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Modelling Emerging Transport Solutions for Urban Mobility

eHUBS – MOMENTUM Webinar for POLIS Series

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Project overview

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The project

- ‘Modelling Emerging Transport Solutions for Urban Mobility’. H2020 project

EMT MADRID · NOMMON · CITY OF THESSALONIKI · CERTH CENTRE FOR RESEARCH & TECHNOLOGY HELLAS · LEUVEN · TRANSPORT & MOBILITY LEUVEN · STADT REGENSBURG · TUM · Deusto · aimsun. · POLIS CITIES AND REGIONS FOR TRANSPORT INNOVATION · UITP ADVANCING PUBLIC TRANSPORT

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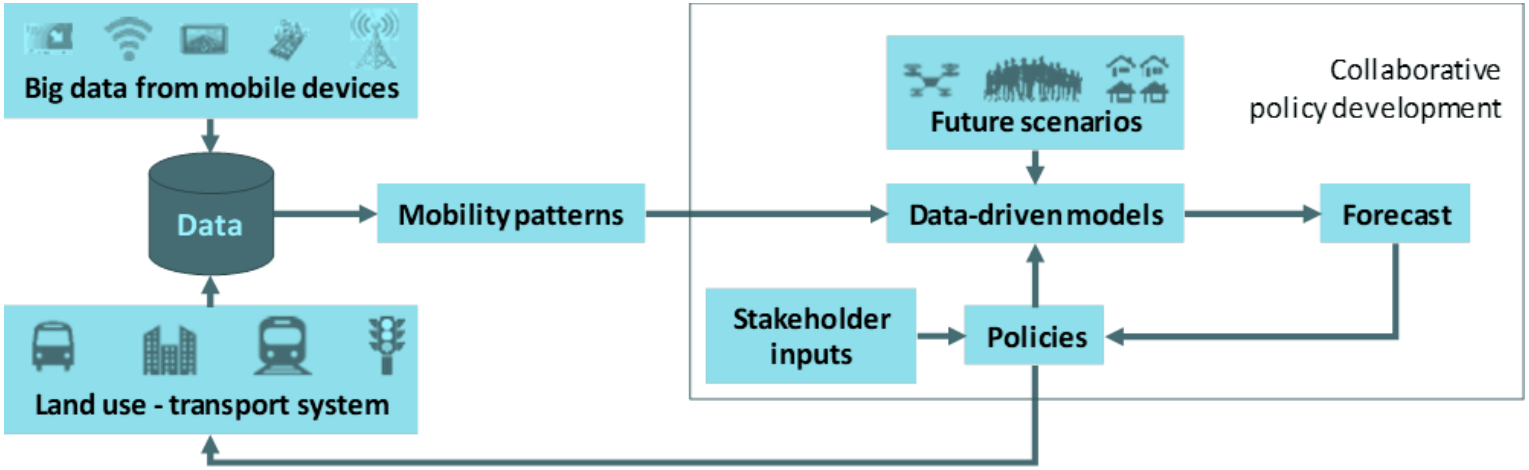
Project objectives

1. Identify a set of plausible **future scenarios** for the next decade to be taken into account for mobility planning in European cities.
2. Characterise **changes in travel behaviour**, with special focus on the demand for new forms of transport, profiting from the increasing availability of high-resolution data collected from personal mobile devices and digital sensors.
3. Develop **data-driven models** of the adoption and use of new mobility concepts and transport solutions and their interaction and complementarity with PT.
4. Develop **transport simulation and planning support tools** able to cope with the new challenges faced by transport planners.
5. Demonstrate the new methods and tools by analysing a variety of policies and innovative transport services in **Madrid, Thessaloniki, Leuven and Regensburg**.
6. Provide **guidelines for the practical use** of the methods, tools and lessons learnt delivered by the project in the elaboration and implementation of SUMPs and other planning instruments.

Approach and key outputs



1. **Future scenarios + relevant policy questions – finished**
   More information: D2.1 Challenges and opportunities for transport planning and modelling
2. **Data collection and analysis methods – ongoing with some preliminary results**
   More information: D3.1 Data Inventory and Data Quality Assessment
3. **Modelling algorithms – ongoing**
4. **Decision support tools – 2021**
5. **Guidelines for policy making – 2021**

Case studies

Leuven

Develop a new transport model

- **Circulation** plan
- Shared mobility – public transport **intermodal hubs**
- New mobility solutions in **regional mobility strategy**

Madrid

Enhance the transport model

- **Modal shifts** from private car to new mobility solutions
- Shared mobility **inclusiveness**
- Shared mobility – public transport **complementarity**

Regensburg

Enhance the transport model

- **Autonomous people mover** in public transport
- **Car ownership** decreases
- **Emission reductions** from new mobility services

Thessaloniki

Enhance the transport model

- Extension of **DRT services**
- **Ridesharing** role
- Regulation frameworks for **micromobility and bike sharing**

More information: D2.2 Specification of the MOMENTUM Test Cases

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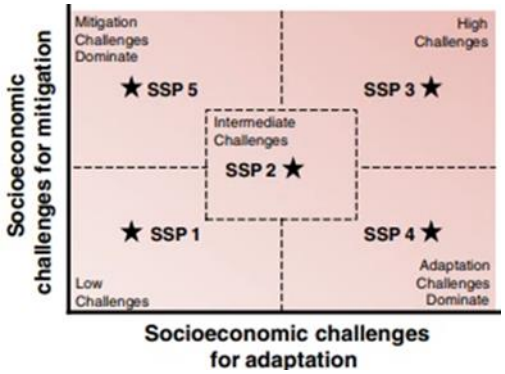
Emerging mobility solutions and transport planning techniques

Emerging mobility solutions: challenges for transport planning

- MOMENTUM has identified **major challenges for transport planning tools and techniques** related to the emergence of new mobility services
  - Workshops with policy makers and transport modellers
  - A Delphi poll engaging 16 experts in transport planning and management

Four **scenarios** for European urban mobility



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Four **scenarios** for European urban mobility → Associated **evolution of emerging mobility solutions**

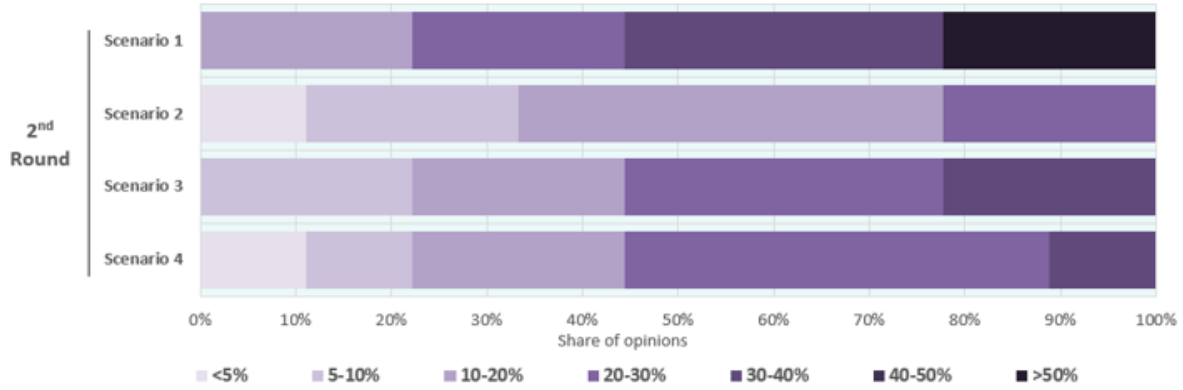

Figure 4 - Shared mobility modal share in large cities across scenarios

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Four **scenarios** for European urban mobility → Associated **evolution of emerging mobility solutions** → **Requirements** for new data analytics methods and modelling tools

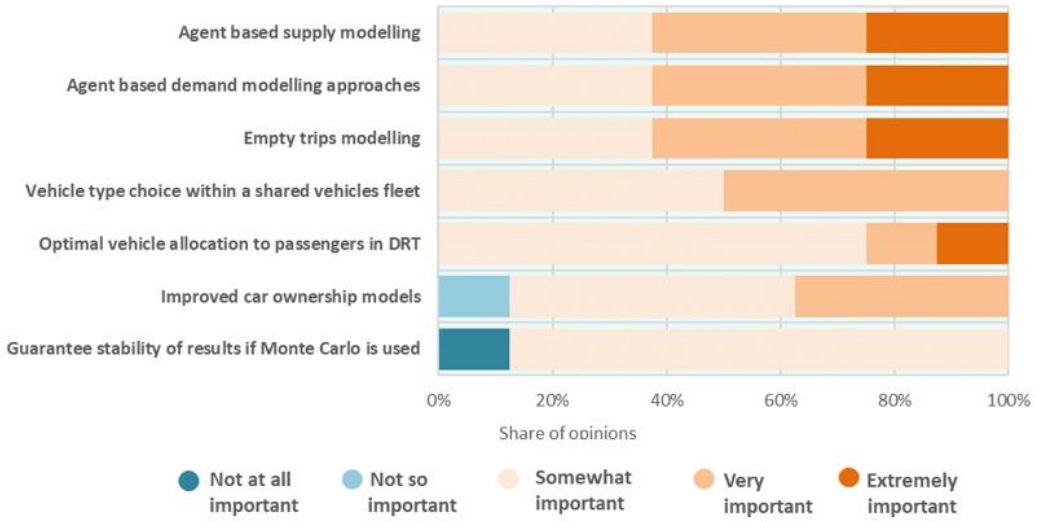


Figure 20 – Importance of transport modelling gaps for modelling new mobility options

Emerging mobility solutions: challenges for transport planning

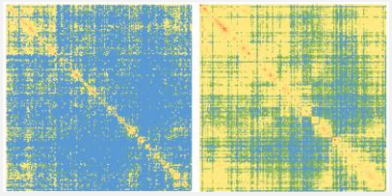
- **Consensus**
  - It is **very likely** that shared mobility services are **fully integrated in MaaS** platforms in the nearby future
  - A significant expansion of **Urban Air Mobility (UAM)** passenger services is **unlikely** in Europe
  - **Public space consumption** is seen as **the most important** adverse impact of new mobility services → eHubs!
  - New services require a **more disaggregated approach** to data analytics and modelling tools and techniques

- **Largest uncertainties**
  - Impact of **vehicle automation** in the new services and car ownership
  - **Agreements with public transport** operators

Emerging mobility solutions: data analytics

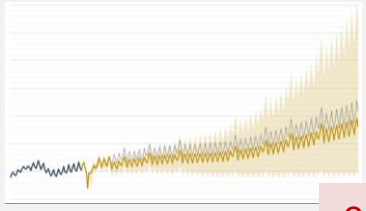
- MOMENTUM develops techniques for the analysis of longitudinal mobility information

Comparison of OD matrices



Clustering techniques

Predictive techniques



eHubs!

- MOMENTUM analyses the available data from emerging mobility services

Shared mobility adoption

- Users profiling
- Impact of car ownership

eHubs!

Shared mobility use

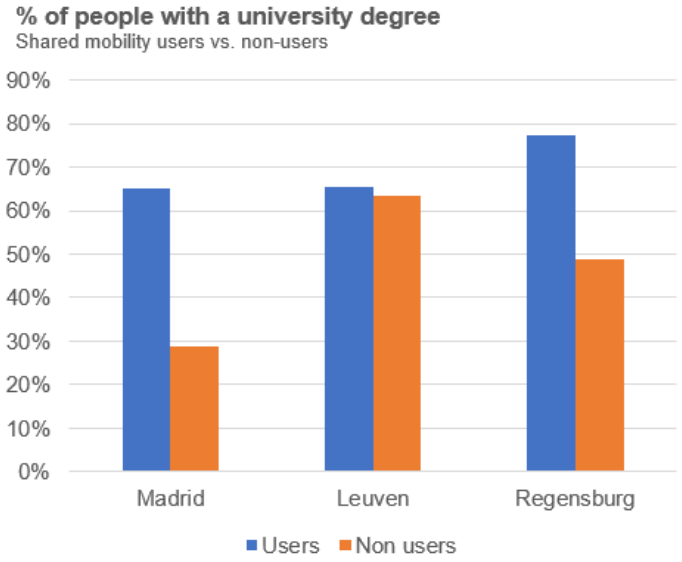
- Use frequency
- Multimodality and complementarity with PT
- Impact of weather
- Impact of supply reliability

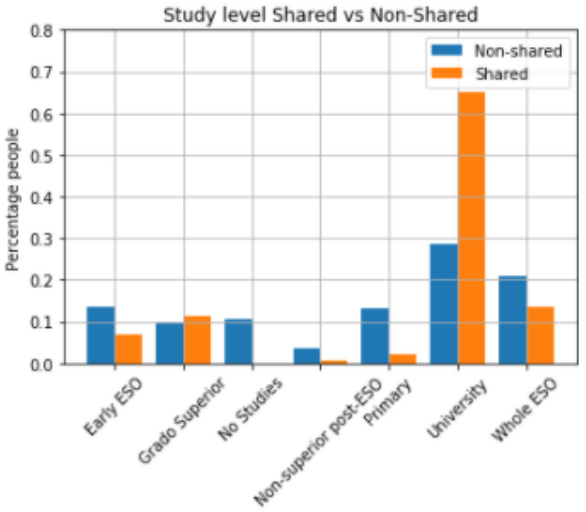
DRT use

- Taxi demand as a proxy of DRT demand
- Impact of weather
- Service indicators for DRT systems

Emerging mobility solutions: data analytics

- Shared mobility adoption
  - Strong age bias towards **younger citizens**
  - **Different patterns with regard to gender**: Madrid shows a male bias while Regensburg and Leuven show a slight female bias
  - Bias towards **highly educated population** groups (stronger in Madrid and Regensburg)
  - Higher subscription rates among **car non-owners**
- Shared mobility use
  - **Door-to-door use** prevails over multimodal chains in carsharing and motosharing services (Madrid case)



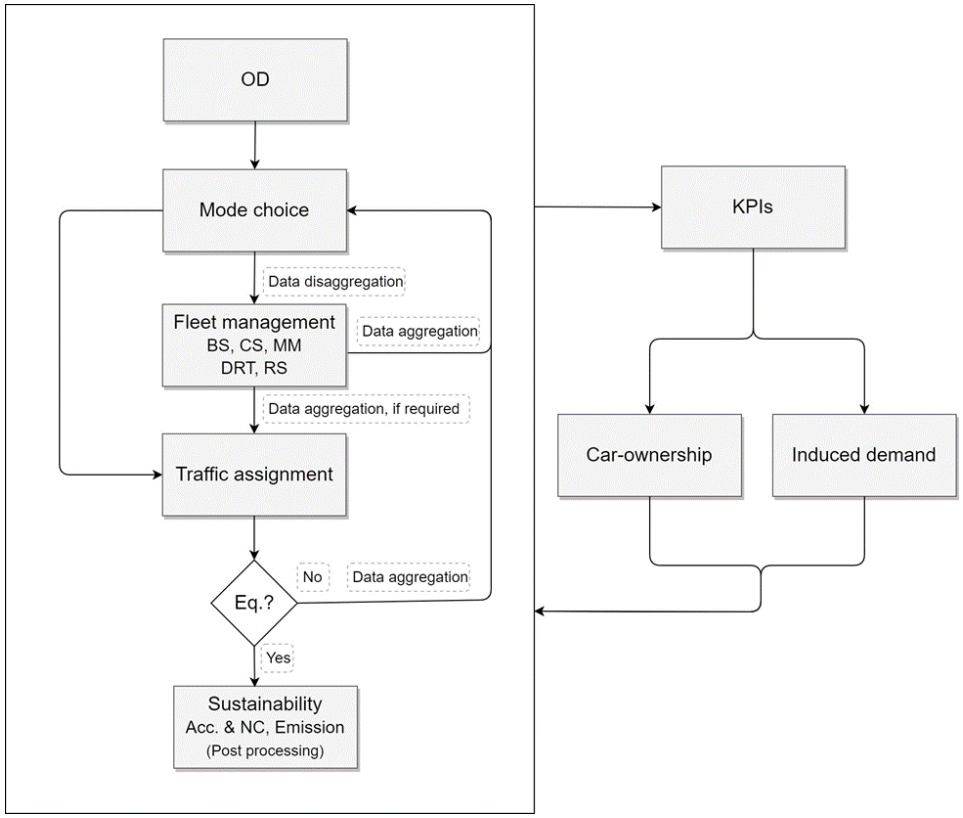


Stay tuned for more results!

Emerging mobility solutions: modelling tools

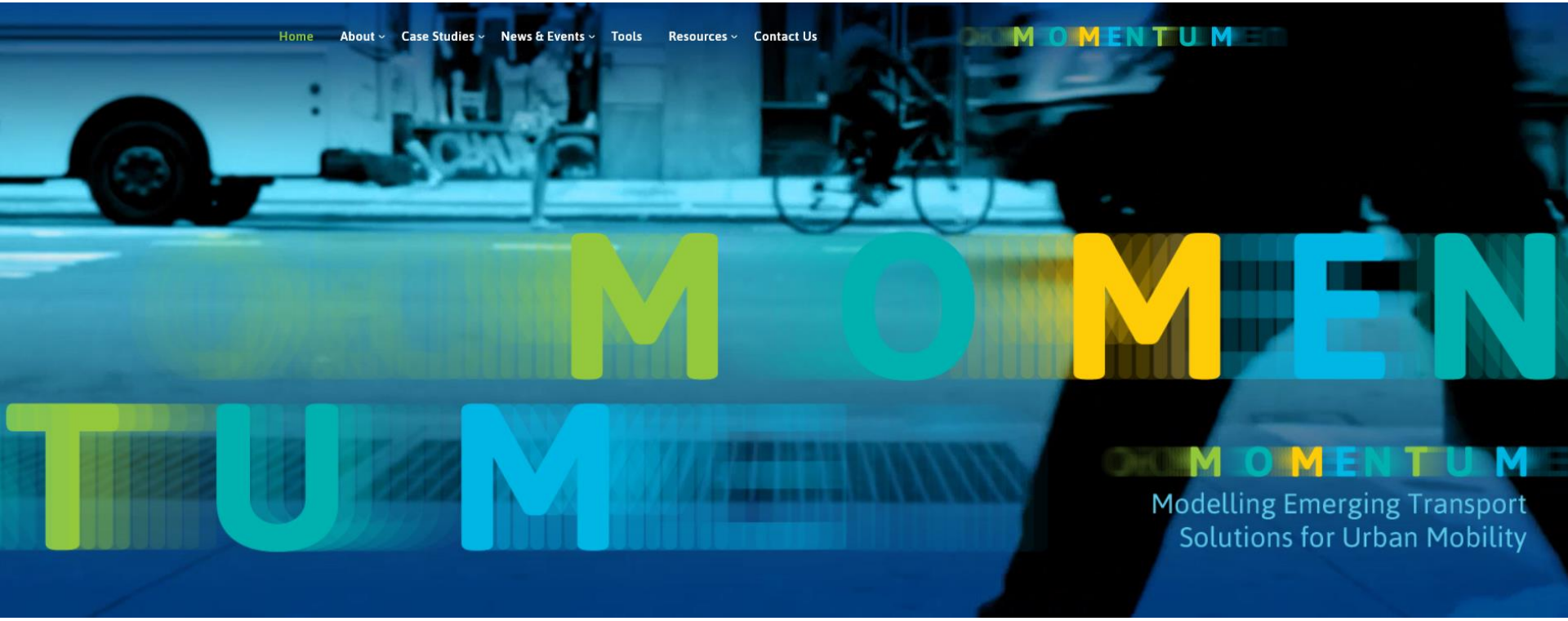
- MOMENTUM takes advantage of the increasing data availability
  - to include artificial intelligence models that exploit historical data from emerging mobility services
  - to develop more disaggregated approaches to transport simulation

Tools capable of predicting the demand of new e-Hubs under different scenarios



Stay tuned for incoming results!

THANKS!



https://h2020-momentum.eu/

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