Masterplan Report

Version 1.0

Table of Contents

List of Figures

TM 2.0 Masterplan

Introduction

The ERTICO Innovation Platform on interactive traffic management, TM 2.0 groups together traffic management stakeholders, such as OEMs, Traffic Information Service Providers, Road Infrastructure providers, Public authorities and Road Operators for cities and regions in Europe responsible for the management of urban as well as interurban traffic, ITS research centres and road-network users associations. The TM 2.0 concept focuses on enabling vehicle interaction with traffic management plans and procedures. The purpose of this report is to present a short (2020), medium (2025) and long-term (2030) vision to support the goals of TM 2.0.

Main Objectives for the Masterplan

The tasks of TM 2.0 on Masterplan are to:

- Outline the means of reaching the next phase: TM 2.0 Test & Assess => towards marketplace implementation
- to set the roadmap of the TM 2.0 Platform that will help to deploy TM 2.0
- To give the opportunity for the TM 2.0 members to include proposals for next Task Force work

The layers to address are multiple: Urban, Corridors and Hubs

Proposed strategy and timeline is the following:

2018: To set up TM 2.0 pilot schemes (2018) and to determine the changing role of the public authorities as service provider (2018)

2019: Certification of TM 2.0 systems and services (2019) (M: C-ITS deployment)

2020: Deployment of TM 2.0 services in mixed traffic (2020)

2022: TM 2.0 for Cooperative, connected and automated mobility CCAM (2022)

2025: TM 2.0 trusted networks (2025)

2028: TM as a Service (2028)
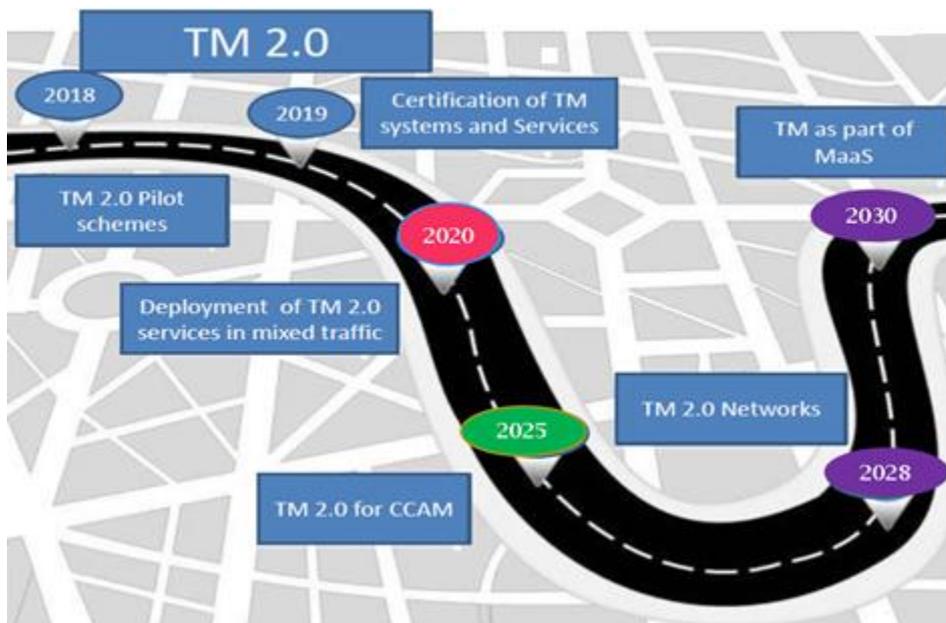
Figure 1: Proposed strategy and timeline

Future scene in traffic management

Developments of Cooperative, Connected and Automated Mobility are happening ever faster and hold the promise of further increased safety and more inclusive mobility solutions. However; in order to be successful there needs to be a careful assessment of the means of integration of these new solutions in both existing traffic and on existing infrastructure. The figure below was developed after the first phase of the C-ITS Report and presents a nonbinding Timeline.

Figure 2: EC diagram "Towards CCAM"

Cooperation models for PAs and SPs will change, KPIs and relevant metrics will need to be redefined; consistency between physical and digital infrastructure will need to be built. The TM 2.0 platform will have to play a major role there.
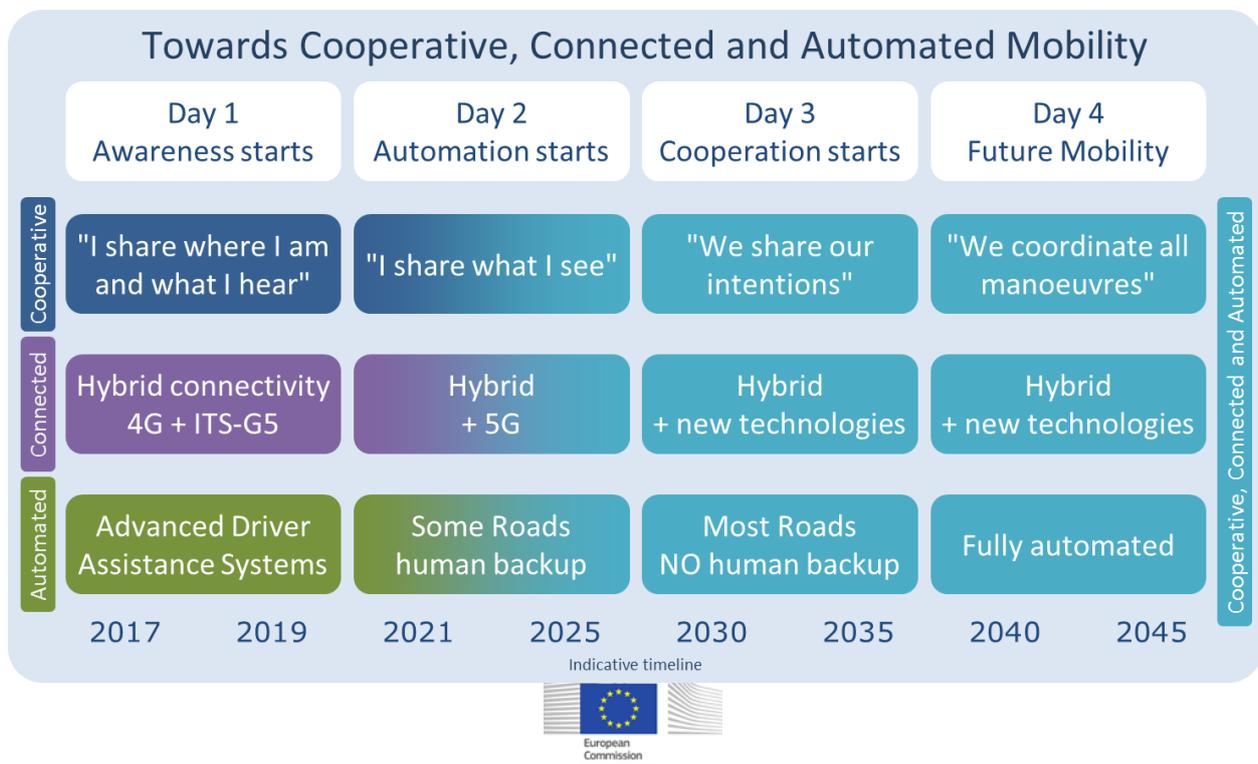
A key aspect is developing a clear view on day 1 to 4:

- Day 1: technologies mature enough to be deployed today
- Day 2: cooperative systems – V2X developing (Negotiation will be needed)
- Days 3-4 have been more blurry ('Orchestration of mobility services' will require a 'conductor')

One could compare the mobility of the future as an 'orchestra' of different transport systems. The vision of a world where everything is connected (everything, everyone, everywhere) does not have to be incompatible with the diversity of options, freedom of choice and decentralized system governance, but the 'orchestration of mobility services' will require a 'conductor'.

Challenges of the TM 2.0 ecosystem in 2020, 2025 and 2030

The main challenge of TM 2.0 is to cope with technological innovation. TM 2.0 will enable data integration from different sources and will need to become more interoperable. New trends will have to be dealt with by the Traffic Management Centers.

2020
- *Level 3 AVs on the road*
- Relevant infrastructure and greater connectivity in place to move from scattered TM pilots to broad deployment

2025
- *Level 4 AVs on the road*
- Managing transition between conventional and automated vehicles
- Proactive traffic management
- Need to have dedicated testbeds in cities and corridors on the Highways

2030
- Adoption of Blockchain, a key facilitating technology, will depend upon big players and the rate of infrastructure development.
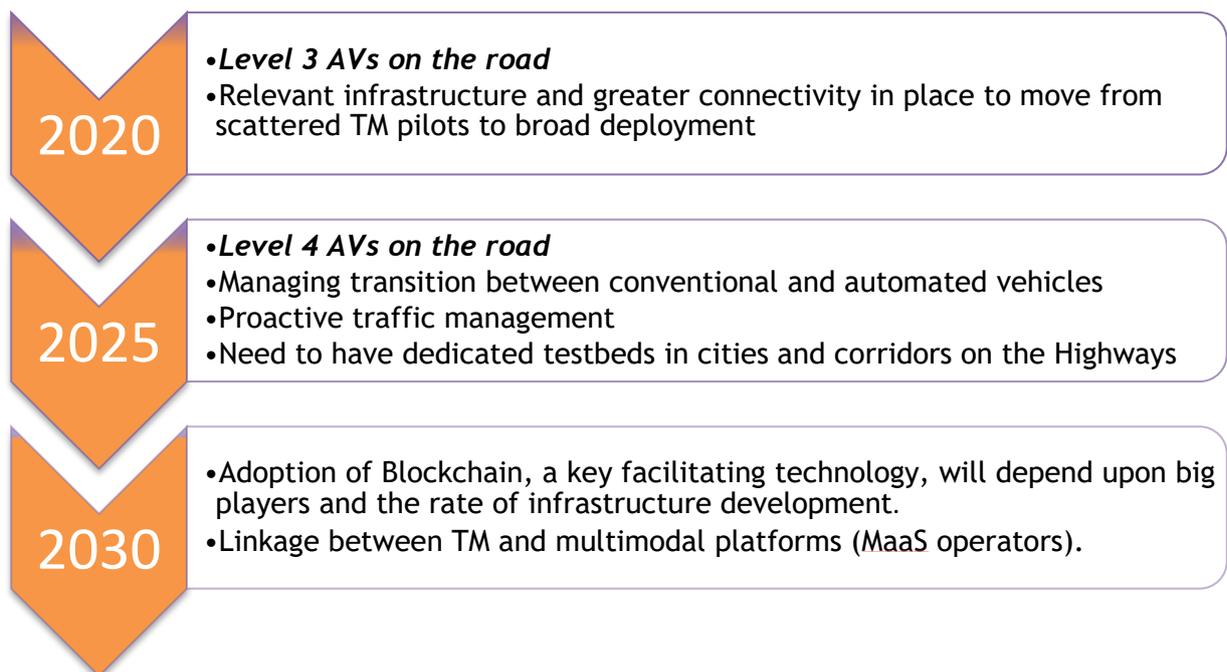- Linkage between TM and multimodal platforms (MaaS operators).

Figure 3: Challenges of the TM 2.0 ecosystem 2020-2025-2030

Overall challenges for horizons 2020-2025-2030 will be:

- Regulations: incentive systems to be put in place;
- GDPR: "Privacy" to be defined in a way that driving data may become Public information);
- Cyber security: Increased security of data due to new cybersecurity solutions.

Use cases of the TM 2.0 ecosystem in 2020, 2025 and 2030

Use cases are used at a higher level often representing stakeholder goals. In general, TM 2.0 data can be used to set-up a dynamic parking guidance and slot booking system for future development in urban areas, highways and hubs. Other use cases are intelligent speed management and Platooning. At a later stage, V2X communication systems enable better communication and negotiation and can be applied mainly for driver warning applications in the context of road safety and traffic efficiency.

TM 2.0 Use case driven development over the period 2020-2025-2030 will be a key characteristic for many process models.

2020
- Dynamic TM/dynamic incident info exchange
- Load balancing
- GLOSA, IVS signage

2025
- Smart parking management
- Increased road capacity / slot management
- Intelligent speed management
- V2X – towards negotiation

2030
- Automated car sharing schemes & TM
- Mixed traffic situation
- 'Orchestration' combined with MaaS
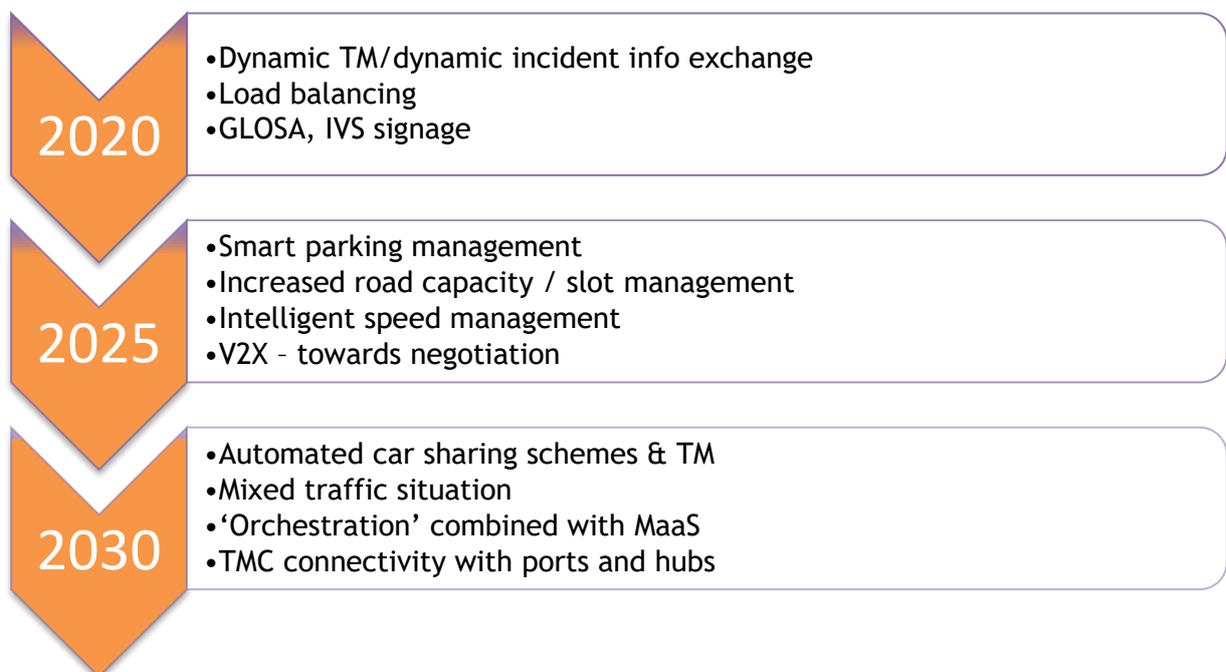- TMC connectivity with ports and hubs

Figure 4: Use cases of the TM 2.0 ecosystem 2020-2025-2030

Comments on figure 4

Roles of Stakeholders in the TM 2.0 Ecosystem

For the Masterplan, the following question was tackled: What should be the Cooperation between Public Authorities (PAs) and Service Providers (SPs) to provide best traffic experience to end users?   What are the roles of the different stakeholders?

The Role of Public Authorities (PAs) becomes more important. Collaboration with private providers, Delivery of high data quality, Guarantee a TM 2.0 unified data server and Solving legal issues (privacy) will be top priorities. Traffic Management Centers move from reactive to proactive traffic policies taking responsibility for the implementation of actions defined by the PAs. The Service Providers (SPs) on their side will be able to act on behalf of the PAs (if the latter so wish), taking responsibility for acting but not exercising decision making power. OEMs will be changing from automotive manufacturers to private transport solution providers (MaaS perspective).

Actions of the TM 2.0 ecosystem in 2020, 2025 and Outreach 2030
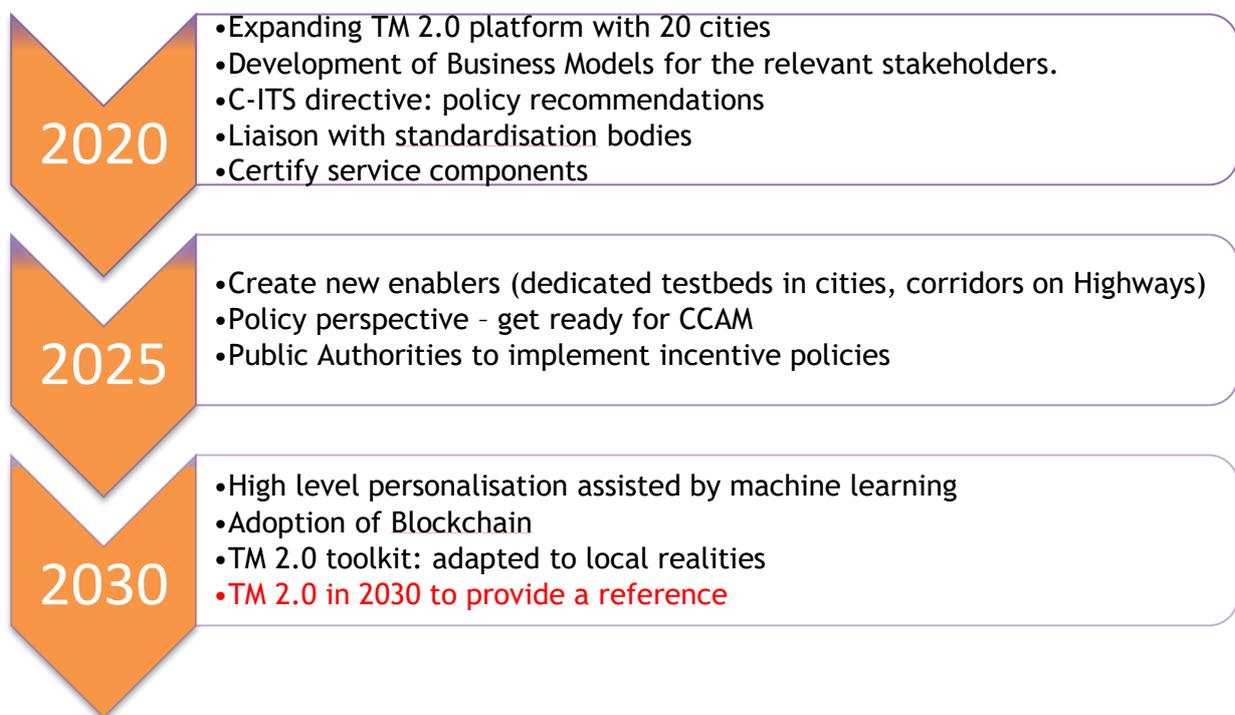
A series of main future actions are mapped below.

2020
- Expanding TM 2.0 platform with 20 cities
- Development of Business Models for the relevant stakeholders.
- C-ITS directive: policy recommendations
- Liaison with standardisation bodies
- Certify service components

2025
- Create new enablers (dedicated testbeds in cities, corridors on Highways)
- Policy perspective – get ready for CCAM
- Public Authorities to implement incentive policies

2030
- High level personalisation assisted by machine learning
- Adoption of Blockchain
- TM 2.0 toolkit: adapted to local realities
- TM 2.0 in 2030 to provide a reference

Figure 5: Actions and outreach of the TM 2.0 ecosystem 2020-2025-2030

TM 2.0 Pilot sites

An important step is to provide valid and up-to-date information of the pilot cities regarding TM 2.0 technologies and the integration of their information in a transferability tool. TM 2.0 selected pilot sites so far are: Socrates 2.0 project cities: A'dam, Antwerp, Copenhagen and Munich, Region North-Brabant in the Netherlands; Individual Targets: Paris, London, Glasgow, Hamburg, Madrid, Barcelona, Warsaw, Budapest, Bremen, Rome, Thessaloniki; Link with the city platforms (Polis + Eurocities +Smart Cities NMS). Expansion of TM 2.0 pilots is a must as it will improve the assessment of a common vision in how TM 2.0 can help in facing the different challenges in traffic management practices.

Next Steps for near future

In terms of specific future expectations, one of the most common calls is for deployment and moving from the theory to deployment. Actions to be taken on short notice are:

- liaise more with the Socrates 2.0 project.   Socrates 2.0 is about the real life practice/ actual deployment in 3-4 different pilots of the entire TM 2.0 concept and links to the trusted network.
- continue progress on guiding agreements between traffic managers and SPs

Furthermore, new Task Forces should be set up:

- a TF on TM 2.0 as a Trusted Network. A trusted platform should speed up the development of innovative solutions for advanced active traffic management.
- a TF on TM 2.0 in liaison with MaaS. Cooperation with Initiatives such as MaaS Service Providers will help to ultimately reach the masterplan goal of integrating TM 2.0 with MaaS in 2030.

Conclusion

In 2020, Level 3 automated cars are expected to be on the road network. A coordination mechanism will allow PAs to align their efforts with other stakeholders in order to respond to the new and future functionalities of TM. By 2020 we should be aiming to have regulation and new technologies in alignment. Data protection will need to be further developed and adapted to the new needs. More TM 2.0 deployment reference cases, currently including the SOCRATES 2.0 project, is important. Efforts will be made towards overcoming challenges such as moving from scattered TM 2.0 pilots and concepts to broad deployment. It is key that more cities become active in the TM 2.0 platform.   TM 2.0 needs to bring a tangible TM 2.0 system that is more or less ready to use and transferable.

By 2025 we may see level 4 automated vehicles AVs (AVs, but monitoring by a driver is still required) on the road network. PAs will be more involved in the digitalisation of infrastructure and in managing the transition from conventional (legacy) to automated vehicles (AVs). Advanced mechanisms to make TM successful in 2025 should be put in place, such as geo-fencing, minimum requirements for connectivity of vehicles, and freight and transport corridors to enable that TM takes place on the right conditions. Relevant use cases, including Platooning, V2X – towards negotiation, MaaS should be promoted and their wider deployment should be encouraged.

Horizon 2030 is more oriented to future models for TM 2.0 such as Marketplace implementation (e.g. Appstore of services), development of innovative solutions and innovative procurement process.

In 2030, interactive TM will be in place and this will enable PAs to have a clear understanding of system performance and of the different actor's performance within the given framework, for example emissions. OEMs will be changing from automotive manufacturers to private transport solution providers (MaaS perspective). The user is seen as demanding seamless integration of services, easy payment options (pay as you go, monthly or flat rate), freedom of mobility, different and preferred options, real time traffic information of high quality, safety, accessibility and low costs. The MaaS platform will more and more have to assume a key role as MaaS operators and will become increasingly central in the mobility system.

TM will be functioning as Traffic management as a Service and it should meet goals set by policy makers in full dialogue with stakeholders while the 'orchestration' within the operational model remains in the hands of PAs. Adoption of Blockchain will be a key facilitating technology, although the speed of adoption will depend upon big players in the value chain and the rate of infrastructure development.

In the end, all stakeholders will have to comply with the reference architecture & specifications to make the vision work.

"TM 2.0 as the Reference" should become a reality.

References
[1] ERTICO- ITS Europe. (2018). *TM 2.O Masterplan Task Force Workshops on 1/2/2018 and 26/07/2018 and TM 2.O Survey May 2018*
[2] SOCRATES 2.0: https://socrates2.org/
[3] EC https://ec.europa.eu/transport/themes/its/c-its_en