIP.

Appendix A: List of Acronyms

The following acronyms have been introduced by this study and used throughout the document to describe individual ITS services or aggregation categories of services.

CBM	Cross Border Management
DLM	Dynamic lane management
DTP	Dynamic Truck Parking Information
FS	Freight support
HOB	HGV overtaking ban
HSR	Hard Shoulder Running
RAM	Ramp metering
RHW	Roadwork and Hazard Warning
SFE	Safety and flow enhancement
SLI+VSL	Speed Limit Information + Variable Speed Limits
STP	Static Truck Parking Information including Security
TMP	Traffic management plan
TPO	Truck Parking Optimisation