Taking stock…
Moving on from the ERTRAC Urban Mobility Roadmap

ERTRAC/EGVIA urban mobility workshop
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Urban mobility: key part of the ERTRAC Vision

ERTRAC VISION: ENSURE MOBILITY IN URBAN AREAS

RESEARCH TOPICS 2020-2030:

- **Understanding the changes in cities:** interactions between land use, transport, technologies and users

- **Simulation, planning tools and assessment methods** to support evidence-based decision-making

ENSURE MOBILITY IN URBAN AREAS

RESEARCH TOPICS 2020-2030:

- **Tools and roll-out** of integrated pro-active demand-responsive road transport **network management**

- **Interchange infrastructures** and services for smart and seamless intermodality

- New sustainable and smart ways of **delivering goods** to make better use of **urban space**

- Requirements and concepts for new **vehicles for urban use**

Integrated Urban mobility Roadmap 2017
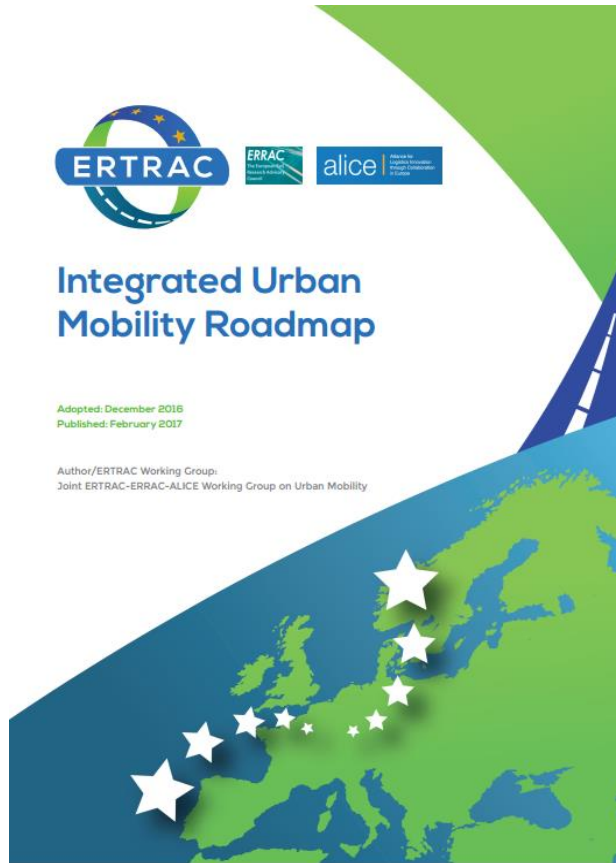
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Urban Mobility: Roadmap 2017

Integrated Urban Mobility Roadmap

Adopted: December 2016
Published: February 2017

Author/ERTRAC Working Group:
Joint ERTRAC-ERRAC-ALICE Working Group on Urban Mobility

- Addressing the **entire urban mobility system:** all types of urban transport users, vehicles, modes, infrastructures and services, in line with urban planning (urban space issues)
- ➢**Objective of Systems Integration**

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- Addressing the **entire urban mobility system:** all types of urban transport users, vehicles, modes, infrastructures and services, in line with urban planning (urban space issues)
- ➢ **Objective of Systems Integration**

Which major challenges affect urban mobility?

- Air quality
- Carbon footprint (energy use)
- City dynamics
- Pressure on availability of space and congestion

Which major trends influence urban mobility?

- Demographic changes
- Sharing economy
- Digitalisation (incl. automation)

Governance, regulation business models

SUMPs

Big data and modelling tools
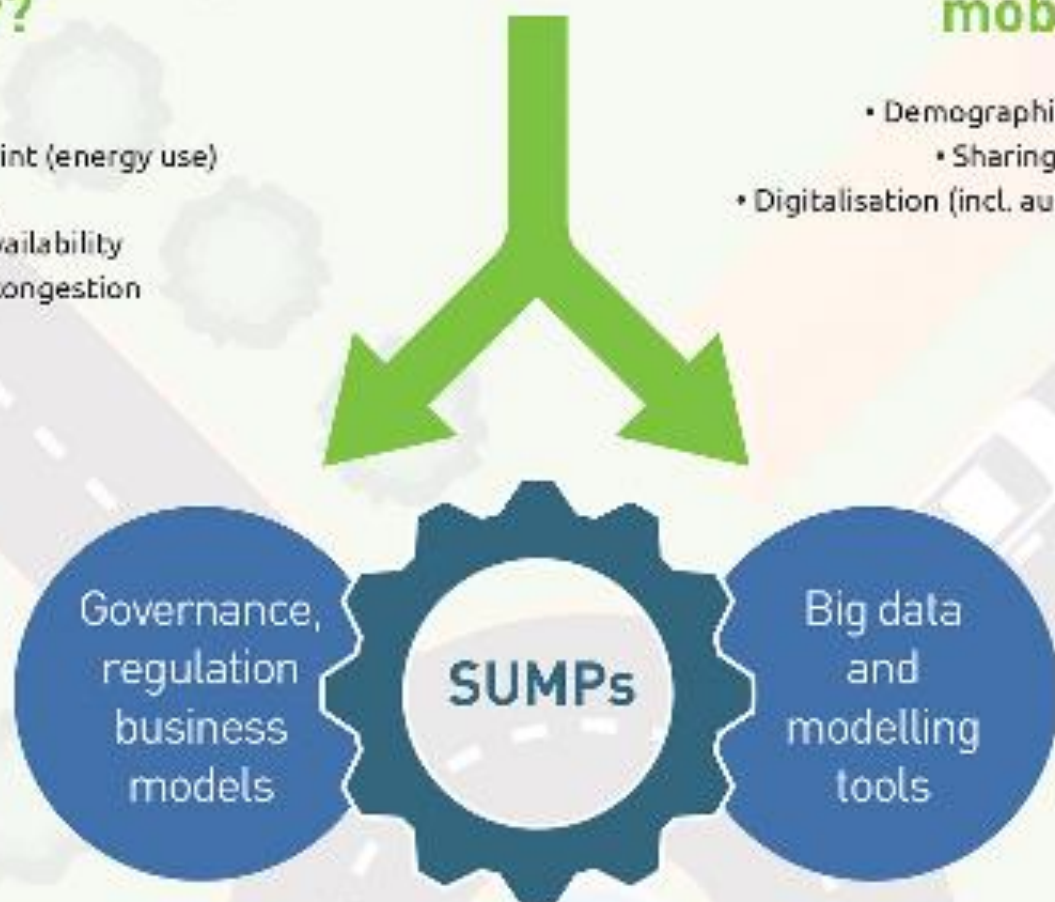
Management

Management related solutions
- Demand management
- Integrated urban mobility and network management
- Integrating urban mobility within overall European transport chains

Services

Service related solutions
- Integrated information
- Integrated payment
- Integrating urban freight and passenger mobility

Infrastructure

Infrastructure related solutions
- Land use and transport interactions
- Smart interchanges
- Optimised use of infrastructures

Modal solutions

Modal solutions
- Clean fuels and vehicles
- Active and light travel modes

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Urban Mobility Roadmap (UMRM)

- **3** Scopes and **20** specific research topics and priorities for both passengers and goods in urban context

1. Changing Societal trends

1.1 Decarbonisation

1.2 City dynamics

1.3 Digital society

1.4 Sharing economy

1.5 Automation

2. Framework/Enablers

2.1 SUMPs

2.2 Big data, modelling

2.3 Governance, regulation & business models

2.4 Transferability, capacity building & upscaling

3. Innovative urban mobility & services

3A. Infrastructure related solutions: 3 topics

3B. Management related solutions: 3 topics

3C. Service related solutions: 3 topics

3D. Modal solutions: 2 topics

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Mind the gap: what has been covered so far (Horizon 2020)?

Assessing Urban mobility road map coverage

Scope? (Thematic coverage) and/or Impact?

Assessing Urban mobility road map coverage

Single
Engaged
Divorced
☑ It's Complicated
Separated
In a Relationship
Married

Scope? (Thematic coverage) and/or Impact?

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Workflow

1 Category projects by 20 UM Roadmap topics

2 Classified by funding source

3 Identify 11 research gaps

4 Identify new priorities

Categorise projects by UM roadmap topics

65 projects – identified in the **UM WG meeting** (Rome 28.IX.2018)
218 projects found in TRIMIS (including national projects
403 projects found in CORDIS (not directly attributable to Urban Mobility) (Horizon2020/FP7)
➜**151** are related to Urban Mobility

332 projects – summarized by **VDI/VDE** (Dr. Frauke Bierau-Delpont)
    - 86 considered urban mobility relevant

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Summary of Projects related to UM-Roadmap

1. Changing Societal trends (55)

1.1 Decarbonisation (19)

1.2 City dynamics (10)

1.3 Digital society (9)

1.4 Sharing economy (7)

1.5 Automation (10)

2. Framework/Enablers (37)

2.1 SUPMs (8)

2.2 Big data, modelling (14)

2.3 Governance, regulation & business models (5)

2.4 Transferability, capacity building & upscaling (10)

3. Innovative urban mobility & services (87)

3A. Infrastructure related solutions (16)

3.1 Land use and transport interactions (6)

3.2 Interchanges (6)

3.3 Optimised use of infrastructure (4)

3B. Management related solutions (15)

3.4 Demand management (7)

3.5 Integrated urban mobility and network management (5)

3.6 Integrating UM with overall European transport chains (3)

3C. Service related solutions (23)

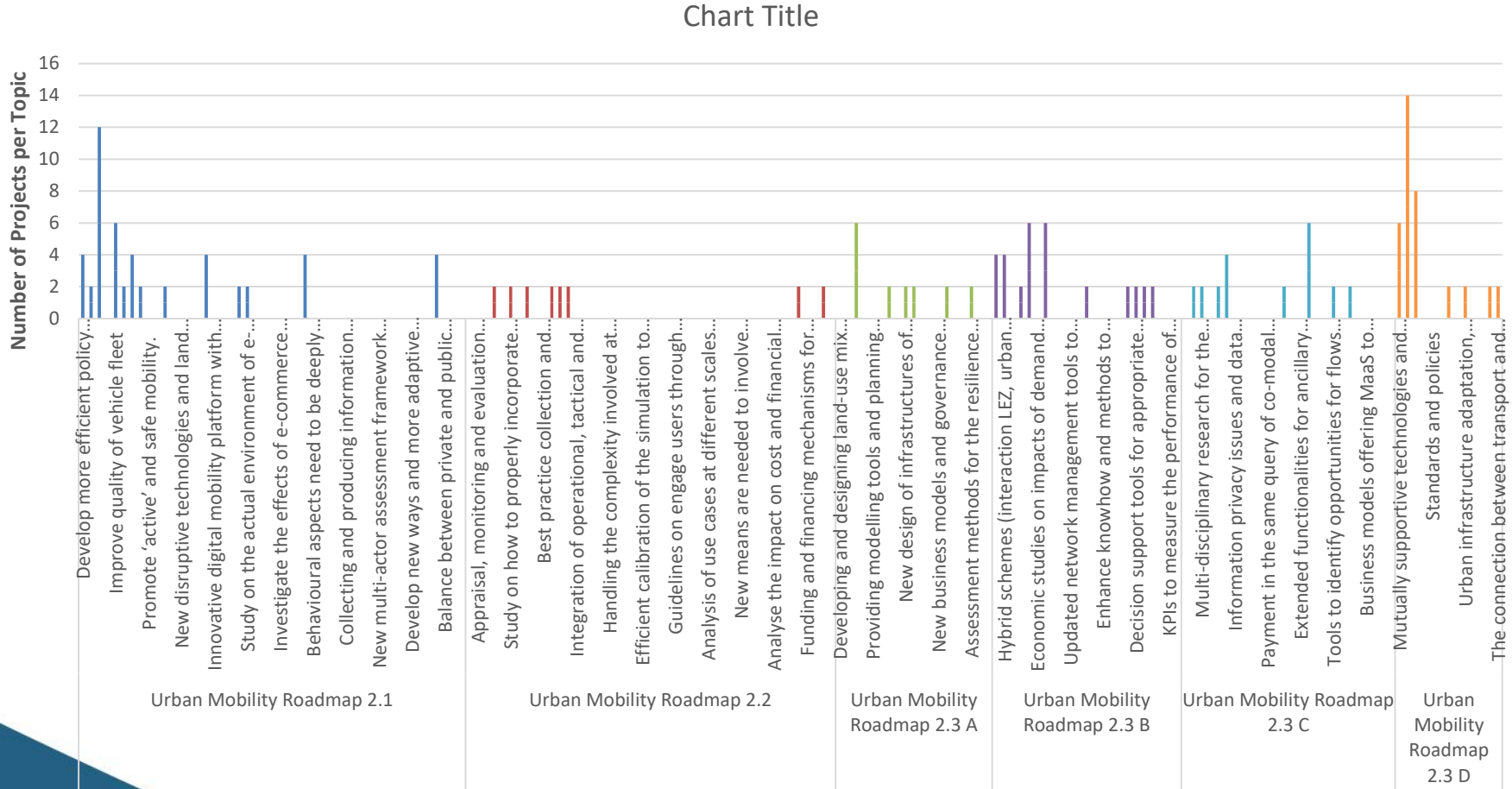3.7 Integrated information (5)

3.8 Integrated payment (2)

3.9 Urban freight and logistics (16)

3D. Modal solutions (33)

3.10 Clean fuels and vehicles (19)

3.11 Active and light travel modes (14)

Less studied
More studied

Chart Title

Number of Projects per Topic

Urban Mobility Roadmap 2.1 — Urban Mobility Roadmap 2.2 — Urban Mobility Roadmap 2.3 A — Urban Mobility Roadmap 2.3 B — Urban Mobility Roadmap 2.3 C — Urban Mobility Roadmap 2.3 D

Results from UMWG meeting June 2019

- Priority topics for research for Horizon Europe
  - Urban dimension of advanced **electrification** – Vehicle to Grid, electrification in context of the smart city, integration with electric PT
  - Quality of **space**: methods and tools to design and organize urban space at micro and meso level to accommodate mixed traffic (modal, connectivity), new services, modal interfaces; modelling and simulation tool and new solutions concepts
  - **Land use** – urban space and transport interaction (macro), relation with nature based solutions, and energy
  - **Data** for urban mobility planning: availability / accessibility for research / city planning, cross sectoral aspects
  - **New research and innovation methods** , based on new organisational structures – co-creation/partnerships (pilots and demonstrations)

Results from WG meeting June 2019

- Towards a new roadmap on new mobility services
  - given new and rapid developments and potentially disruptive impact

Potential NMS to fill service gaps (remote/suburban/rural, off-peak, target groups) and complement existing supply	Data sharing approaches, types of data needed and from whom – international cooperation US, geofencing
New business and cooperation models	Dynamic space management
Equity issues	Algorithmic governance
Urban space management – reallocation of space - light mobility lanes	New tools for traffic management based on data sourcing
MaaS governance models	Traffic Management as a Service
Link with housing – housing mobility budget	Importance of pilots
User acceptance / modal shift / travel behaviour	Urban Air Mobility: energy efficiency of drones? Specific use cases
Transformation processes – disruption readiness – capacity building	…

Next steps

- Process outcomes of workshop to feed into New Mobility Services roadmap
  - How to move from research to deployment?
  - How to scale up innovation?
  - What technical, policy, socio-economic R&I is required to help shape the urban mobility ecosustem of tomorrow?
- Further work on priorities for Horizon Europe work programme
- Next WG meeting in December or early Spring, in view of best timing for next steps towards EC
- Join the Urban Mobility Working Group!

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Gaps: changing societal trends – new urban mobility scenarios

Assessment of impacts of new technological changes (digital society, e-commerce) on GHG and pollutant emissions

Promote 'active' and safe mobility.

Exploring the potential role of neighbourhood-based solutions and services.

Investigate the actual efficiency benefits of smart solutions using ITS and big data and to what extent they can replace infrastructure development.

New disruptive technologies and land use measures to control urban sprawl or to reduce the speed of urban sprawl, including increase attractiveness of existing urban area.

Require new assess methods to detect the re-urbanization, densification and shrinking processes

Possibility of sharing uses of urban land: shared parking for different activities along day/week days (offices, shopping, sports).

Innovative digital mobility platform with the support of government as third parties

New business models to address the challenges associated with future integrated urban mobility solutions.

Impact assessment on the decline of car ownership and emission reduction in relation to the implementation of MaaS.

Investigating the consumers' needs and expectations to e-commerce in relation to urban mobility as well as the behaviour of actors in retail, logistics and delivery be changed by e-commerce

Understand the dynamics behind the e-commerce.

Researches the influences of e-commerce on urban shape and land use including the changing demand for retail space and logistics areas

Investigate the effects of e-commerce differ in growing urban areas (densification) and in shrinking and marginalized areas

Understand the trends in e-commerce and provide initial ideas for solutions for the sustainable development of all urban supply systems.

Evaluation of impact of the e-commerce growth over logistics design aspects in urban planning and urban design.

Behavioural aspects need to be deeply studied and carefully tackled.

Legislation has to be produced with the deployment of new regulatory frameworks.

Deploy shared mobility solutions as part of intermodal systems.

New optimization and simulation tools should be provided.

Collecting and producing information and providing it to the users in an adequate and timely way. Generating KPI for sharing mobility services in terms of sustainability.

The articulation of the individual demands and expectations.

Truly, innovative, sustainable and long lasting forms of cooperation for urban logistics services

Truly, innovative, sustainable and long lasting business models for vehicles and fleet sharing and pooling, infrastructures and networks sharing

New multi-actor assessment framework able to evaluate safety, economic and financial sustainability, societal acceptance, operational efficiency, level of innovation, labour and environmental impacts.

New governance models and related marketplace rules of the game

Business-led roadmaps ensuring a seamless and significant market take up and roll out of collaborative meta-business models in different frameworks with measures and incentives

Understand and update the behaviour of the vehicle-owner and acceptance of these systems.

Develop new ways and more adaptive city planning methods

The overall mobility system with innovations

For public authorities to get a better grip on these developments different trends and challenges need to be connected, identifying no-regret measures to allow for decision makers to make well supported decisions.

Balance between private and public operations of automated vehicles to optimise traffic management and satisfaction of customers travel (multiple and varied) requirements.

Research is needed about the potentials of automated shared transport systems in terms of their feasibility (land use patterns and population density).

New consideration of value of travel time in automated vehicles.

Gaps: Frameworks/enablers

Consolidation of knowledge based on the performance of existing tools. Research into the negative and positive impacts of transport on economic activity […]

Appraisal, monitoring and evaluation approaches, including simulation tools that provide scientific evidence.
Innovative tools for stakeholder interaction, strengthening the user perspective
Holistic measures integrating mobility management and land use management
Promote best practice exchange including sharing-economy mobility

Develop new algorithms for data collecting, data expansion of the sample data to the total population and data fusion;
Best practice collection and dissemination on using big data for planning and modelling

Integration of operational, tactical and long-term planning based on actual and real-time data.

Connecting the different infrastructures to better allow for operational optimization, whilst taking into account aspects like privacy and security.
Modelling mobility behaviour for supporting optimized mobility management.
Identification of key influence factors
Handling the complexity involved at models dealing with a high number of factors and high interdependencies between the factors
Identification and specification of data requirements and the according acquisition technologies;

Exploration of the potential to transfer similar models from other domains like macro-economic modelling of rebound and backfire effects, behavioural economics;
Enriching map data to enable the application of complex, inter-modal mode and route choice in the simulation;
Efficient calibration of the simulation to guarantee accurate results for decision support
Feasibility study of using social media for evaluation of transport services
Promoting new Key Performance Indicators (KPI) on quality of transport and mobility services based on new data sources and social media;
Methodology on how to use new data sources and social media for impact assessment and evidence gathering on transport and mobility services;
Guidelines on engage users through social media for proposing new mobility services and to evaluate project proposals and selecting public procurements;
Study on the impact of transport interventions for different segments of users and the society through censoring and mobile data.

New multi-actor assessment framework integrating safety, economic and financial sustainability, societal acceptance, operational efficiency, level of innovation, labour and environmental impacts.
Structured knowledge base on current applications of Big Data in urban freight transport;
Analysis of use cases at different scales and market purposes (private and public)
Roadmap for wide-scale deployment of R&I solutions for integrated knowledge and adoption of Big Data management in urban freight.

Combine flexible regulatory frameworks and education of the citizens and stakeholders in order to protect individuals' privacy and the usefulness of private data for the good of the society
Adapt regulations in real time using ITS and mobile technologies.

New means are needed to involve citizens in the planning process through online and offline co-creation and monitoring of impacts of mobility measures through participatory sensing.

New methods are needed to deal with complex multi-level governance structures that favour the better integration of transport and land use and identify the stakeholders involved.
Truly and innovative forms of cooperation (public-public, public-private, customer-customer, private-private and private-customer)
Evidence impact on business and society, financing sustainability, regulatory aspects/legal, reliability, security, insurance aspects and ethical issues.
Analyse the impact on cost and financial sustainability of public and private infrastructures.
New methodologies, tools and market place to support collaborative contingency and continuity meta-business models.
To define appropriate bottom-up governance models and market place rules -involving all stakeholders– to remove barriers and encouraging cross-sectorial cooperation among competing services and capitalise all underutilized assets.
Funding and financing mechanisms for urban mobility and logistics solutions considering mutual impacts (economic, environmental and social)
Optimize the practices of mainstream, upscale and transfer of good experiences in urban mobility context.

Learning the good solutions from non-European countries, such as emerging market countries like China and Brazil in order to strengthen the competiveness of European transport industry.

Gaps: innovative solutions: infrastructure

Gaps: innovative solutions: management

Developing and designing land-use mix and zoning schemes

Rethinking the functionality of urban areas and neighbourhoods to improve access to goods and services and to promote a vibrant cultural life.

Investigating new spatial logistic patterns and their relation to equity of access.

Providing modelling tools and planning instruments that integrate land-use and mobility interactions.

The relation between the need to improve the urban environment and access requirements as a basis for stimulating new development? (with modal access requirements

Topology of interchanges on the basis of scale.

Assessment and evaluation of interchanges.

Carbon footprint of urban interchanges and measures for resilient operations.

New business models and governance and new investment funding and operation financing tools for (the design and) operation of stations/interchanges.

Efficiency and acceptability of (temporary) regulations related to shared use - including monitoring, control and enforcement of shared use.

Impact/requirements of automation on urban infrastructures

Management of exceptional situations (accident, traffic interruption, service disruption of any case) and measures to prevent and quickly respond to disturbances, including cost efficiency and an increase in recovery speed of systems and network.

Case studies (at micro or macro level, depending on the nature of the incident) where analysis should be made in general and in each specific […]

Behavioural response to parking pricing, understanding different components of the parking industry

Economic studies on impacts of demand management measures, as well as Context dependency

Practice of incident and emergency management for resilience and fast recovery of the network

Traffic impacts of autonomous cars with respect to network management

Updated network management tools to manage passenger and goods transport, including environment and health considerations

Data management and use.

Map existing decision support systems and working towards their integration based on KPIs (CONDUITS)

Enhance knowhow and methods to encourage people's compliance with measures /impact assessment/ quality assurance

Analytics models and tools for urban planners

Studies on land use and assessment of the impact of logistics hubs and networks

Measures for public involvement and procurement strategies

KPIs to measure the performance of urban networks and their contribution to TEN-T efficiency

CSA and expert networking activities to relate CEF funded urban nodes activities to the H2020 environment

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Gaps: innovative solutions: Services

Quality of data and validation of information

Customised information for travellers with reduced mobility.

Information privacy issues and data ownership for massive collection of person data

Quality and performance of advanced urban mobility information services.

Global cooperation on these topics.

Cooperation between national and regional smart ticketing schemes to establish interoperable smart ticketing

Payment in the same query of co-modal services and of multimodal travel products

Promotion of CEN standards.

Investigating new charging methods based on real use addressing the whole mobility chain, thus including parking fees and others – hyperconnected vehicles (beneficiary pays principle)

Extended functionalities for ancillary services, and non-transport services

Analytical economic models to support stakeholder analysis

Large-scale demostrations on logistics planning

Social and environmental impact evaluation of integrated measures for freight and passengers.

Resilient governance models, incentives and enforcement systems

Business models offering MaaS to connect people and goods movements

Use of automatically collected tot to analyse urban freight transport

Framework for data sharing

Data analysis tools that can be linked to urban freight

Gaps: innovative solutions: Modes

Higher capacity transport means, such as BHLS – Bus systems with High Level of Service

Standards and policies

Needs assessment with regards to active and light travel modes across target groups – understanding modal choice behaviour.

Develop supportive national frameworks providing for integral health, environment and transport policies to support sustainable transport modes (vertical integration);

Inclusion of active and light travel modes in surveys and modelling.

New technologies (pedelecs, cargo-cycles, and L-category vehicles – (including safety aspects)

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Break-outs

- How to move from research to deployment?

- How to scale up innovation?

- What technical, policy, socio-economic R&I is required to help shape the urban mobility ecosustem of tomorrow?