



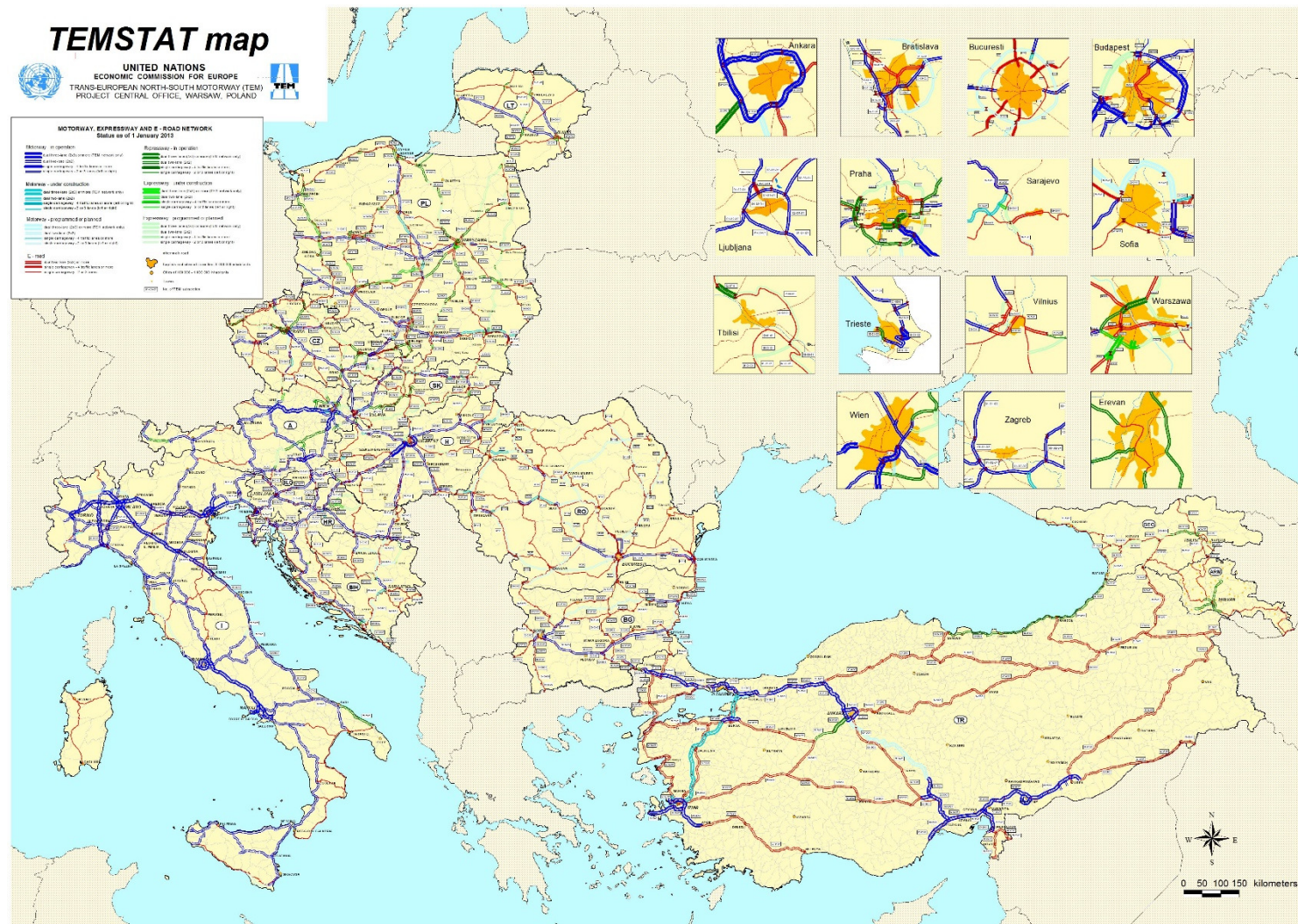
TRANS-EUROPEAN NORTH-SOUTH MOTORWAY PROJECT (TEM)

COMPLETING NETWORK – IMPROVING MANAGEMENT – RESPONDING TO TRENDS

UNIQUE PLATFORM FOR ROAD INFRASTRUCTURE PROVIDERS, MANAGERS AND OPERATORS

DECEMBER 2018

Who we are



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Why we were established



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How we do so

PROJECTS and ACTIVITIES UP TO 2021

Standards:

- Safety standards in work zones
- Development of a standard catalogue of public services in terms of road infrastructure
- Standards for road equipment for the protection of the environment

Cooperation with partners:

- UN Regional Commissions, Specialized Agencies, Programs and Funds, Departments and Offices
- Highways Engineering Exchange Program, IRF, OECD ITF, PIARC, CEDR
- UNECE (i.e.: WP.5, SC.1, WP.1, WP.29, WP.6)

Evaluation of effectiveness and efficiency:

- road safety infrastructural means
- solutions for the protection of the environment
- tolling systems

Internal business processes:

- Data collection, measurement and dissemination processes for road operators
- Alternative methods of energy production in the management of road infrastructure
- Building Information Modeling for road operators



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Areas of interest

TEM Project Strategic Objectives

- ✓ Facilitating road traffic in Europe
- ✓ Improving the quality and efficiency of transport operations in UN ECE region
- ✓ Balancing existing gaps and disparities between motorway networks in Western, Eastern, Central and South-Eastern Europe
- ✓ Assisting the integration process of European transport infrastructure systems

NETWORK

ANALYSIS AND PROJECTS COORDINATION

OPERATIONAL PROFICIENCY

BUSINESS PROCESSES IMPROVEMENT

TRENDS

UNDERSTANDING AND RESPONSE



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Network

LEGACY:

- TEM Master Plan has been prepared in 2006 and revised in 2011;
- It contains revised list of priority projects of TEM backbone network;
- The expected status of the network in 2020 is also projected.

CURRENT PROJECT:

- **TEM Network Report** has been scheduled to be prepared in 2018;
- It will examine progress of network development;
- Transport growth and transport needs in terms of road infrastructure will be presented;
- Road safety has been taken into consideration, as well as
- Border crossings as probable bottle necks on the network



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Network

TEM Network Report – objectives of the report

- Presentation of TEM Network in one coherent document
- TEM Network Report is a continuation of TEMSTAT activities of TEM Project
- TEM Network Report constitute continual monitoring system
- Report presents data in terms of network readiness, plans for development, road safety, border crossings and general transport information. This document can be treated as an attempt of revision of TEM Masterplan from 2011
- Report will establish a stable set of data allowing to monitor trends and identify changes in development and future of TEM road network
- Excellent source of data and information for governments, National Road Administrations and any interested parties in road and infrastructure sector which can be used for network planning
- 2018 edition comprise also wider range of data - whole road network of TEM member countries to have clear view regarding development of road networks in last years



Network

TEM Network Report



1. Economic data:

- Transport growth evolution in TEM countries
- Trade exchange flows by transport mode (% by tkm) in TEM countries
- Employment by transport mode in TEM countries
- Gross investments spending in road infrastructure in TEM countries
- Maintenance expenditures in road infrastructure in TEM countries
- Registered vehicles by type of vehicles in TEM countries

2. Structure of the national TEM Members network

- Road Network data
 - Total road network (KM) and High Speed Roads
 - Dual and single carriage roads (tolled and not tolled) (KM)
 - Road network density by country (km roads/km² land area)
 - Traffic density by country AADT
- General Transport Data
 - Road passenger and goods transport (pkm+tkm)
- Road Safety

3. Structure of TEM Network

- Road type present and planned
- Number of lanes present and planned
- Sections:
 - In operation, under construction, planned/programmed
 - Years of construction
 - Estimated costs
- AADT volume
- Accidents and fatalities

4. Border Crossings of TEM Network

- Roads
- Average Time
- Services
- Number of HGV
- AADT



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Sources of data



- Eurostat
- UNECE Statistical Database
- OECD Stat
- World Bank
- WP6 UNECE
- OECD ITF



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Modal Split of inland freight transport, 2015 (% of total tkm)

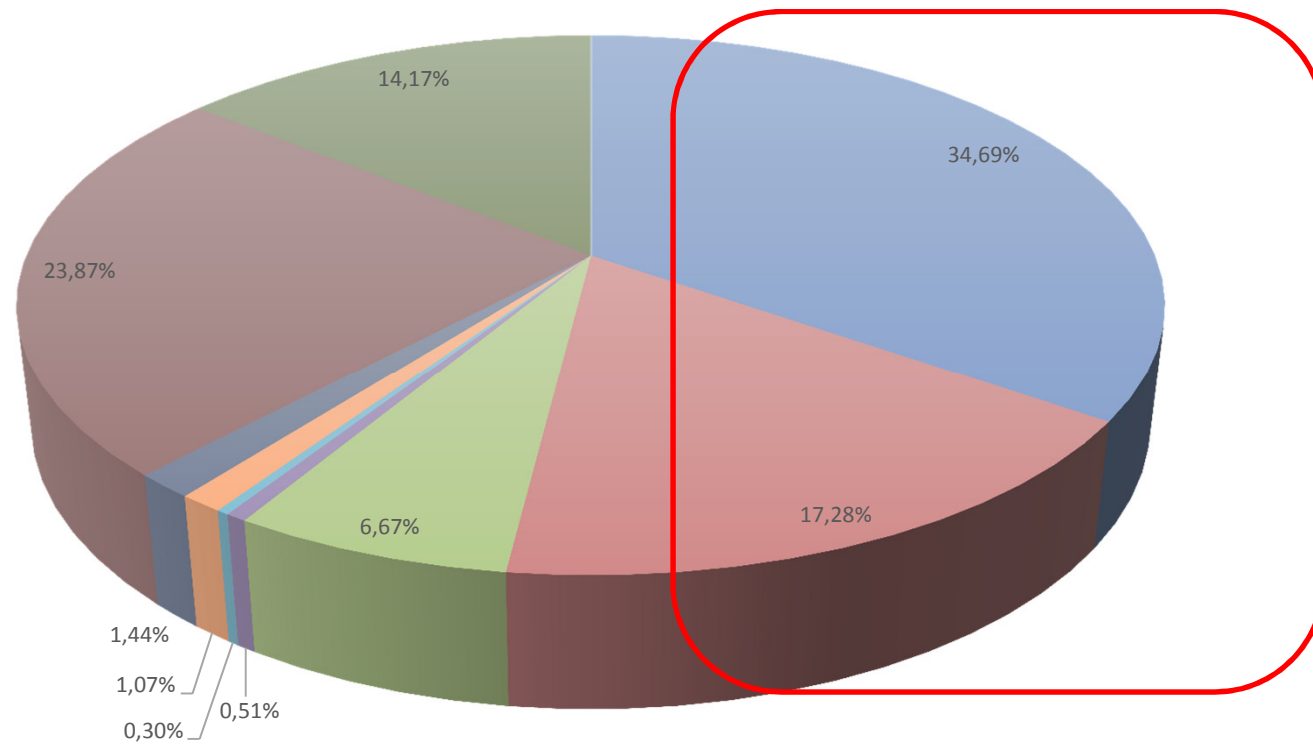


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Source: Eurostat (online data code : rail_go_typeall (rail), iww_go_atygo (inland waterways), road_go_ta_tot (national road transport), road_go_ca_c (road cabotage transport) and Eurostat computations (international road transport)).

Employment by mode of transport



- | | | |
|--------------------------|--------------------------------------|---------------------------------|
| ■ Road Freight transport | ■ Road passenger transport | ■ Railways |
| ■ Pipelines | ■ Inland water transport | ■ Sea Transport |
| ■ Air transport | ■ Warehousing and support activities | ■ Postal and courier activities |

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Operational proficiency

PROVIDE SAFETY

INCREASE UTILITY

**DECREASE TOTAL
COST**

**INCREASE LIFETIME
VALUE**

**FUNDING,
CAPABILITIES,
GOVERNANCE**

PROJECTS DELIVERED:

- RSA and RSI on the TEM Network

CURRENT PROJECTS:

- Maintenance standards for roads and highways
- Governing and funding of road infrastructure
- Benchmarking of Transport Infrastructure Construction Costs

LEGACY:

- TEM Standards and Recommended Practice (design, construction, maintenance)



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Operational proficiency

REPORT: Governing and funding of road infrastructure



1. Road sub-sector's goals and public services

- Governance and public services according to the UN System understanding
- the goals and services for road authorities, taking into consideration literature review and international best practice
- Generic Balanced Scorecard for road authority

2. Governance and organization of the road sub-sector:

- Roles and responsibilities of ministries, agencies and organizations
- Legal forms of these organizations
- Supply chain organization
- Private Sector involvement

3. Capabilities of the road sub-sector:

- Asset management maturity and strategy
- Data collection and management
- Planning and programming processes
- Performance measurement

Permanent workgroup with iHEEP on Asset Management

4. Funding strategies and PPP Projects:

- Funding sources
- Governance of funding
- Debt financing
- Road expenditures
- Preparation and management of PPP projects

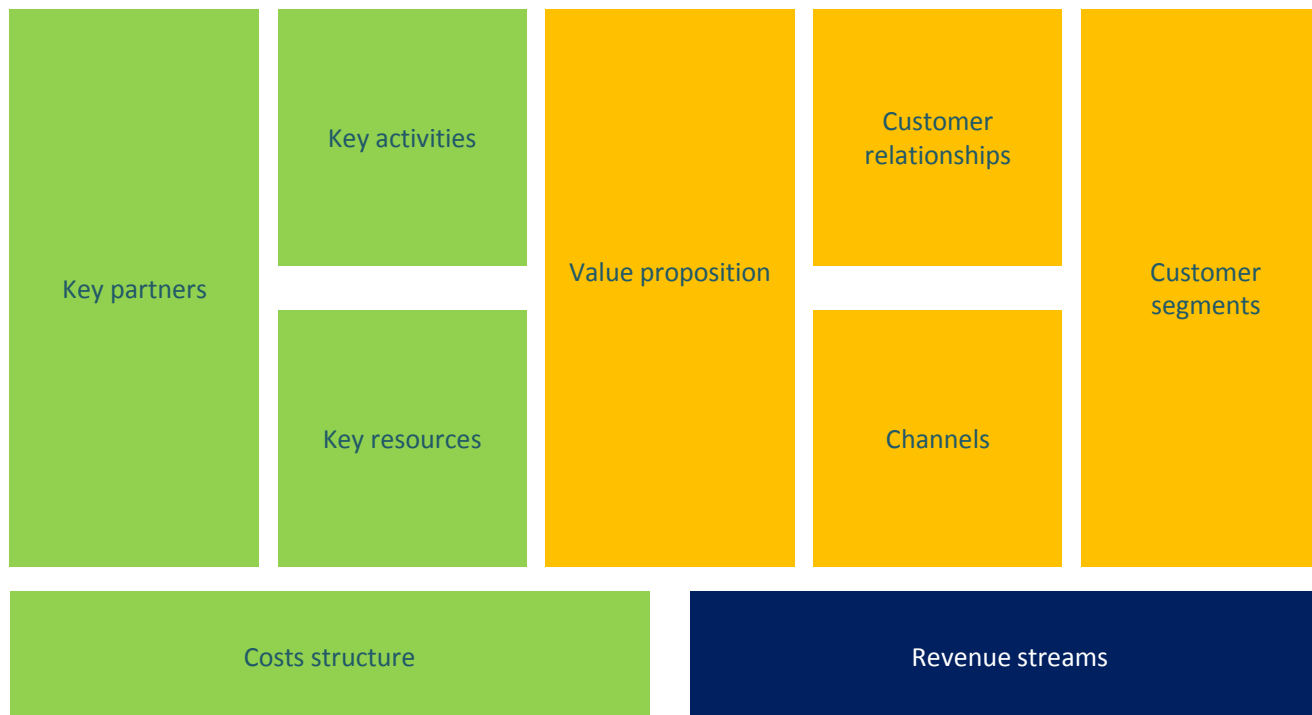


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Business Model approach

Common denominator



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Chapter A

Road sub-sector's goals and public services

- Customer expectations:
 - Customer orientation as a primary driver of organizational performance
 - The value creation process which support customer orientation
 - Reliable and safe infrastructure for mobility operations
- Road infrastructure value proposition:
 - Asset management
 - Traffic management
- Requirements for governance:
 - Responsive
 - Accountable
 - Understanding the customer
 - Building capacity
 - Service delivery
 - Continual improvement



Chapter A

Road sub-sector's goals and public services

■ Implementation strategies

Increase utility	Maximize asset utilization	Enhance peak capacity and effective throughput	Apply demand management	Optimize availability/reduce downtime
	Enhance quality for users	Adopt customer-centric operating model	Enhance the end-to-end user experience	Use smart technologies to refine user performance
Decrease total cost	Reduce O&M costs	Implement lean and automated processes	Optimize procurement costs and outsourcing	Right size management and support functions
	Mitigate externalities	Arrange comprehensive sustainability: Health, Safety, Environment	Embed sustainability: Health, Safety, Environment routine	Cooperate with relevant stakeholders
Increase lifetime value	Extend asset life	Invest in preventive maintenance	Control excessive asset consumption and stress	Enhance resilience
	Reinvest with a life cycle view	Prioritize project options with whole life cycle CBA	Select contracting mode for best value for money	Prepare for efficient project delivery
Enable O&M best practice	Ensure funding	Dedicate user taxes via maintenance funds	Apply inclusive user charges	Capture ancillary business
	Build capabilities	Introduce asset management planning	Apply data benchmarks and tools	Conduct training and develop talents
	Reform governance	Corporatize and professionalize public agencies	Foster cooperation between agencies	Consider private Sector participation and competition

Source: WEF



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Chapter B

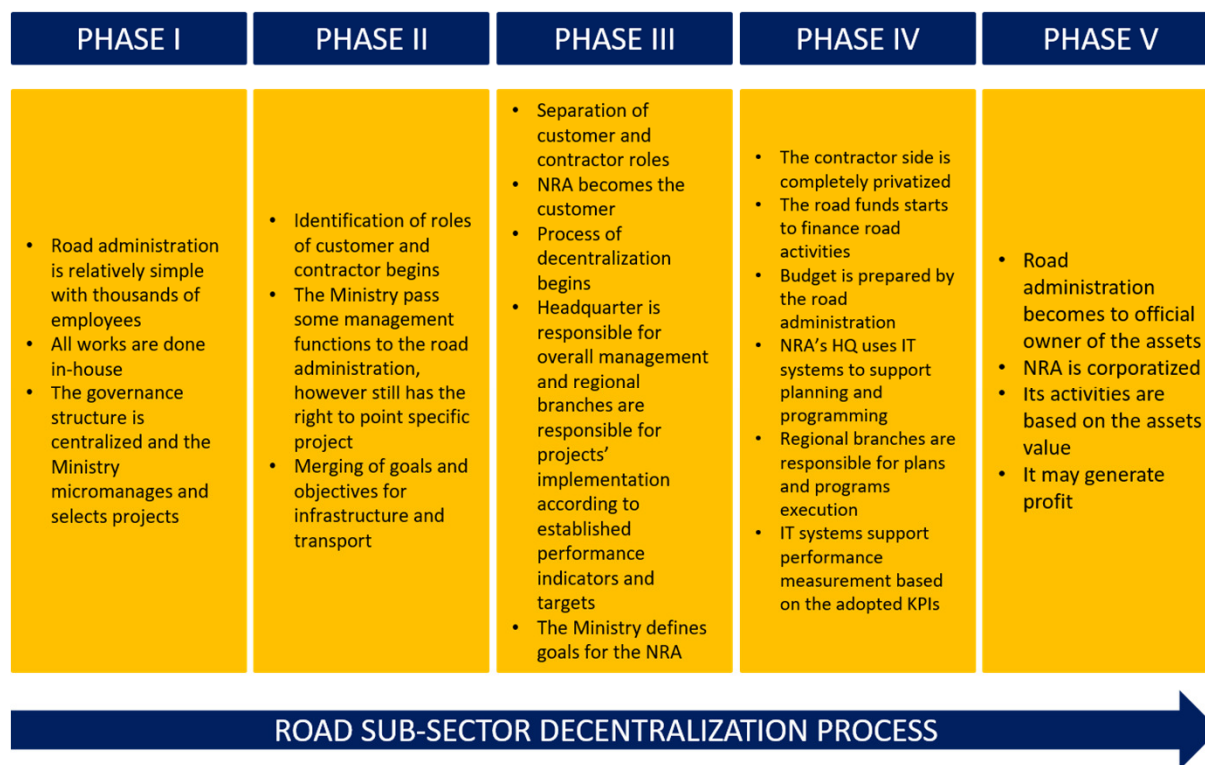
Governance within the road sub-sector

Stage of development	Birth	Growth	Upgrading	Maturity
Organization	Large public works department	Separation of client and service deliverer	Road agency/ administration/ board	"Commercial" roads
Management systems	Maintenance management	Accounting, road inventory, traffic, and road condition	Financial management, information management, road asset, and performance management (road smoothness, capacity, safety)	Financial management, transportation modeling
Management skills	Resource mobilization	Management of contractual relationships and relationships with state level issues	"Commercial" management, reorganization management and management of relationships with community issues	Management of modal integration and wider issues, management of consultation and probity
Technical skills	Basic engineering, maintenance workforce management	Highway engineering; road asset management; planning, programming, and prioritization of road activities; contract management	Use of performance indicators, economic analysis, environmental/ social analysis	Transport system performance, planning, financial analysis, information technology, traffic demand management
Private sector involvement	Low	Some consulting/ contracting	Design, construction, maintenance, road management, and financing	Long-term performance specified maintenance and public-private partnerships



Chapter B

Governance within the road sub-sector



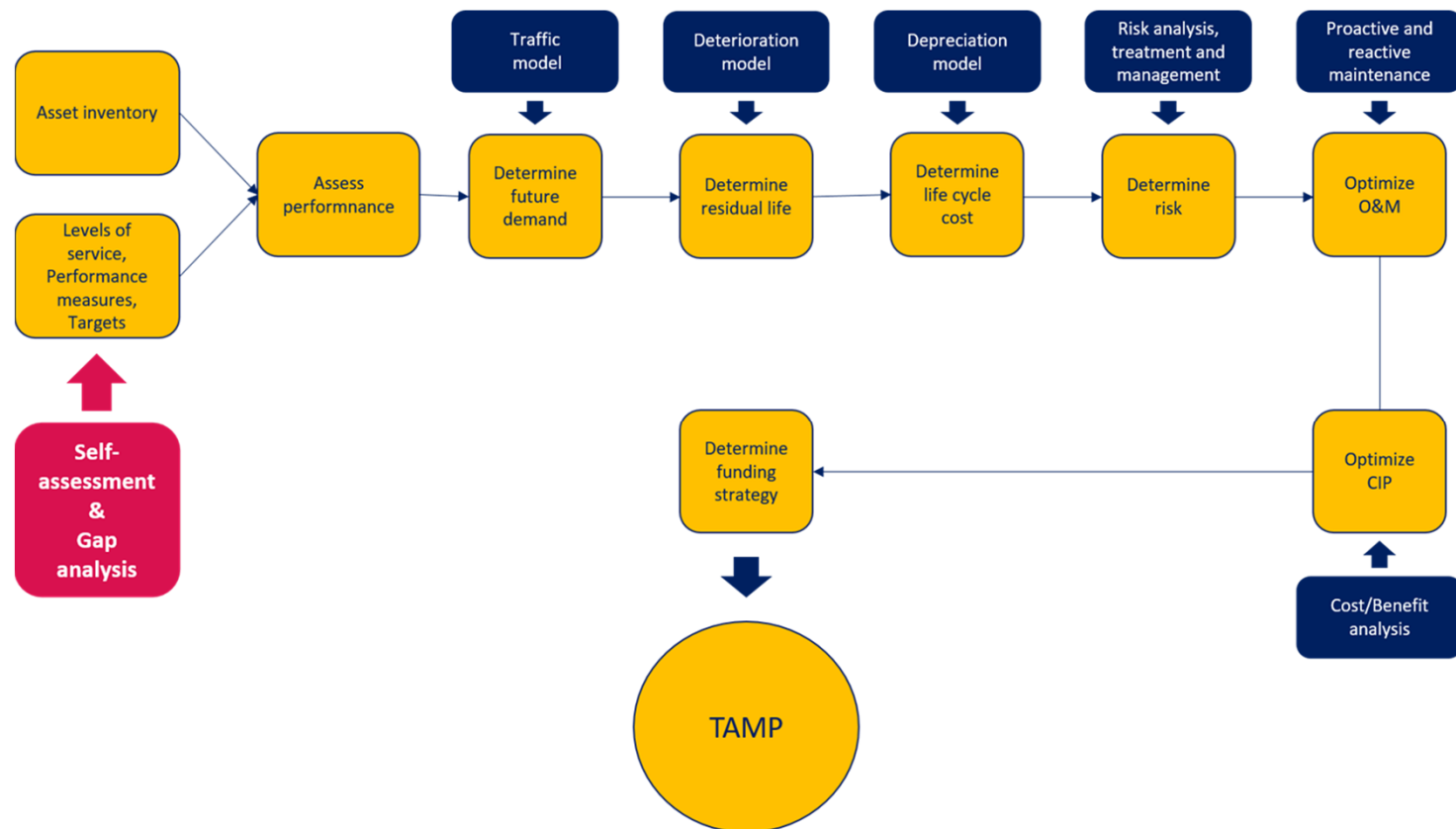
Source: WB



Chapter C

Capabilities of the road authorities

- AMP as business process



Chapter C

Capabilities of the road authorities



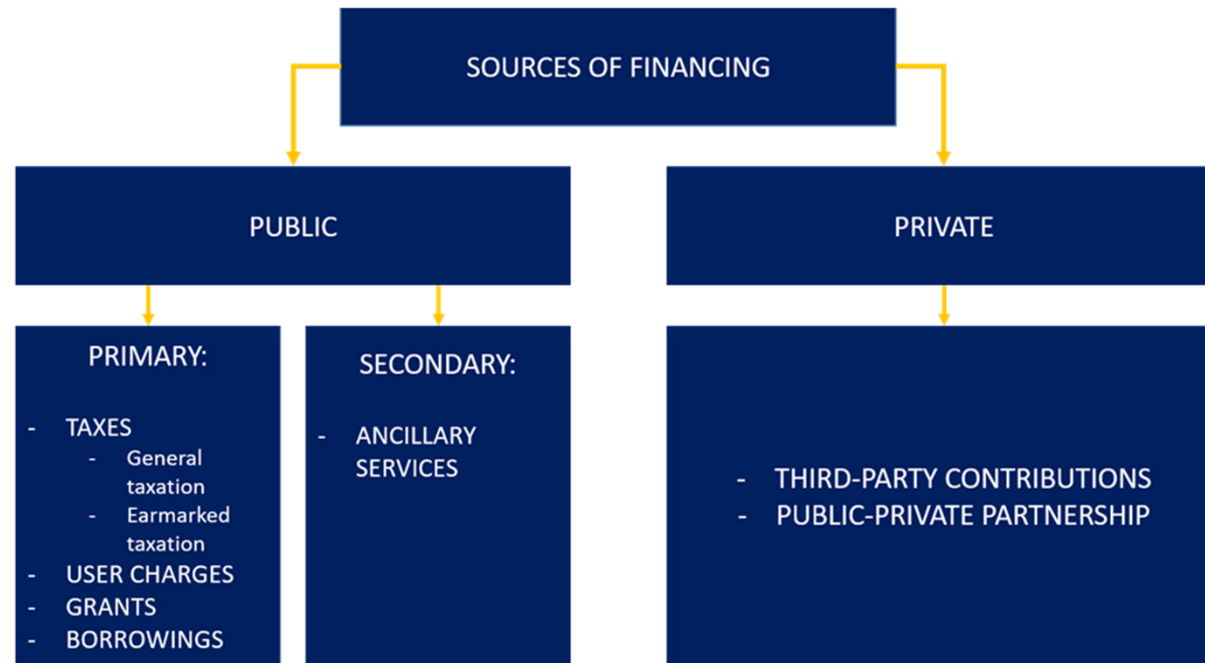
Three main outcomes	AMP business process	Five core questions	AASHTO areas	
Self-assessment & Gap analysis				
PERFORMANCE ASSESSMENT	Develop asset inventory	What is the current state of my assets?	SERVICE PLANNING	TRANSPORTATION ASSET MANAGEMENT INFORMATION SYSTEMS (TAMIS)
	Establish levels of service, performance measures and targets	What is my required level of service?		
	Asses condition and performance			
OPTIMIZATION OF DECISION MAKING	Determine future demand	Which assets are critical?	LIFE CYCLE MANAGEMENT AND ASSET PRESERVATION	
	Determine residual life			
	Determine life cycle costs			
	Determine risk treatment and management	What is my best O&M and CIP investment strategy?		
	Optimize operations and maintenance			
	Optimize capital investments			
FUNDING STRATEGY	Determine funding strategy	What is my best long term funding strategy?	PROGRAM PLANNING AND TAMP	
	Build TAMP with financial plan			



Chapter D

Financing and public-private partnership

■ Financing sources and instruments



Source: UNECE



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Chapter D

Financing



Category	Funding mechanism	Characteristics
All purpose taxes	General taxes	Charges applied to salaries, goods and services purchase, companies' incomes etc. Sometimes earmarked to specific road funds
Special purpose road user taxes and fines	Vehicle taxes	Payments per vehicle depending on vehicle characteristics on a one-off and on an annual basis
	Fuel taxes	Payments applied to the oil and diesel products that are consumed by the vehicle
	Green taxes	The charge depends on the distance driven and/or the pollutant emissions features of the vehicle
	Fines	Charges from law violations
Road user charges	Distance based	Payments are applied strictly to the distance travelled
	Time based	Payments based on the amount of time that the infrastructure is available
	Road pricing	Charges applied to users within a certain area (for i.e. demand management)
	International transit fees	Transit charges (i.e. taking into account distance, quantity of goods)
Development cost charges	Commercial areas access contribution	Payments imposed to new commercial areas where the infrastructure has been developed
	Urban development contribution	Payments imposed to municipalities where the infrastructure has been developed
Grants		Non-repayable funds disbursed by one party.
Private financing	PPP	Obtaining financing by private organizations from commercial financing institutions to be invested in public infrastructure
	Donations	Individuals or organization who help to maintain roads



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Source: CEDR

Chapter D

Financing and public-private partnership



Category	Work & service contract (traditional procurement)		Public-Private Partnership				Privatization
Type	Design, Build	Design & Build	Management contracts	Performance-Based Contracts (PBC)	Lease, Affermage (Brownfield)	BOT, DBFO, BOO (Greenfield)	
Design	Private by fee contract					Private by concession contract	Private
Build							
O&M	Public	Public	Private by fee contract	Private by fee contract	Private by concession contract		
Finance	Public	Public	Public	Public			
Own	Public	Public	Public	Public	Public	Public (BOT/DBFO) or Private (BOO)	
Private sector revenue options					Tolls		
				Availability payments			
				Government guarantees			
				Other support (i.e. insurance)			

Source: PPIAF Toolkit for PPP in Roads and Highways



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Trends



Trends in economy and transportation

- Alternative fuels
- Sharing-economy
- Automation



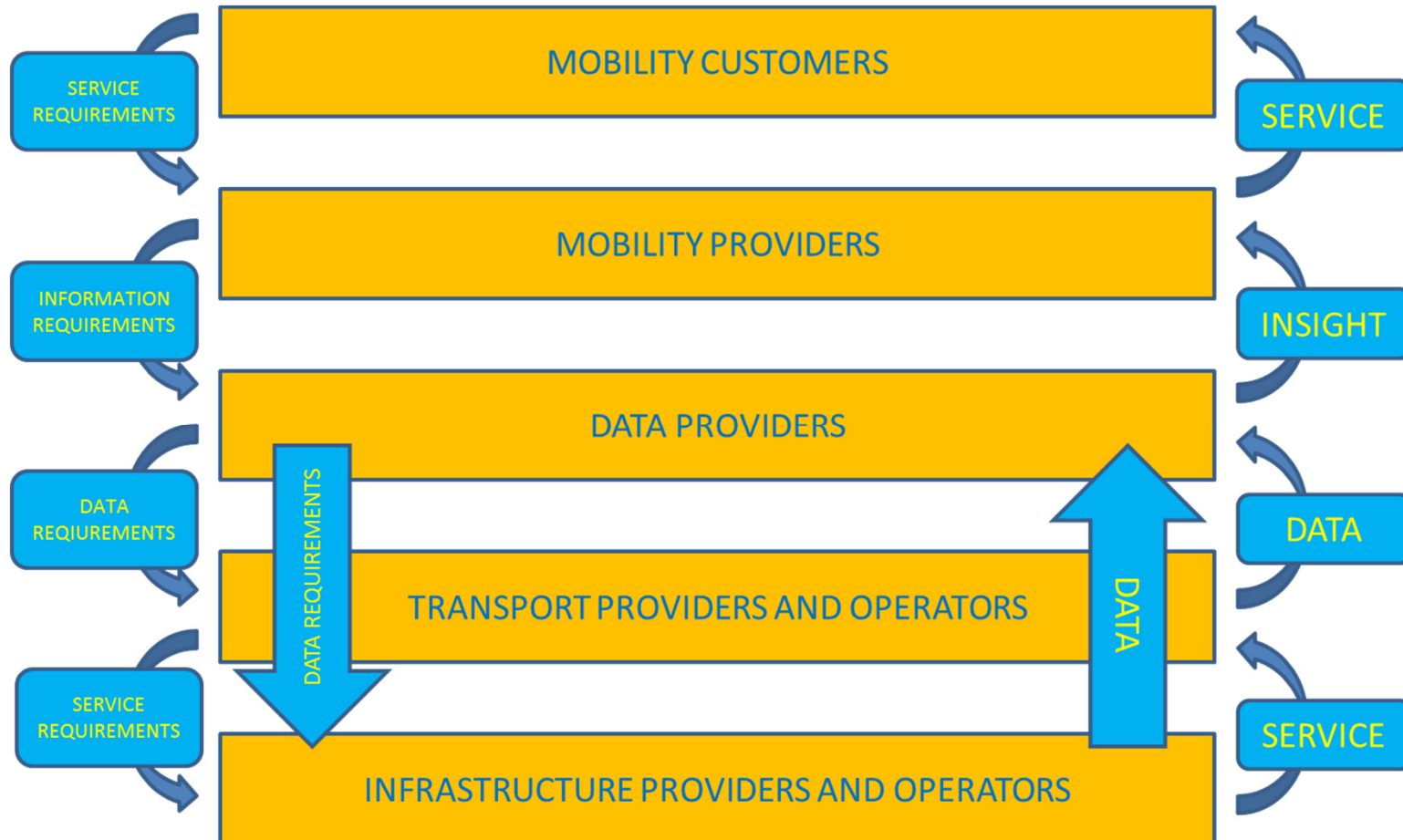
Road operators response in terms of:

- Self-explaining roads
- Well-maintained roads and signs
- Road traffic information
- Data collection and sharing
- New digital infrastructure
- Safety and security policies and procedures



Trends

Report about Mobility as a Service





Report: Mobility as a Service

Role of infrastructure provider

- Part 1: Generic services and value proposition of infrastructure providers
 - Definition of current situation
 - Requirements for improvement concerning:
 - Customer perspective
 - Internal business perspective
 - Learn and growth perspective
- Part 2: Current trends in transportation and a role of infrastructure providers and operators in mobility supply chain
 - Trends definition:
 - Electrification
 - Sharing economy
 - Automation
 - Requirements, brought by mentioned above trends in transportation, will be investigated with a special focus on the possible and/or expected roles of the infrastructure operator in the mobility supply chain
- Part 3: Identification of new business processes and needs for re-engineering of existing business processes of infrastructure providers and operators
 - Impact of the mobility requirements, on the existing business processes, will be investigated
 - Possible new business processes will be suggested in line with learning and growth perspective.



Conclusions



UNIQUE PLATFORM FOR ROAD INFRASTRUCTURE PROVIDERS AND OPERATORS

NETWORK IMPROVEMENT

WHICH SECTIONS AND SERVICES EXIST
WHICH ARE MISSING
WHEN EXPECTED

OPERATIONAL PROFICIENCY

HOW TO ENHANCE EFFECTIVENESS AND EFFICIENCY
WITHIN ROAD SUB-SECTOR

TRENDS RESPONSE

CONTRIBUTION TO MOBILITY SUPPLY CHAIN
IMPACT ON THE ROAD INFRASTRUCTURE PROVIDERS
NEW BUSINESS PROCESSES



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Thank you for your attention

Do not wait any longer. Join us!😊

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