

# TM 2.0

ENABLING VEHICLE INTERACTION WITH  
TRAFFIC MANAGEMENT



2017

## About TM 2.0

The TM 2.0 ERTICO platform originated in 2011 by TomTom and Swarco and was formally established on 17 June 2014 during the ITS Europe Congress in Helsinki. It now comprises 38 members from all ITS sectors focusing on new solutions for advanced interactive traffic management.

The term TM 2.0 is used for both the concept of interactive traffic management and the platform of members working on innovating and materialising it. The TM 2.0 platform works in task forces (TFs) of 3-6 members to examine topical issues with the aim to achieve convergence among the platform members on the 'How' and the 'What' of the TM 2.0 concept.

The platform aims to agree on common interfaces, principles and business models which can facilitate the exchange of data and information between road vehicles and Traffic Management and Control Centres (TMC). This is crucial for improving the total value chain for consistent traffic management and mobility services as well as avoiding conflicting guidance information on the road and in the vehicles.

## TM 2.0 in 2017

The work of the Task Forces (TFs) in 2014-2016 depended and relied greatly on that of the previous years. Previous TFs have produced valuable reports that help the members develop the TM 2.0 concept further every year. Past TFs include:

1. Viability Analysis and Recommendations
2. Barriers and Enablers
3. Principles for Data
4. Value Proposition
5. Deployment Steps
6. TM 2.0 Quantification of Benefits
7. Role of Automation in Traffic Management - Phase 1
8. Exchange of Traffic Management Plans - Phase 1

Reports from past TFs are available on the TM 2.0-internal project place and/or upon request from the ERTICO TM 2.0 coordinator.

There are currently five ongoing Task Forces that launched their activities in the autumn of 2016.

1. Role of Automation in Traffic Management - Phase 2 (until Jan 2017) Phase 3 (from March 2017)
2. Exchange of Traffic Management Plans - Phase 2
3. Contractual Agreement and Schemes
4. Exchange of Best Practices on Deploying TM 2.0
5. Traffic Management and Links to Other Modes and Interfaces



## What our members see as being the value of TM 2.0

*"TM 2.0 is an important enabler for traffic managers and all stakeholders, supporting the deployment of key technologies and solutions like connected automation, in order to pave the road to new mobility concepts and a new transport era."*



### Angelos Amditis, ICCS

*"Public and private stakeholders are joining forces to complement and connect existing traffic management plans which will ensure a higher level of service in terms of increased traffic efficiency on the network and improved safety in terms of incident response and mitigation measures."*



### Lina Konstantinopoulou, ERTICO-ITS Europe

*"Ease, efficiency and sustainability of transportation is important to achieve, in an environment becoming continuously more complicated and uncertain. The deployment of the TM 2.0 concept will improve mobility and accessibility by enabling smart interactions between technologies, service providers and travelers."*



### Evangelos Mitsakis, CERTH

*"TM 2.0 is not only about the next traffic management collaborative paradigm, but also about opening new business challenges that need to be tackled with new forms of synergies among the main categories of stakeholders in the mobility field – boasting complementary knowledge, data and skills – in a completely interconnected environment."*



### Laura Coconeia, Swarco

*"The third phase of TM 2.0 sees the establishment of a strong platform of members aligning their efforts to make interactive traffic management work. TM 2.0 is not only a platform but a concept, a way of working together exchanging information on traffic management and traffic state between the public authorities and the private service providers."*



### Johanna Tzanidaki, TomTom

*"The open and productive sharing of ideas and different European traffic management visions in TM 2.0 leads us to new insights in how road operators and service providers can strengthen each other by exchanging traffic management information."*



### Jop Spoelstra, Technolution

*"When TM 2.0 fulfills its promise, road users will experience a new and unprecedented service level. This can only be provided if road managers and navigation service providers combine their strengths and help each other achieving public and business goals at the same time. This approach will launch the sector in the much needed modern age of collaborative government and entrepreneurship."*

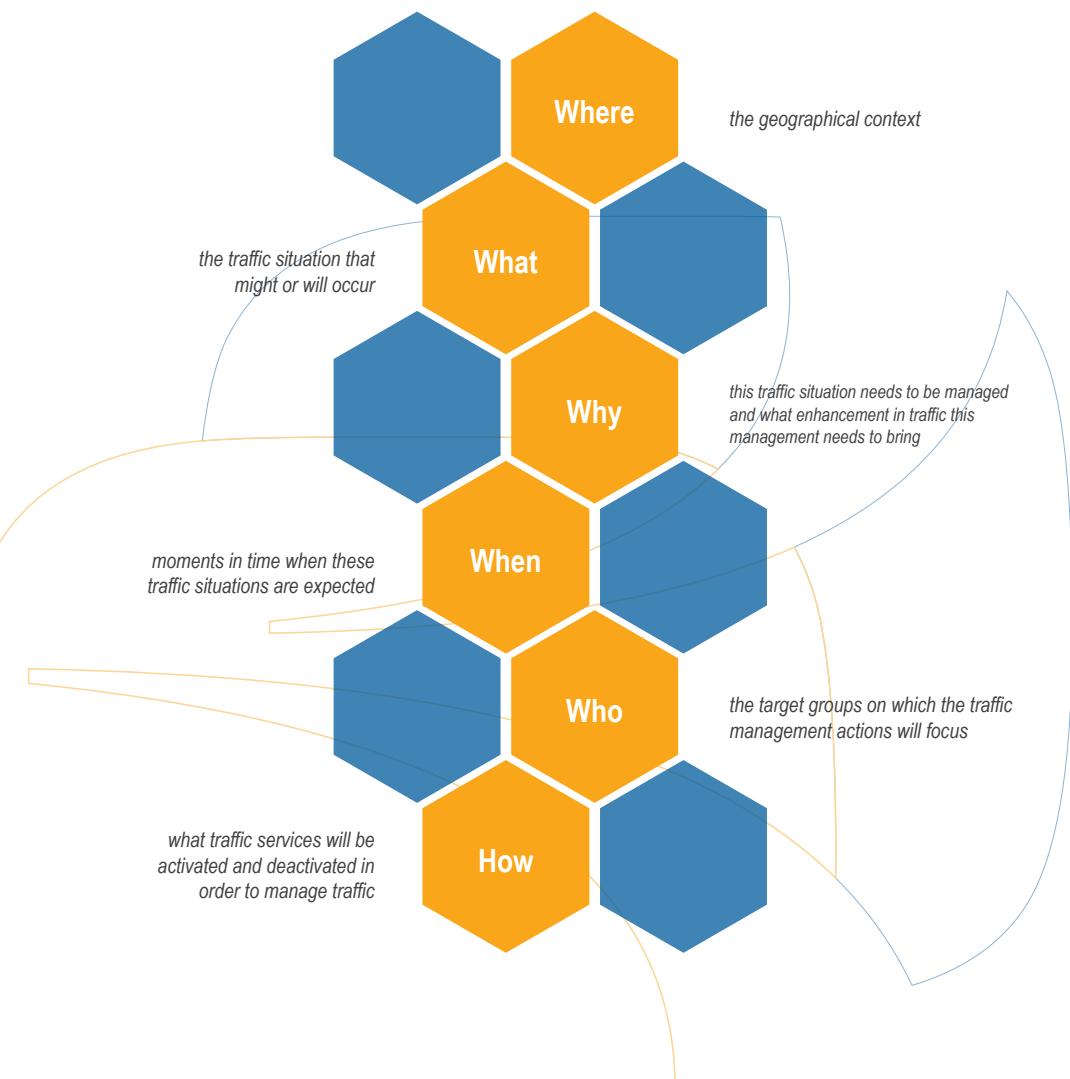


### Olaf Vroom, NDW / Rijkswaterstaat

## Traffic Management Plans

Our partners agree that Traffic Management Plans (TMPs) are key to the TM 2.0 concept. Traffic management plans and measures are often not directly interchangeable between different urban areas and/or regions. It is therefore necessary that they are tailored to local requirements and that they reflect local priorities and needs. Traffic management requirements stem from and have direct policy implications. Thus policy decision makers are well expected to be involved in decision making with regards to traffic management strategies and actions.

## Elements of a Traffic Management Plan



## The win-win

All members in the TM 2.0 platform believe that cross stakeholder sector collaboration (on both strategic and operational levels) can result in a win-win for all actors in the TM 2.0 system: road network users, traffic management centres and public authorities, and data and infrastructure service providers. Good business can only be based on a win-win for all and TM 2.0 gives full recognition to that principle.

-  **Road network users** will benefit from a more relaxed and better informed driving experience by avoiding congestion, receiving relevant information, and by improved road safety.
-  **Traffic management centres and public authorities** will be able to better manage their traffic flows and avoid traffic collapse and congestion, unnecessary emissions, providing enhanced traffic information accuracy.
-  **Data and infrastructure service providers** will be able to provide the best route options for their users, provide solutions rather than merely report problems, and be able to provide regional information as part of an integrated traffic information service.

Better informed drivers means safer and more efficient use of the transport network for all stakeholders (public authorities, private service providers and users alike).



## Benefits of TM 2.0

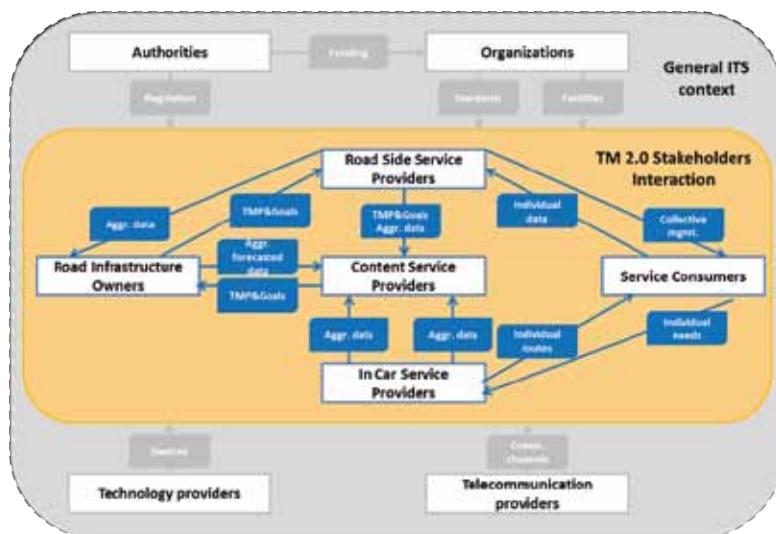
The benefits of the TM 2.0 platform were assessed and summarised by the Task Force on Value Proposition during the course of its work in 2015-2016.

In order to assess the diversity of needs, and ensure that the 'win-win' principle is followed, the TF on Value Proposition examined four cities / regions in Europe, namely the city of Thessaloniki, the region of Helmond – Eindhoven – Tilburg, the federal state of Salzburg and the city of Barcelona. The TF analysed their common vision of how TM 2.0 can help in coping with the different challenges in their respective traffic management practices.

City administrators / traffic managers	Drivers	Traffic information service providers
<ul style="list-style-type: none"><li>☛ avoid congestion and traffic collapse</li><li>☛ avoid unnecessary emissions</li><li>☛ improve TMP complementing or replacing loop detectors and enhancing accuracy</li><li>☛ TMP measures reach driver directly</li><li>☛ FCD-enabled TM even in roads with no ITS (scalable)</li></ul>	<ul style="list-style-type: none"><li>☛ avoid congestion: more relaxed driving</li><li>☛ receive relevant regional information in-vehicle</li><li>☛ improved road safety through smoother traffic flow</li><li>☛ best route options aligned with TMPs</li></ul>	<ul style="list-style-type: none"><li>☛ provide best route option for the destination (not only fastest)</li><li>☛ provide information that goes beyond congestion</li><li>☛ provide solution (best route option) not the problem (congestion info) well in advance</li><li>☛ regional information becomes part of an integrated service</li></ul>

## The TM 2.0 Ecosystem

The Task Force on Viability Analysis (active 2014 -2015) produced the following organisational model architecture representing the ITS ecosystem within which the TM 2.0 actors are active.



## **Task Force on Role of Automation in Traffic Management – Phase 2**

### **Leader: ICCS (2015 - 2017)**

Traffic Management should be capable of regulating and monitoring the circulation of mixed fleets of manually-driven and autonomous vehicles within the network, while aiming to achieve the network's optimum functionality. Optimum efficiency of traffic flow and maximum safety for all traffic participants are the target of TM 2.0.

In its second phase, the Task Force on Role of Automation in Traffic Management focused on the requirements that Traffic Management Centres and infrastructure should satisfy in order to achieve the above mentioned goals by analysing specific use cases which involved mixed traffic in urban and highway environments. The objective was to study the conditions necessary for TM to handle specific traffic scenarios involving vehicles at several levels of automation.

The work conducted within the Task Force highlighted the need for a smart local TMC, which should maintain a dynamic registry of automated vehicles in its area of control, possibly integrated within a local dynamic map. This local TMC will be responsible for communicating information to the automated vehicles and to the service providers while the reception of the communicated information has to be verified by the automated vehicles. Setting priorities in data transfer may be beneficial, for example prioritising probe data exchange from autonomous vehicles against data download for entertainment. Smart algorithms in the local TMC could calculate and propose appropriate speeds to all vehicles approaching an intersection or to vehicles approaching a traffic jam for optimising the flow. Extensions or complementary definitions in standards will be needed to communicate the necessary information, including the level of automation of a vehicle and its planned path.

The Task Force on "Role of Automation in Traffic Management" has finalised its second phase. A final report summarising the key outcomes is expected in June 2017. The Task Force is now entering phase 3 and will focus on the requirements that the 'digital infrastructure' needs to be able to satisfy with regard to handling and hosting automation.

## Task Force on Exchange of Traffic Management Plans – Phase 2

### Leader: Technolution (2015 - 2017)

The TM 2.0 Task Force on the Exchange of Traffic Management Plans (TMPs) aims to enable, facilitate and accelerate information exchange among traffic management stakeholders. The focus is to advance access to policy and strategy based plans and actions set by public authorities and road operators.

In phase 1 (2015-2016), we identified what TMPs are as well as who the stakeholders involved in TMP exchanges are. We also identified five concrete use-cases along with their related challenges as examples of what TM 2.0 TMP exchange means in practical terms.

In phase 2 (2016-2017), the focus has shifted towards understanding *why* TMPs are to be exchanged: How can stakeholders with different backgrounds understand the reasons and context of traffic measures taken by others? This will be performed at both the tactical level (where TM policy is translated into traffic plans and scenarios) and the operational level (where traffic data and plans are actually exchanged in daily practice).

On the tactical level, a guidelines document is being drafted on the best approaches to getting different stakeholders aligned when traffic measures are to be implemented.. For example, involving road authorities and service providers at an early stage when designing traffic plans, helps to clarify the background of certain measures. An important element for the creation of a better understanding among TM actors and a justification of why and how private service providers can implement these measures.

On the operational level, the leverage of several existing communication protocols will be assessed in their potential to facilitate the TM 2.0 TMPs exchange, and whether or not adaptations or extensions are required. These protocols are TPEG, DATEX II and the DVM-Exchange and this TF liaises with the organisations that have the expertise to work on them: TISA, the DATEX II Community and the DVM Exchange Community.

## Task Force on Contractual Agreement and Schemes

**Leader: NDW / RWS (2016 - 2017)**

The objective of the TM 2.0 Task Force on Contractual Agreements is to analyse the cooperation between public and private stakeholders in Traffic Management with respect their priorities and needs, and without interfering with their strategic business plans.

Traffic management has traditionally mainly been the responsibility of public road authorities providing roadside measures while traffic-related mobile/in-car services (traffic information, route guidance, etc.) rests mainly the domain of private service providers. For optimal use of the road network, cooperation between all stakeholders is a necessity. This means that their often conflicting objectives and priorities must be aligned by exchanging traffic data and traffic control data and by a common traffic management strategy.

The Task Force on Contractual Agreements and Schemes started in November 2016 by focusing on enablers, barriers and motives with regard to different models for the TM 2.0 cooperation framework.

In its first phase the TF conducted desk research on possible TM 2.0 cooperation strategies:

- 1) Basic data cooperation: optimisation of public and private databases by data exchange of Traffic Management Plans (TMPs) and Floating Car Data (FCD)
- 2) Cooperation Level 1: display of the public strategic route after positive evaluation by private service providers
- 3) Cooperation Level 2: compulsory display of public strategic route by the service providers
- 4) Cooperation Level 3: mandatory takeover of public strategic route by the service providers
- 5) Cooperation Level 4: traffic will be distributed according to individual destinations and free capacity slots on different routes will be a guiding factor

These cooperation levels require public procurement and/or a regulatory environment in order to facilitate the attainment of TMP goals. However, they may interfere with private strategic business plans. A traffic management approach based on distributed (decentralised) traffic intelligence using data from the TMCs and service providers, combined with a targeted supportive traffic management policy framework is shown by research to be more effective for the transport ecosystem than a centralised, collective approach to traffic optimisation. For road authorities, a supportive set of instruments (such as giving credit points for making public desirable route choices available on in-vehicle display) could serve as the missing communication link between traffic management centers and road users.

In the second phase (since March 2017) the TF is looking to further develop the idea of a supportive policy framework with an analysis of enablers, barriers and motives for the different levels of cooperation.

On completion of its work, the TF on Contractual Agreements will contribute guidelines and recommendations regarding contractual agreements and schemes to the TM2.0 platform. A final report summarizing the key outcomes is expected in September 2017.

## **Task Force on Exchange of Best Practices**

### **Leader: CERTH and Technolution (2016 - 2017)**

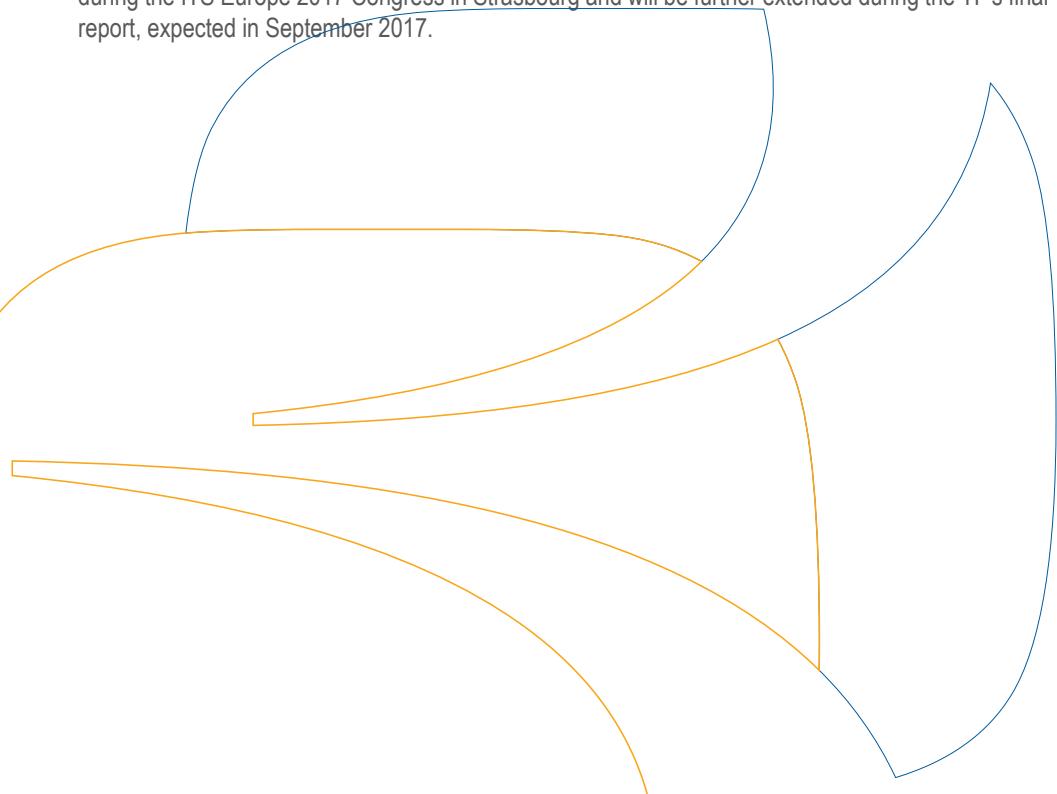
The TM 2.0 Task Force on Exchange of Best Practices started its activities in October 2016. The objectives of this TF are:

- Recording, analysis and exchange of best practices on deploying TM 2.0 at city and region level
- Speeding up the development of innovative solutions for advanced active traffic management by supporting the TM 2.0 Innovation Procurement process, with focus on currently ongoing initiatives in EU member states
- Synergies with relevant market places and innovation platforms, such as Mobility-as-a-Service initiatives

The main outcome of the TF activities will be an inventory of best practices and a classification at city, services and objectives level. To achieve this, the TF has designed a questionnaire and conducted a survey to collect information on best practices concerning TM 2.0, implemented either as a whole or partially.

The questionnaire, which covers, General description of the implementation, Partnership and costs, Results, Data exchange issues and Lessons learnt, has been distributed to more than 40 relevant authorities, including cities, ministries and TMCs.

The preliminary results of the questionnaire form the basis for a technical paper that will be presented during the ITS Europe 2017 Congress in Strasbourg and will be further extended during the TF's final report, expected in September 2017.



## Task Force on Traffic Management and Links to Other Modes and Interfaces

### Leaders: ERTICO and SWARCO (2016 - 2017)

Currently standard traffic apps and internet searches cannot provide real-time information regarding port traffic, bridge use, and parking in port areas. The use of innovative, IT-based traffic information systems and an integrated port traffic control centre will ensure improved traffic flows and optimum usage of the port routes. Ideally information about how, when and where people and freight plan to travel or are travelling will form part of the data exchanged between traffic management centres (TMCs) and service providers (SPs) so that the (re)routing options offered to the travellers can meet both the above mentioned objectives and the individual traveller's needs.

There is an opportunity to use a port-wide traffic management system that constantly records, processes and distributes transport and traffic information to all interested parties including service and content providers and ports. Extending the TM 2.0 approach to link TMCs with the hinterland transport management centres opens up new horizons for additional Traffic Management stakeholders such as ports, and enables them to be part of the urban plans and measures in the city while also allowing them a more active role in the decision making process of traffic management.

This TM 2.0 Task Force aims to recommend solutions for linking the next generation of traffic management, for Intermodal and Synchromodal transport, to the hinterland.

By connecting the digital and physical infrastructure in traffic management, this TF will show links to other modes of transport in areas of freight and logistics as well as public transport.

The Task Force on Traffic Management and Links to Other Modes and Interfaces will work in two phases to achieve its overall objectives.

The objectives of phase 1 are to:

- ▣ Analyse the requirements, data interfaces and standards for next generation Traffic Management systems and link to hinterland (especially Ports)
- ▣ Identify urban and peri-urban use cases which will be relevant for deploying TM 2.0

The objectives of the phase 2 are to:

- ▣ Analyse the value proposition, business models and governance patterns (involvement of new stakeholders including service providers in the supply chain)
- ▣ Propose roadmap or strategy plan for an integrated port-road traffic management systems

Currently in phase 1 the TF is studying the data interfaces and harmonising the integrated intermodal traffic management from the perspectives of the public authorities, service providers and users. A state of the art analysis is being prepared based on five pilot port case studies. Data from the ports of Hamburg, Antwerp, Livorno, Trieste and Aalborg is being used in creating different use cases that can exemplify the need for possible additional interfaces or standards (DATEX II/TISA) as well as policy recommendations.

## Join us! Shape the next generation of traffic management!

- ➡ To experience the front lines of building the next generation of traffic management
- ➡ To meet and learn from like-minded enthusiasts
- ➡ To experience real-life implementation of C-ITS
- ➡ To learn and understand the perspectives of both public and private stakeholders
- ➡ To get involved in a variety of task forces providing short and long-term results

## TM 2.0 Members

### Public Authorities



### Service Providers



### Traffic & Transport



### Research



### Associations



For further information  
and membership  
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