



Digital infrastructure TaskForce (TF)
TM 2.0 in co-operation with TN-ITS
ERTICO Innovation Platform
(TF Leader: Christian Kleine – Here)



Motivation

- Work on a clearer vision between TM 2.0 and digital infrastructure
- Optimizing usage of digital infrastructure in Traffic Management
- Final goal: achieve sustainable travel in urban and interurban areas

Background

There is a need to adapt existing physical infrastructure and to deploy new digital infrastructure for automated driving and transport. The digital infrastructure needs (should) to support connected automated driving.

Infrastructure Support levels for Automated Driving (ISAD)

Elaborated in cooperation with INFRAMIX, see also ITS World Congress 2018 paper by AAE & ASFINAG

	Level	Name	Description	Digital information provided to AVs			
				Digital map with static road signs	VMS, warnings, incidents, weather	Microscopic traffic situation	Guidance: speed, gap, lane advice
Digital infrastructure	A	Cooperative driving	Based on the real-time information on vehicle movements, the infrastructure is able to guide AVs (groups of vehicles or single vehicles) in order to optimize the overall traffic flow.	X	X	X	X
	B	Cooperative perception	Infrastructure is capable of perceiving microscopic traffic situations and providing this data to AVs in real-time	X	X	X	
	C	Dynamic digital information	All dynamic and static infrastructure information is available in digital form and can be provided to AVs.	X	X		
Conventional infrastructure	D	Static digital information / Map support	Digital map data is available with static road signs. Map data could be complemented by physical reference points (landmarks signs). Traffic lights, short term road works and VMS need to be recognized by AVs.	X			
	E	Conventional infrastructure / no AV support	Conventional infrastructure without digital information. AVs need to recognise road geometry and road signs.				



Main Task

- Investigate the current state of art of the European Digital Infrastructure
- Asses current and future needs for automated and autonomous mobility
- Identify demands for digital infrastructure to support CAD
- Elaborate links between TM2.0, digital infrastructure and related services
- Understand how related data services can be used for optimizing traffic management and planning
- Provide recommendations for public authorities and stakeholders

Scope

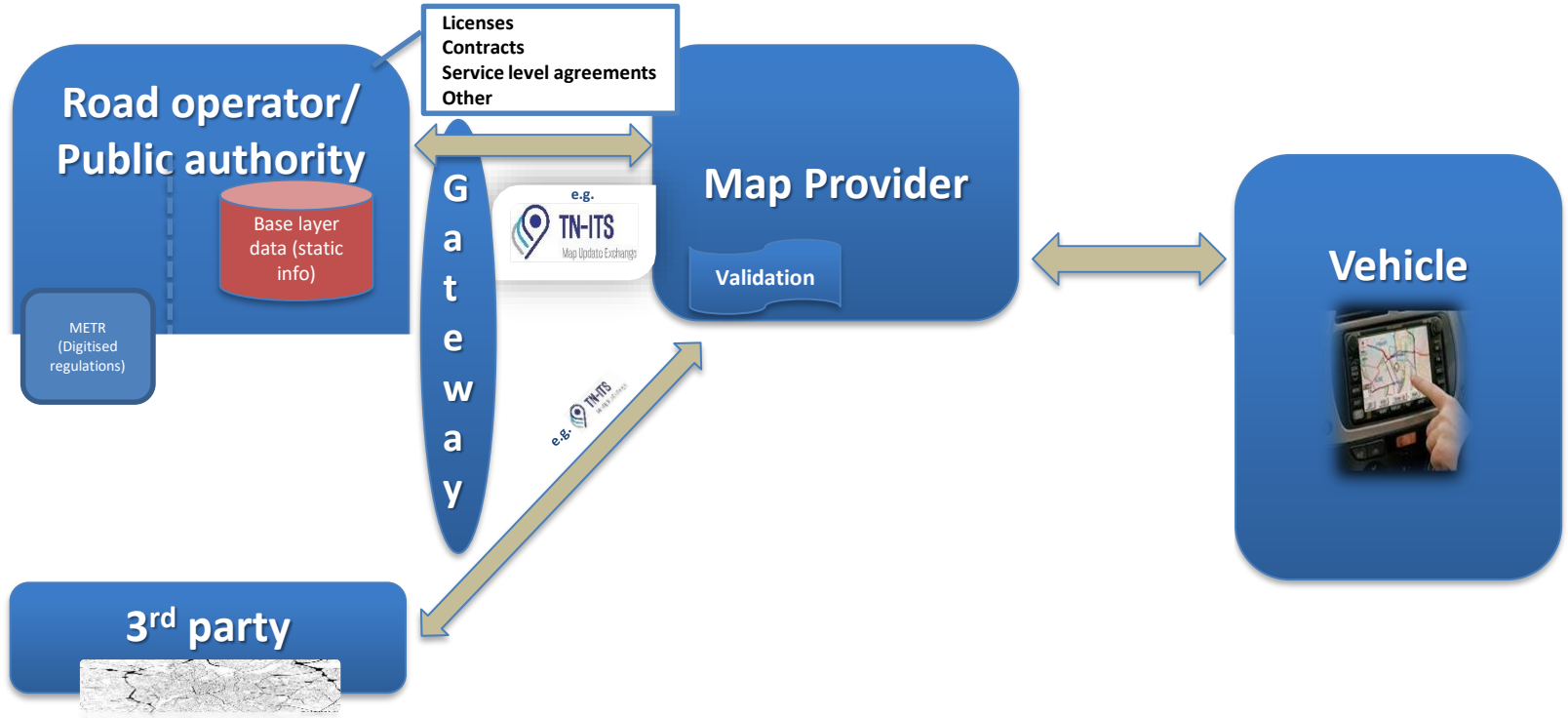
1. Introduction/Background
2. Assessment of the present digital infrastructure:
 - Maps
 - Data
 - System architectures
 - Governance/Regulation
 - Harmonization/Standards/Interoperability
3. Towards a future digital infrastructure ecosystem
 - CAD Roadmap EC
4. Recommendations for future steps

TM2.0 Digital infrastructure context



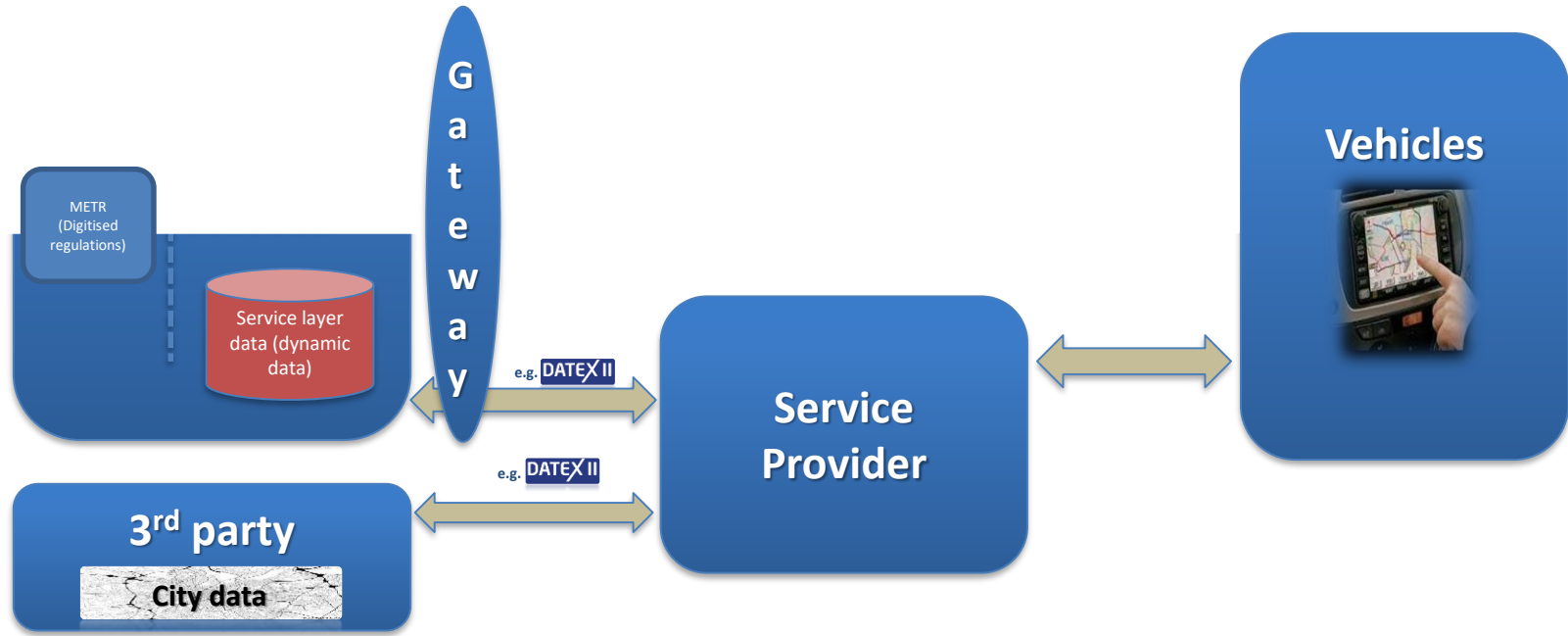
Context 1

Base layer data and service provisioning



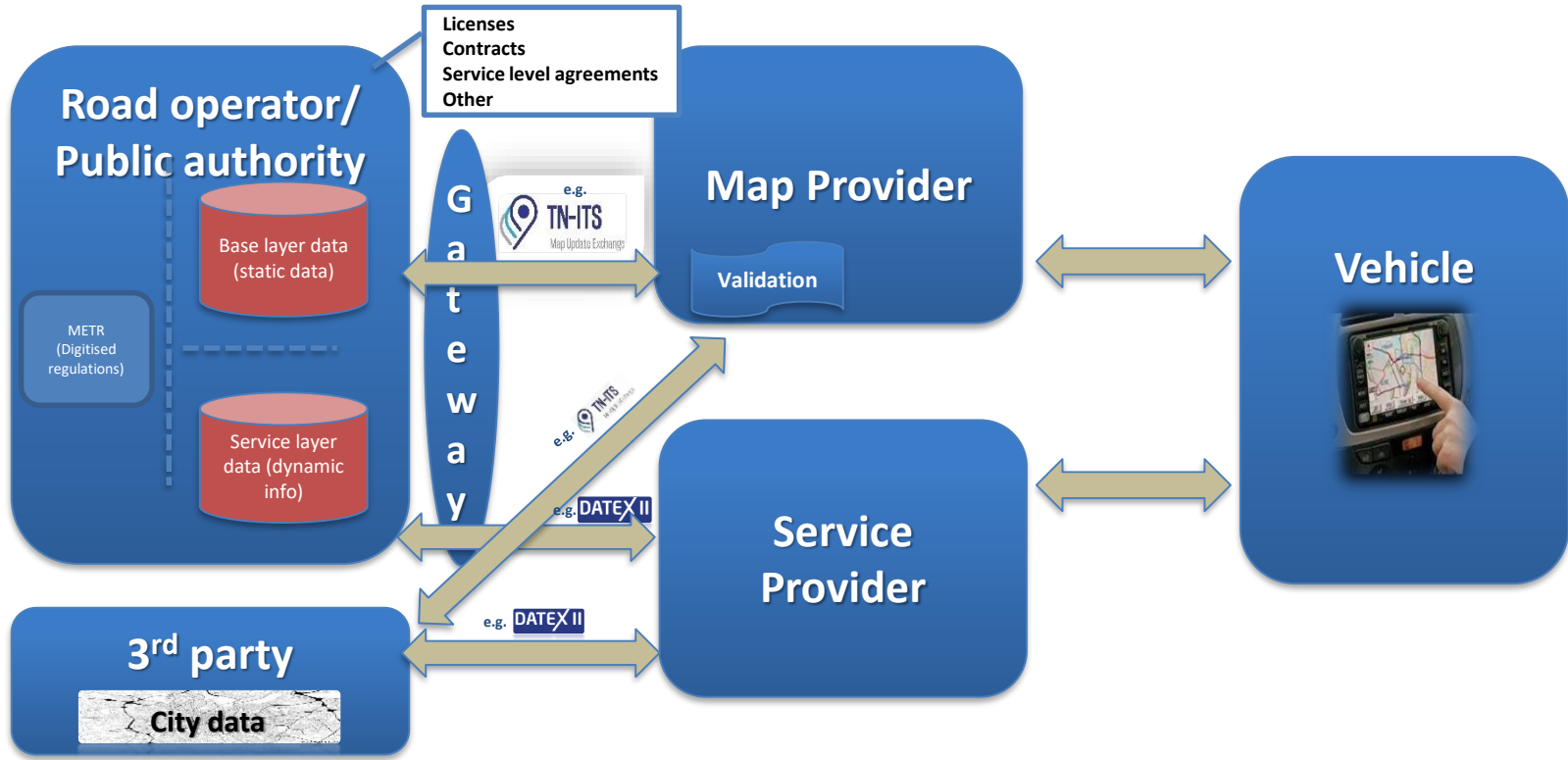
Gateway: e.g. NAP or other body

Context 2: Service layer data and provisioning



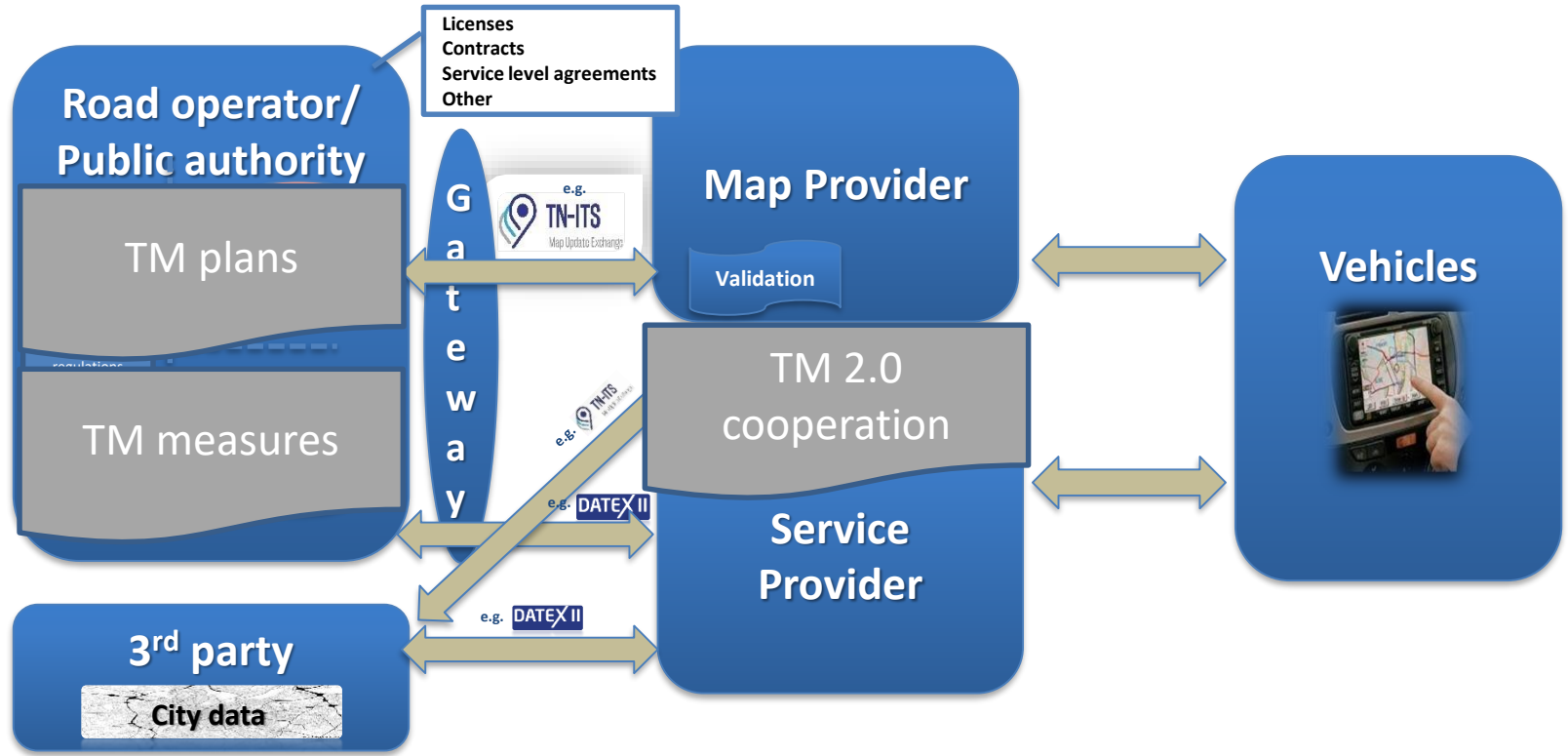
Gateway: e.g. NAP or other

Combined context 1 & 2: TM 2.0: digital infrastructure context



Gateway: e.g. NAP or other

TM 2.0 roles:



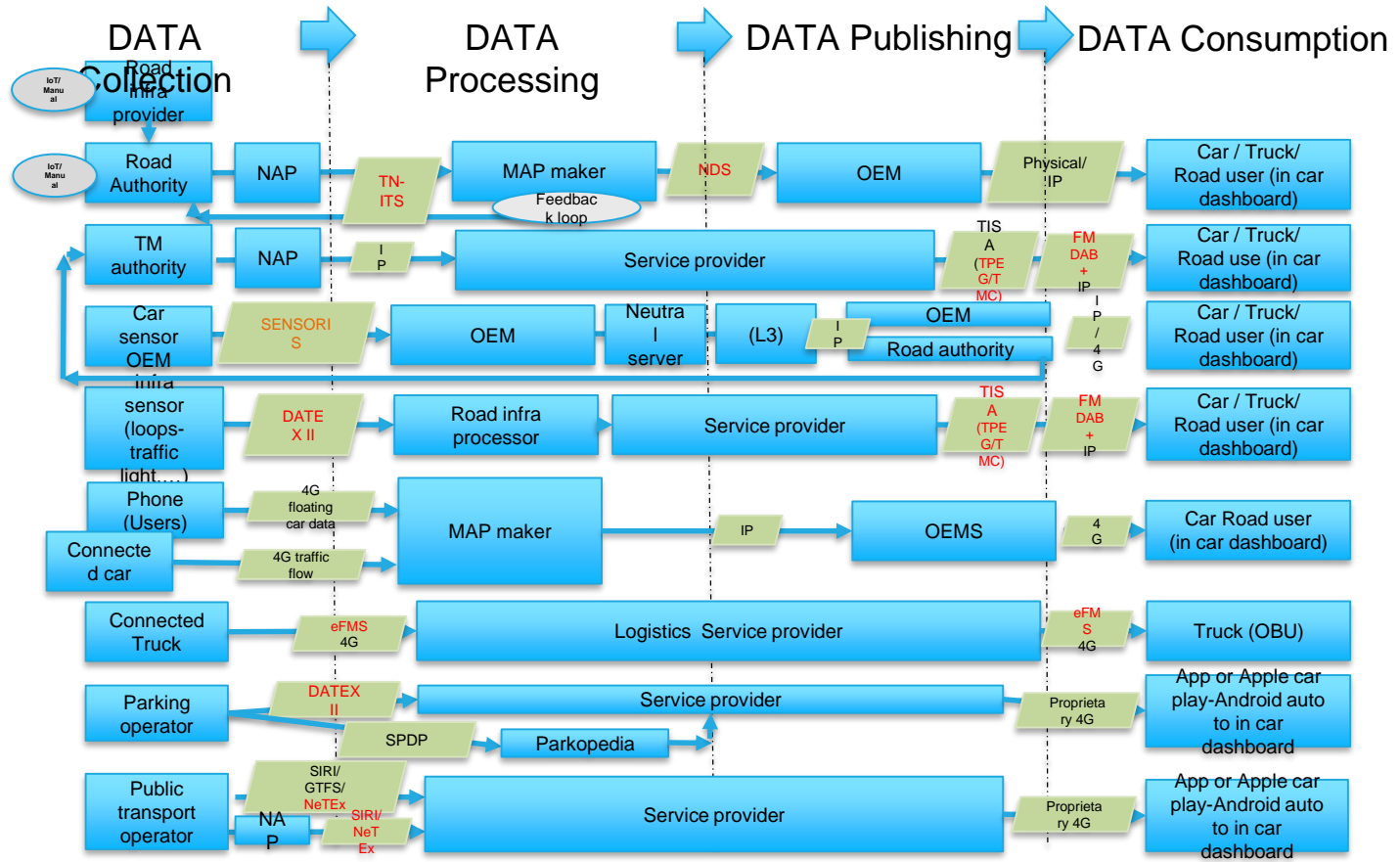
Gateway: e.g. NAP or other



TF Digital system architecture

A complete mobility data context

Slides from meeting Utrecht
2020-03-05



Back up



Structure more detailed (backup)

- Introduction/Background
 - CAD Roadmap EC, SAE Levels, ODD and ISAD, INFRAMIX – description of different Levels/Concept and relation
- Assessment of the present digital infrastructure (Stakeholder/Interaction):
- Maps
 - Base Layer
 - HD Maps
 - Local dynamic map (ETSI)
 - E-Horizon (HAD and dynamic)
- Data
 - Dynamic Data
 - Third party data (OEM, traffic flow, sensor)
 - Traffic Services (public/private)
 - Multimodal Data

Structure more detailed (backup)

- System architecture
 - Connectivity
 - NAPS
 - OEM Clouds
 - Service Provider Clouds
 - Physical infrastructure - digitally enabled (i. e. VMS)
 - Traffic Management Center
 - Cooperation (Data Task Force)
- Governance/Regulation
 - Legally binding of Information
 - Governance
 - (Negotiating right of way) – role of infrastructure

Structure more detailed (backup)

- Harmonization/Standards/Interoperability
 - Location Referencing
 - Data Standards (DATEX, SENSORIS, TN-ITS, NDS, etc.)
 - Communication Standards/protocols
- Towards a future digital infrastructure ecosystem
- CAD Roadmap EC
 - Day1
 - Day2
 - Day3
 - Day4
- (taking INFRAMIX, ISAD SAE-levels and ODD in account)
- Recommendations for future steps