Contents

[EnTM - ANNEX II - The Strategic approach 2](#_Toc492486906)

[I.I Building a common vision 2](#_Toc492486907)

[I.II Unlocking Cooperation 3](#_Toc492486908)

[I.II.I The changing Roles 3](#_Toc492486909)

[I.II.II Smart Governance 4](#_Toc492486910)

[I.II.III The orchestration of Services 5](#_Toc492486911)

[I.II.IV Data into Action 6](#_Toc492486912)

[I.III Consolidated Strategic Approach 8](#_Toc492486913)

[I.IV Initiatives and Supporting Actions 11](#_Toc492486914)

[I.V From Strategy to Project pipeline 14](#_Toc492486915)

# EnTM - ANNEX II - The Strategic approach

The Balanced Scorecard[[1]](#footnote-1) is typically designed for Organizations, focused on managing the implementation of a strategy or operational activities, based on their long term vision and mission.

The methodology proposes to assess the organization under 4 different perspectives. While aiming for improving financial performance and meet the targeted user/customer's needs, the organization defines the strategic lines to take , its objectives, initiatives and actions to try achieving those goals.

Under the current context, choosing to carry out a simplified Balanced Scorecard approach provided, the WG members, the right mind-set to foster Cooperation, as they were asked to think as if they belonged to an 'Organization' (or a community). By doing so, it was easier to evaluate how each individual stakeholder's contribution could help the organization reach its overall objectives.

The introduction of Cooperative, connected and automated systems into the mobility system, was used to challenge the stakeholders' status quo, and to force them out of their comfort zone, into new formulas of compromise and collaboration.

During the discussions, balancing different needs was always present, helping to frame the Organization's strategic vision and its objectives.

Public | Private

Individual user | Collective User

Advice traffic | Command traffic

Improve Corridor performance | Improve Network performance

Data Exchange | Data Transaction

Free of Charge | B2B Services

## I.I Building a common vision

After the discussion the WG reached a common vision:

## I.II Unlocking Cooperation

It was commonly agreed amongst all the stakeholders that higher benefits will come from cooperative connected and automated systems, particularly from the cooperative component when addressing traffic flow efficiency.

Therefore there is a strong will to cooperate.

But, cooperation is not easily established, especially between (or amongst) groups of stakeholders that may have conflicting business interests.

In order to promote cooperation, the Working Group focused on finding the benefits across *win-win situations,* taking into account the governance and operational aspects.

### I.II.I The changing Roles

By offering navigation and routing advices, OEM's and Service providers are increasingly becoming more influential on how traffic is managed. However with cooperative, connected and automated systems, it is clear that this movement will require some alignment with the public sector.

Combining:

* data collected from the increasing communities of registered navigation systems users, together with;
* data collected from ITS road equipped infrastructures, operated by public authorities (member States, cities, road operators and traffic managers),

can improve the resilience of the navigation services and, ultimately, lead to the development of enriched forecasting capabilities.

Today Service Providers' crowdsourced fusion engines are still only 'reactive' to incidents (accidents, closed road, e.g.). The incident only becomes a part of the operational picture, once it is detected, collected and validated. Incidents, however, can be unforeseeable or planned. 'Proactive' services require crowdsourced data, to come together with information about planned events.

It is the public sector that holds that information and the investment road map to develop it.

The added value of collaboration is clear. From the *road's* perspective, Traffic Managers can expect a higher compliance with the traffic measures they issue, as connected and automated vehicles will certainly follow them. From the *vehicle's* perspective, manufactures and service providers aim to achieve a better understanding of those traffic measures, in order to promote improved and more resilient mobility services.

The win-win trade-off, for improving traffic flow efficiency while balancing the individual user needs with the collective's best interest, is a matter of negotiation on how much are Public Authorities and the Private sector willing to share the responsibility of managing traffic.

### I.II.II Smart Governance

The group recognised the, public and private, different perceptions of the cooperative benefits.

While for the private sector, developing added-value services may correspond to commercial well-defined business models, the public sector assesses the added-value into the overall improvement of road safety and flow efficiency, by reducing emissions, lost hours and the number of accidents or fatalities.

Therefore, *Cooperative Traffic Management Services* need to be developed under a clear governance framework, in order for Public authorities to preserve their role, without compromising the commercial competitive advantages of Services Providers/OEM's.

The split, between the governance and the management levels, is important to establish, for the definition of the mobility policy precedes the operational implementation.

In order to cope with more complex and also flexible scenarios, Traffic Management is expected to take up more decentralized or distributed governance models.

Establishing *Cooperative Traffic Management Services*, in which different actors are allowed to take decisions and actions in a decentralized although well-orchestrated way, needs a 'smart governance' framework. These means the public and private actors need:

* To come to an agreement on the actions to put in place;
* To perform those actions, accordingly, and work together.
* To understand each other's role along the service value chain;

The group agreed with three Strategic Lines to take:

Establishing operational cooperation between the different actors can be framed under performance contracts or service levels agreements, e.g. and foster the development of decentralized cooperative incident management services and applications.

These decentralized applications, supported by adequate V2V and V2I communications that, when facing an incident, can take action locally, without the need of intervention of the Traffic Manager, improve safety and flow efficiency.

Some examples of these decentralized applications were discussed within the group:

* Cross Brand Cooperative Lane changing.
* Cross Brand Cooperative Lane merging.
* Cross Brand Cooperative Ramp metering.
* Standardize On-street Parking data, facilitating parking at the end of a journey and promoting modal shift.
* Standardize Traffic lights data at intersections for smooth driving combined with new priority schemes for Public transport or emergency vehicles.
* Cooperative Intersection Crossing.

'Smart Governance' is to be understood as the common agreements, set between the several actors, allowing them to take action by exchange/transaction of *traffic management related data*, without compromising the service's value proposition.

The group concluded that different services may result from actions taken by different combinations of actors. Therefore, Cooperative Traffic management should be understood as a *multi-dimension value chain of services*.

### I.II.III The orchestration of Services

The group agreed that, under every possible combination of cooperating actors, there was a need for coordination. The, so called, orchestration of services shall be defined at governance level, allowing the several stakeholders to perform collaboratively.

Borrowing the *games theory*[[2]](#footnote-2)[[3]](#footnote-3) approach and the concept of *coopetition*[[4]](#footnote-4) the group addressed some ideas to help understand how, the future business cases, could be shaped when moving into developing *Cooperative Traffic Management services* across multiple value chains.

From the discussions, the group came to some conclusions:

1. Real-time traffic information services shall be provided by the market, either by public bodies or private organizations, as an advice or recommendation;
2. Only the public sector holds the authority to issue mandatory traffic measures;
3. To help Public authorities play the role of the *'orchestra conductor'* their mobility plans need to become a 'standardized inter-exchangeable data', in order for cooperative and automated systems to be able to comply with.
4. Orchestration of services shall attend different contexts and needs, across urban, interurban and rural areas.
5. Establishing common implementations, between public and private stakeholders, can scale up the market, avoid fragmentation and contribute to speed up the uptake of the benefits of connected and automated vehicles into traffic management.
6. Coopetition was pointed out as a way forward to address the need and to develop the required new standards for *Cooperative Traffic Management Services.*

### I.II.IV Data into Action

*Traffic management related data* is the foundation for the orchestration of *Cooperative Traffic Management Services*.

It is important to understand that the same stakeholder, public or private, can act as a producer of data as well as a consumer of data, embodying different roles along the multiple value chains of *Cooperative Traffic Management Services*.

Therefore, several requirements for the exchange/transaction of *Traffic Management related data* were discussed and identified by the group.

*Traffic Management related data* shall:

* Meet the requirements of the Legal Framework (regarding Security, Privacy, ownership, Liability, Quality, Compliance, Licensing, Certification, e.g.);
* Take into account the existing ITS Standards (*DATEX, TPEG, CAM/DENM* and *RDS/TM*C, e.g. and non-exhaustive);
* Take into account the EU ITS Policy Instruments, the ITS Directive and Delegated Regulations (current and future-C-ITS);
* Allow any combination of actors to communicate, collaborate and perform together;
* Ensure the service's value proposition, across the *multi-dimension value chains* of *Cooperative Traffic Management Services*, from 'start to end';
* Ensure interoperability with new communication media and data sources;
* Ensure dissemination through different communication channels;

Turning *Data into Action* led the group to consider the *Internet of Things (IoT)* approach, for layering data | information | knowledge | action, as proposed in Figure 8.

Balancing the different needs between Private|Public - Individual|Collective - Command|Advice, provide support to build up the Knowledge and Information layers.

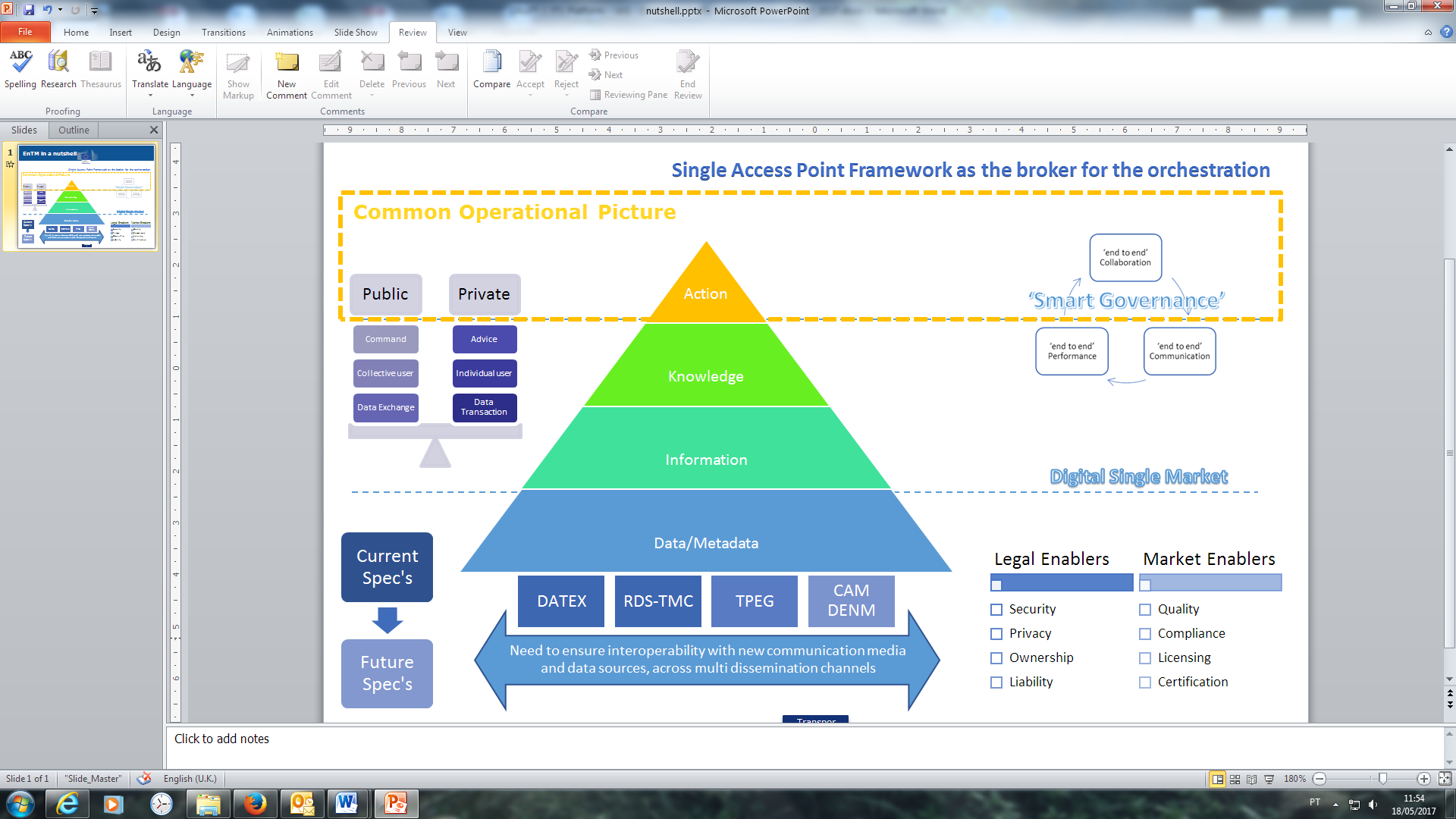


Figure 8 – Data into Action for Cooperative Traffic Management Services.

As expected, the Common Operational Picture is established at the level of *action*, where the orchestration of *Cooperative Traffic management Services* is put in place, by public and private actors, required to come together and implement pre-established agreements (digital TMPs or TCPs, e.g.).

The group agreed the National Access Points could take up the role of an information broker, or service broker, for enabling *Cooperative Traffic Management Services*.

## I.III Consolidated Strategic Approach

The Balanced Scorecard methodology produced eight strategic objectives. While acting as an organization or a community, the group identified how it could improve at the level of the internal processes and how to learn and grow into new. Raw definitions of these objectives are provided and presented, colour coded, together with the 4 levels of the IoT – Data | Information | knowledge | action.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Mission** |  | **Enhance Road Traffic Management capabilities** Look into opportunities to improve transport network performance while making use of connectivity and automation | | | | | | |
| **Vision** |  | **Cooperative Traffic Management** A Connected traffic system in which all elements act collaboratively towards safety, flow efficiency and emission reduction. | | | | | | |
| **Strategies** | | **'end to end' Communication** | | **'end to end' Collaboration** | | **'end to end' Performance** | | |
|  |  |  | |  | | |  | |
| **Customer**  **User** | | Improve the full extension of the 'end to end' road user experience, providing the best achievable balance between the individual's needs and the collective's best interest | | | | | | |
| **Process improvment** | | **2**  Promote Coopetition to ensure horizontal interoperability | **3**  Establish a architecture for the orchestration of cooperative services | | **4**  Reinforce the strategic interdependence of the public and private sectors | | | **5**  Develop 'new arbitration models' for building mutual benefit agreements |
| **Learning and Growing** | | **6**  Develop a TMPs and TCPs into a standardized Technology  'ITIL'  Leverage Resources and Portfolio | **7**  Ensure data transactions across multi value chains and dissemination channels | | **8**  Develop the roll-out of decentralized cooperative applications | | | **9**  Reinforce standardization for interoperability, consistency and synchronization |
| **Financial** | |  |  | |  | | |  |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Perspective** | **Objectives** | | **Description** | |
|  |  |  |  |  |
| **Customer**  **User** | SO1 | Improve the full extension of the 'end to end' road user experience, providing the best achievable balance between the individual's needs and the collective's best interest | | |
| **Process improvment** | SO2 | Establish a framework architecture for the orchestration of cooperative services | Promote the alignment of Public and Private sectors roadmaps to jointly address governance, organizational, functional or procedural issues in order to unlock the full potential of the cooperative market place, to provide collective measures or individual recommendations to the road user, under well-orchestrated services when required. | |
| SO3 | Develop 'new arbitration models' for building mutual benefit agreements | Increase binding cooperation, agreed between the different actors, framed under common ToR, partnership contracts, service levels agreements, open data agreements, or exploring rewarding behaviour mechanisms and creating incentives, in order to establish clear mutual benefits and win-win situations for all involved stakeholders across the different combinations of value chains providing single or bundled services. | |
| SO4 | Reinforce the strategic interdependence of the public and private sectors | Promote the mutual understanding and the coordination between the public and private sectors by strengthening cooperation and partnership to develop complementary actions, while making better use of resources and competences, in order to better prioritize, plan and implement measures/actions to be adopted under different scenarios (e.g. congestion, roadwork or planned events), different environments (e.g. urban, interurban, rural) and different contexts (e.g. locally and regionally). | |
| SO5 | Ensure data transactions across multi value chains and dissemination channels | Develop an attractive, sustainable, commonly operated data exchange framework, where every data transaction is fit to fulfil the needs of the involved actors, either as producers or consumers of data, to allow them to better communicate, cooperate and perform with each other, in order to improve the full extension of the 'end to end' road user experience. | |
| **Learning and Growing** | SO6 | Develop a TMPs and TCPs into a standardized Technology - 'ITIL' | Promote the development of a 'off-the-shelf' digital library for TMPs and TCPs, to be available via the National Access Points, following a fully interoperable, flexible and modular approach to be assembled following a building block logic, activated and triggered under specific conditions and with prearranged agreements between all the involved actors, or deployed 'on the fly', if the dynamic traffic conditions so demand. | |
| SO7 | Develop the roll-out of decentralized cooperative applications | Develop multi-branding Cooperative incident management services and applications, supported by adequate V2V and V2I communications that, when facing an incident, immediately take action, locally, without the need of intervention of the Traffic Manager, by signalling the location and making possible for others to be aware and advised to either change lane or adjust speed, improving safety and flow efficiency by taking advantage of higher levels of connectivity and automation. | |
| SO8 | Promote Coopetition to ensure horizontal interoperability | Acknowledge the benefits of cooperative competition to reach a higher value creation by promoting interaction either between private organizations or public bodies, to develop common implementations and methods of operation in order to ensure horizontal interoperability with new communication media and data sources coming over multi- dissemination channels, aiming to achieve a Common Operational Picture, necessary for the deployment of *Cooperative Traffic Management Services*. | |
| SO9 | Reinforce standardization for interoperability, consistency and synchronization | Improve the understanding of the data requirements for setting up decentralized applications or digital TMPs and TCPs, that are necessary to ensure 'end to end' interoperable and continuous services, to be provided consistently, at the right place and the right time, under different combination of actors, across multiple value chains, by developing recommendations, guidelines, data profiles, data specifications or new overarching data formats and interfaces between data standards. | |
| **Financial** | SO10 | Leverage Resources and Portfolio | | |

|  |  |  |
| --- | --- | --- |
|  | **Learning and Growing**  Research – H2020 | **Process improvement**  Large scale Deploymen - CEF |
| **Actions** | **Develop a TMPs and TCPs into a standardized Technology - 'ITIL'** | **Establish a framework architecture for the orchestration of cooperative services** |
| Promote the development of a 'off-the-shelf' digital library for TMPs and TCPs, to be available via the National Access Points, following a fully interoperable, flexible and modular approach to be assembled following a building block logic, activated and triggered under specific conditions and with prearranged agreements between all the involved actors, or deployed 'on the fly', if the dynamic traffic conditions so demand. | Promote the alignment of Public and Private sectors roadmaps to jointly address governance, organizational, functional or procedural issues in order to unlock the full potential of the cooperative market place, to provide collective measures or individual recommendations to the road user, under well-orchestrated services when required. |
| **Knowledge** | **Develop the roll-out of decentralized cooperative applications** | **Develop 'new arbitration models' for building mutual benefit agreements** |
| Develop multi-branding Cooperative incident management services and applications, supported by adequate V2V and V2I communications that, when facing an incident, immediately take action, locally, without the need of intervention of the Traffic Manager, by signalling the location and making possible for others to be aware and advised to either change lane or adjust speed, improving safety and flow efficiency by taking advantage of higher levels of connectivity and automation. | Increase binding cooperation, agreed between the different actors, framed under common ToR, partnership contracts, service levels agreements, open data agreements, or exploring rewarding behaviour mechanisms and creating incentives, in order to establish clear mutual benefits and win-win situations for all involved stakeholders across the different combinations of value chains providing single or bundled services. |
| **Information** | **Promote Coopetition to ensure horizontal interoperability** | **Reinforce the strategic interdependence of the public and private sectors** |
| Acknowledge the benefits of cooperative competition to reach a higher value creation by promoting interaction either between private organizations or public bodies, to develop common implementations and methods of operation in order to ensure horizontal interoperability with new communication media and data sources coming over multi- dissemination channels, aiming to achieve a Common Operational Picture, necessary for the deployment of *Cooperative Traffic Management Services*. | Promote the mutual understanding and the coordination between the public and private sectors by strengthening cooperation and partnership to develop complementary actions, while making better use of resources and competences, in order to better prioritize, plan and implement measures/actions to be adopted under different scenarios (e.g. congestion, roadwork or planned events), different environments (e.g. urban, interurban, rural) and different contexts (e.g. locally and regionally). |
| **Data**  **Metadata** | **Reinforce standardization for interoperability, consistency and synchronization** | **Ensure data transactions across multi value chains and dissemination channels** |
| Improve the understanding of the data requirements for setting up decentralized applications or digital TMPs and TCPs, that are necessary to ensure 'end to end' interoperable and continuous services, to be provided consistently, at the right place and the right time, under different combination of actors, across multiple value chains, by developing recommendations, guidelines, data profiles, data specifications or new overarching data formats and interfaces between data standards.. | Develop an attractive, sustainable, commonly operated data exchange framework, where every data transaction is fit to fulfil the needs of the involved actors, either as producers or consumers of data, to allow them to better communicate, cooperate and perform with each other, in order to improve the full extension of the 'end to end' road user experience. |

## I.IV Initiatives and Supporting Actions

After describing the Strategic Objectives the group identified the initiatives and the supporting actions, to carry while following the Balanced Scorecard methodology.

Six major Initiatives were proposed together with a description of the supporting actions. These were divided into two categories – short and medium/long term. This exercise helped the group to understand what could be the immediate steps, while acting 'as an organization' and also to better formulate the list of endorsed recommendations presented in Section 10.7.1.

The list of initiatives was cross-checked against the strategic objectives in order to assess which could create a higher impact.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | **Strategic Objectives** | | | | | | | |
|  |  | Develop a TMPs and TCPs into a standardized Technology - 'ITIL' | Develop the roll-out of decentralized cooperative applications | Promote Coopetition to ensure horizontal interoperability | Reinforce standardization for interoperability, consistency and synchronization | Establish a framework architecture for the orchestration of cooperative services | Develop 'new arbitration models' for building mutual benefit agreements | Reinforce the strategic interdependence of the public and private sectors | Ensure data transactions across multi value chains and dissemination channels |
| Nº | Initiatives |
|  |  |  |  |  |  |  |  |  |  |
| **I1** | Define the common tools for EnTM | **++** | **+** | **++** | **++** | **++** | **++** | **++** | **++** |
| **I2** | Defining data requirements for EnTM | **++** | **++** | **++** | **++** | **+** | **+** | **+** | **++** |
| **I3** | Define the Architecture requirements to foster Public and Private Collaboration | **++** | **+** | **++** | **+** | **++** | **++** | **++** | **+** |
| **I4** | Build up a Common Operational Picture | **+** | **+** | **++** | **+** | **++** | **++** | **++** | **++** |
| **I5** | Further develop the Cooperative Market Place | **+** | **++** | **++** | **+** | **++** | **++** | **+** | **++** |
| **I6** | Dissemination of EnTM across all Road networks | **++** | **++** | **++** | **+** | **++** | **++** | **++** | **++** |

(++) Strong Impact

(+) Medium Impact

|  |  |  |
| --- | --- | --- |
| **Initiatives** | | **Supporting Actions** |
|  |  |  |
| **I1** | **Define the common tools for EnTM** | **Short term**  Identification of TMPs Building Blocks Tools:   * Classification of Roads (Road priority in network); * Geo-fencing mechanisms to identify areas to avoid, structuring virtual delays in certain areas, due to vicinity to residential areas, or nearby Hospital, e.g. (Day 1 service zone access control could be used by SP to influence the route advice) * Minimum network performance LOS (Should be defined to distinguish between advice vs mandatory routing); * Agreement on trigger levels to engage Cooperative Incident Management.   . Spin off Cooperative TM Local and Regional measures/actions, to be adopted to face different events e.g. for recurrent congestion situations, roadwork or planned events, per type of road, section, lane or along certain period of the day. |
| **Medium/Long term**  . The geo-fencing mechanism should be the result of mutual public and private understanding;  . Route recommendations can be tailored and profiled for different user groups, such as freight trucks, electric vehicles or passenger transport.  . Pre-planned diversions (TMPs and TCPs) with pre-established actions between all the involved actors, should be made available to be triggered under specific conditions.  . Traffic Management Plans or Circulation Plans may be split into a sequence of short term intermediate plans. |
| **I2** | **Defining data requirements for EnTM** | **Short term**  . Standards for road / zone classification  . What are the traffic management feed needs, in terms of vehicle data (floating/probe)?  . Investigate which implementations (standards and specifications) should/could become mandatory.  . Establish interoperability at interface level between the several identified and relevant standards, such as DATEX, TPEG, CAM/DENM.  . Coping with the European Statement of Principle, to prevent road users from receiving unjustified notifications, may lead to the need to upgrade or revise the current standards, in order to ensure horizontal interoperability with the new communication media and data sources coming over multi- dissemination channels. |
| **Medium/Long term**  . Develop a commonly operated data exchange framework for Europe, similar to the ITS Protocol (NTCIP).  . Overarching formats and methods of operation are needed in the form of standards, profiles, guidelines or recommendations.   * Data must fulfil the needs of the involved actors, either as producers or consumers of data. * Data handling and data handing over along multi-stakeholder value chains.   . Enhance the location and information accuracy. |
| **I3** | **Define the Intelligent Governance framework requirements to foster Public and Private Collaboration** | **Short term**  . Develop a TMP Handbook to address the minimum common functional and organizational needs in order for all the stakeholders to provide end-to-end services.  . Balance resources or competences across different operational environments:   * cross border | urban | interurban | rural |
| **Medium/Long term**  . Outline the general terms for Win-Win agreements, under:   * common Terms of Reference, * common guidelines * service levels agreements, * open data agreements, * partnership contracts, * incentivize change behaviour mechanisms to the road user   . Encompass the need to mix and match between different technologies, implementing new functions or migrating into new areas, because of legacy issues. |

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| --- | --- | --- |
| **Initiatives** | | **Supporting Actions** |
|  |  |  |
| **I4** | **Build up a Common Operational Picture** | **Short term**  . Orchestration of the services needs to be envisioned, possibly as an information broker or service broker, at governance level.  . Along with the National Access Points and the increasing Cloud to Cloud Communications.  . Common Operational Picture:   * Shared among public and private, all relevant parties   + Including forecasting   + Triggers (or thresholds) to automatically initiate Cooperative Incident Management * Level of Service thresholds (Road segment specific)   . Update maps, in a timely way, accordingly to the changes made in the traffic circulation plans. |
| **Medium/Long term**  . Public Authorities need to formulate their mobility policies at strategic level;  . Better convey the messages from traffic managers to connected and automated traffic and vice-versa.  . Measures will be made available and disseminated in real-time, trough dynamic dialogue between all the involved actors  . Improved coordination between RO and SP will bring:   * Higher network performance, decrease of individual travel times * Consistency of information (road works e.g.) * For Road Works and Incident Management identify the information needs for level 4   . Future proof to uptake any additional communication channels used to inform road users (V2V/V2I)  . Explore the usage of new data sources.   * CAM/DENM/PVD * Social Media |
| **I5** | **Further develop the Cooperative Market Place** | **Short term**  . Realize the value of the 'connected vehicle' as a receiver/consumer and as a broadcaster of safety related and real time traffic information  . Digitize a functional Road Works Traffic Manual.  . Cooperative Incident Management (Roadworks, Lane closure, Protected accident area…)  . Explore the benefits of combining dynamic speed limits with intelligent speed assistance. |
| **Medium/Long term**  . Cross Brand Cooperative Lane changing.  . Cross Brand Cooperative Lane merging.  . Cross Brand Cooperative Ramp metering.  . Standardize On-street Parking data, facilitating parking at the end of a journey and promoting modal shift.  . Standardize Traffic lights data at intersections for smooth driving combined with new priority schemes for Public transport or emergency vehicles.  . Cooperative Intersection Crossing.  . Internalize flow efficiency externalities, (such as lost hours) into the vehicle design to stimulate the development of cooperative features |
| **I6** | **Dissemination of EnTM across all Road networks** | **Short/Medium term**  . Establish KPIs to determine best practices for policy, supervisory and governing / technical aspects in the tool development and application, cooperation, data needs, sharing and access and the cooperative marketplace  . Establish best practices based on experiences collected,  . Pack up the main tools (data and architecture requirements, Common Operational Picture, Cooperative Services) as State of the Art across the Urban Nodes along the Ten-T Corridors.  Outreach to all road networks, by sharing experiences and best practices, upscaling and replicating the EnTM State of the Art package. |
| **Medium/Long term**  . Demonstrate the Benefits of Cooperative Management Services across real life Use Cases  . Establish a flexible migration path for the next Urban generation to take up the benefits of cooperation, while making better use of resources and competences, in order to:   * better prioritize, plan and implement measures/actions * adopted under different scenarios (e.g. congestion, roadwork or planned events), different environments (e.g. urban, interurban, rural) and * different contexts (e.g. locally and regionally). |

## I.V From Strategy to Project pipeline

The short term actions were organised, over a two year period, into a Gant Chart, to better establish their dependences and priorities.



1. <https://en.wikipedia.org/wiki/Balanced_scorecard>. [↑](#footnote-ref-1)
2. https://en.wikipedia.org/wiki/Game\_theory#Cooperative\_.2F\_Non-cooperative [↑](#footnote-ref-2)
3. https://en.wikipedia.org/wiki/Nash\_equilibrium#Network\_traffic [↑](#footnote-ref-3)
4. https://en.wikipedia.org/wiki/Coopetition [↑](#footnote-ref-4)