



MOMENTUM
Modelling Emerging Transport
Solutions for Urban Mobility

Modelling the impact of new mobility solutions: zooming in on MOMENTUM cities Madrid & Thessaloniki

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Project Overview

- H2020 project: Develop a set of **new data analysis methods, transport models and planning support tools** to capture the **impact of new transport options**, in order to **support cities** in the task of **designing the right policy mix to exploit the full potential** of these emerging mobility solutions
 - Start: 1st May 2019
 - Duration: 36 months
 - Budget: 2.9 M€

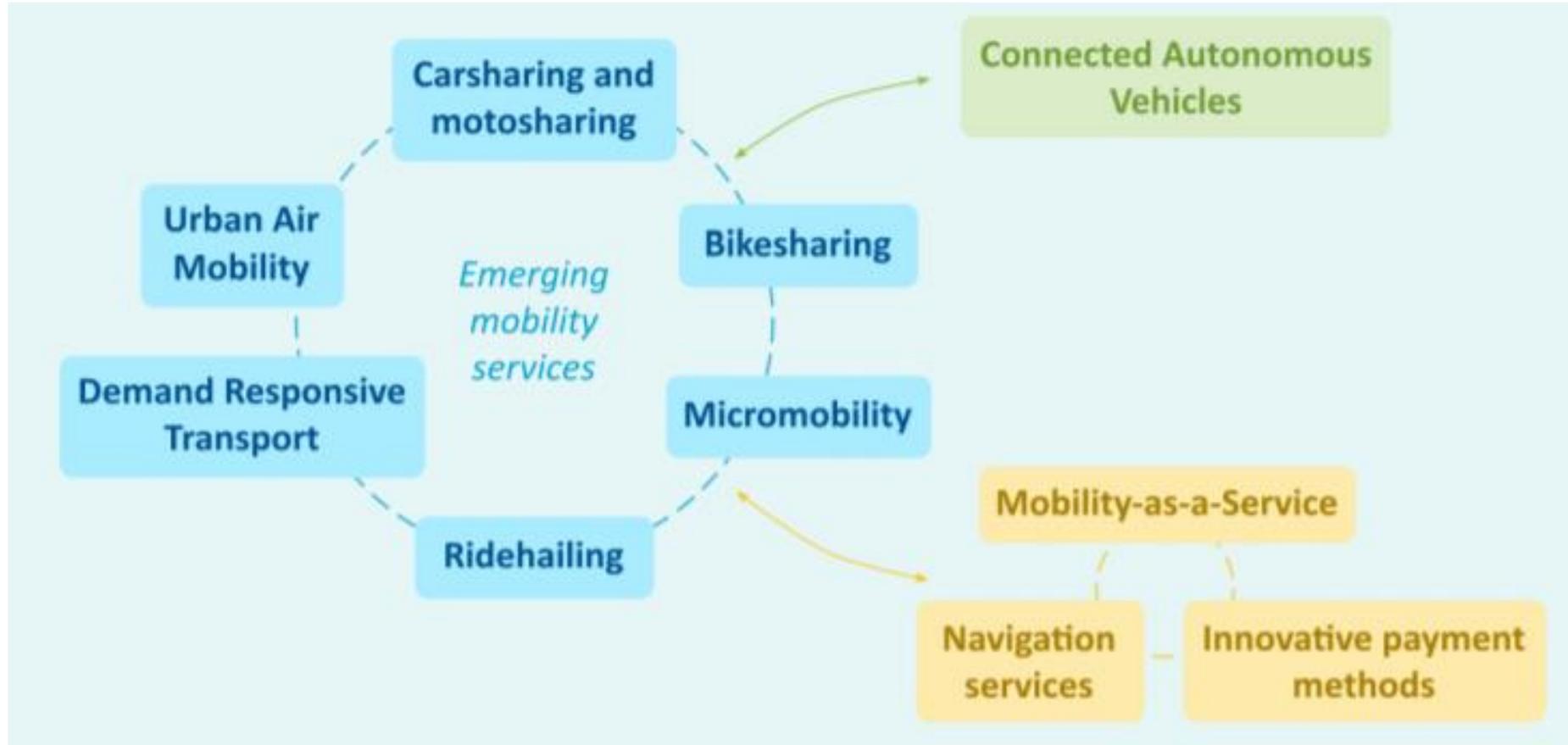
- Consortium: EMT Madrid (Coordinator) + 3 additional cities (Thessaloniki, Leuven, Regensburg) + 2 providers of technology solutions for transport planning (Nommon, Aimsun) + 1 transport consultancy (TML) + 3 research institutions (CERTH, TU Munich, Deusto) + POLIS + UITP.



NOMMON



Growing complexity of urban ecosystem



A challenge for current tools

- Service adoption drivers
- Supply-demand interaction
- New impacts to assess
- ...



- Data analysis and modelling techniques used by transport practitioners need major adaptations

- Technical advancements need to be integrated in tools that are usable by policy-makers



Data analytics developments

- Techniques to exploit the data generated by new services – together with other emergent disaggregated demand sources

Shared mobility user profiling

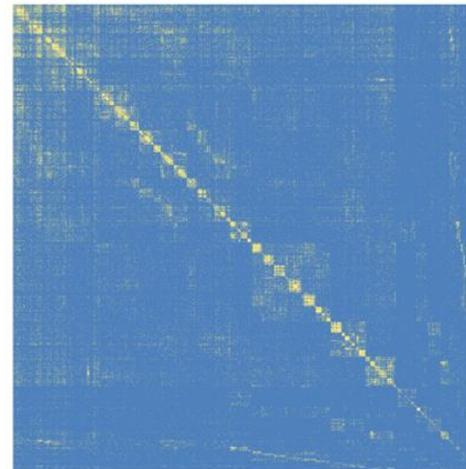
Shared mobility demand monitoring

On-demand trips clustering

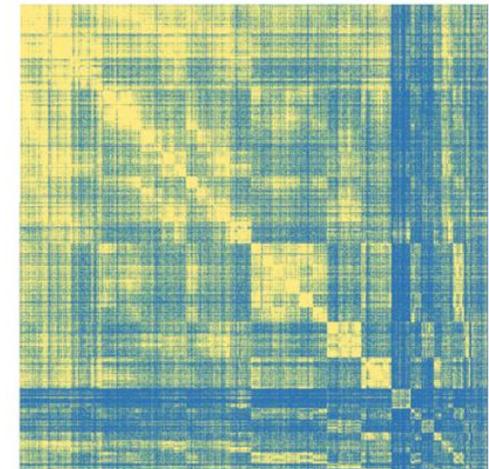
OD matrices similarity measures

Representative OD matrix estimation

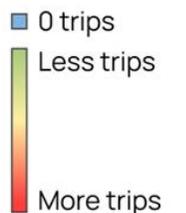
Household survey



Mobile network data



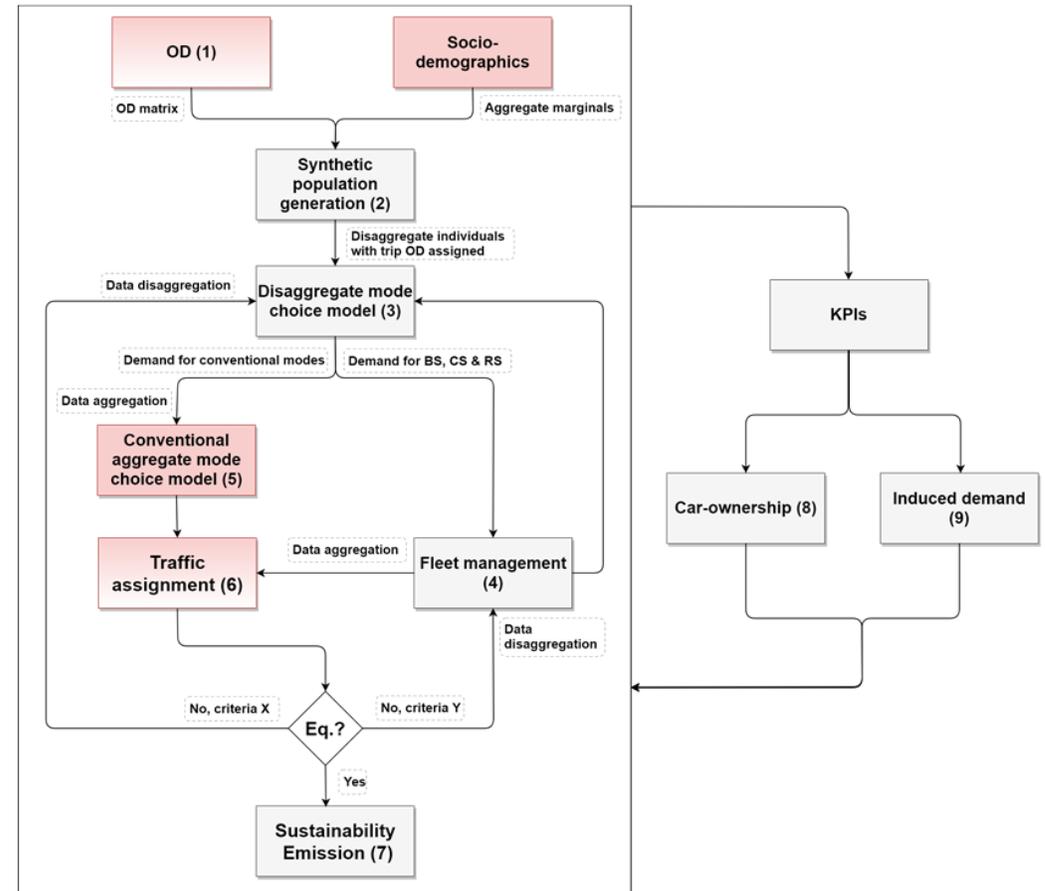
Legend



Modelling developments

- A modular approach – techniques adapting & improving several transport modelling steps
- A complete modelling toolset to cover both **low-penetration** and **high-penetration** scenarios

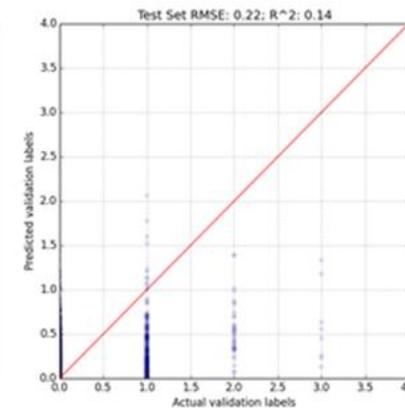
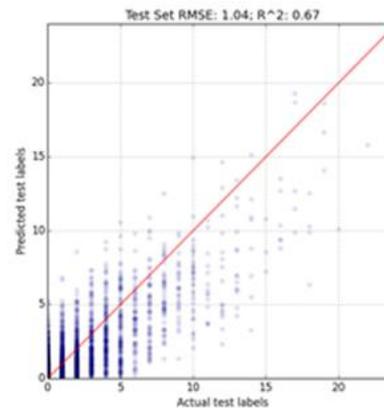
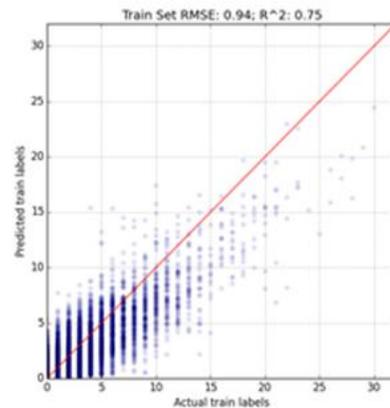
<https://github.com/h2020-momentum>



Modelling developments

Mode choice modelling

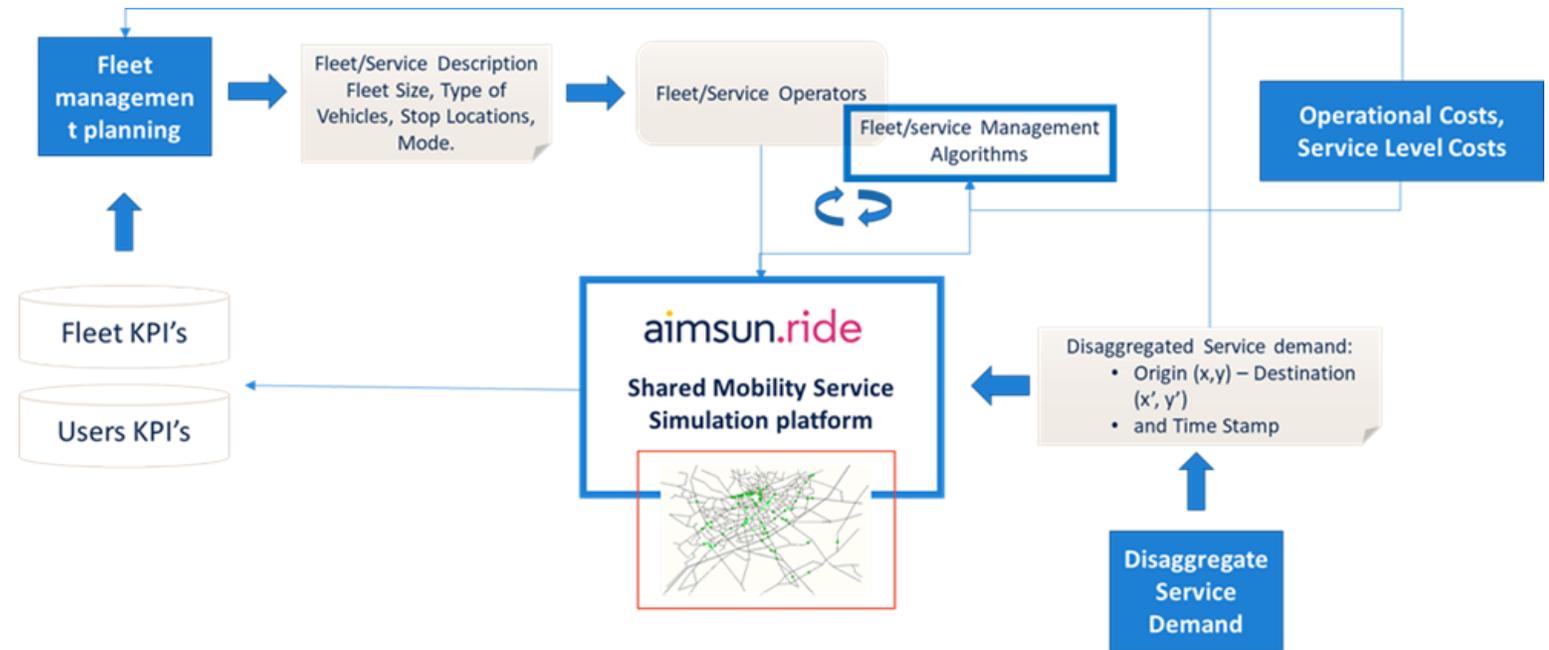
- Disaggregated logit mode choice model based on survey data - conventional vs. non-conventional modes
- Data-driven AI models for predicting shared mobility demand based on operation data



Modelling developments

Fleet management

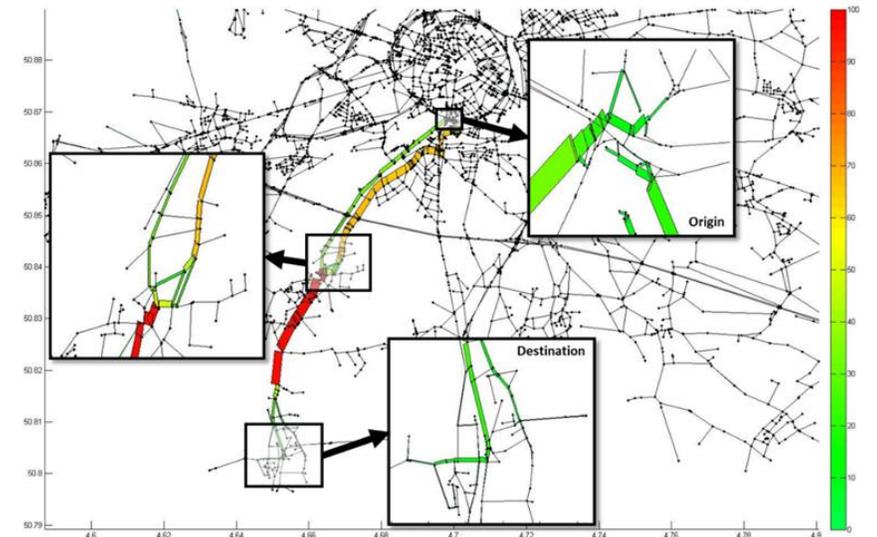
- Aimsun Ride solution: simulation of shared mobility operations and its impacts on the network
- Set of planning and operation algorithms adapted to different services



Modelling developments

Traffic assignment

- Representation of local roads in the network – overcoming connector placement problem distributing ODs across all network links
- Integration of an hybrid Dynamic Traffic Assignment (DTA) approach in the Aimsun Next solution to support fleet management applications



Decision Support Tool



- Leverage the analysis and modelling developments through a flexible DST – enabling evidence-based policy assessment

	Input data requirements	Analysis capabilities
Level 1	Low: demographics + socioeconomic data	Analytical: preliminary transportation design
Level 2	Medium: mobility data	Extensive: data-driven decision-system
Level 3	High: full information using transport simulation tools	Comprehensive transport planning

Case studies applications



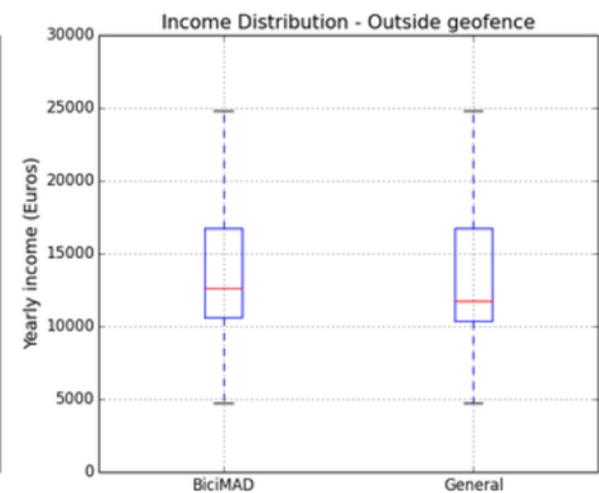
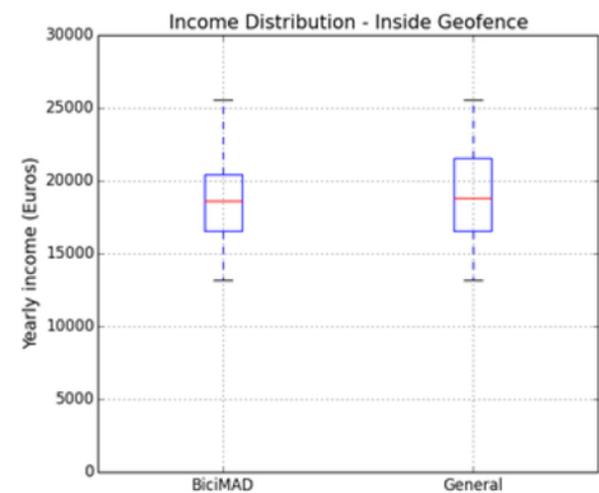
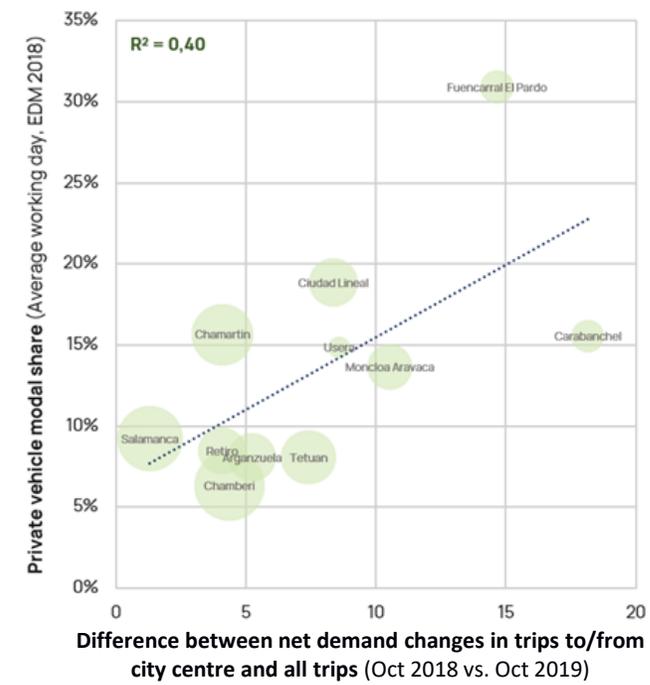
- Leuven is developing a new transport model – Madrid, Regensburg and Thessaloniki exploit existing models

some examples...

Leuven	Attractiveness of intermodal hubs
Madrid	Impacts of shared mobility services
Regensburg	Car ownership impacts of new mobility
Thessaloniki	Strategies for DRT implementation

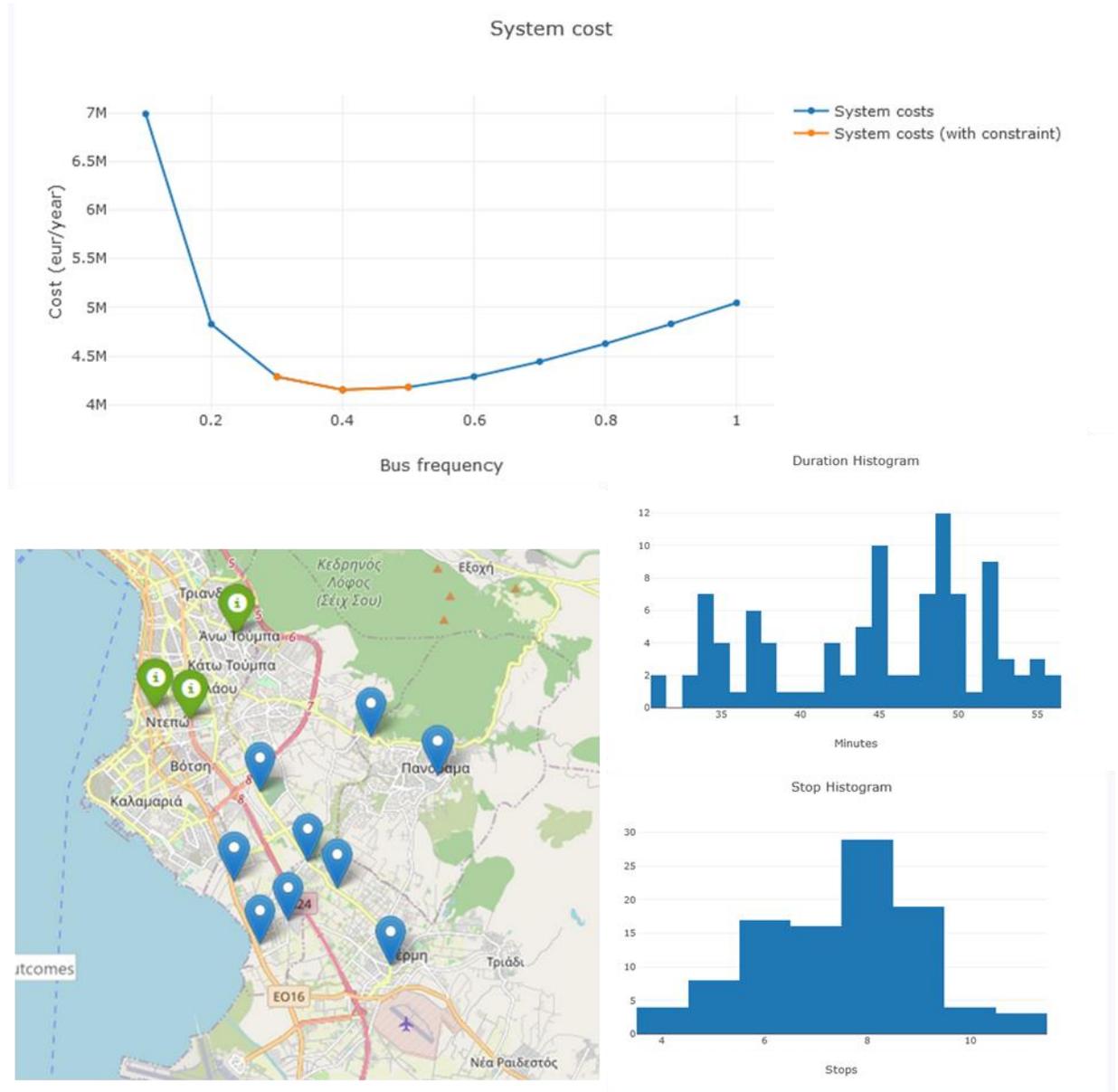
Some Madrid outcomes

- What are the adoption and use patterns of shared mobility services?
 - Some services (e.g. moto sharing) attracted demand from private car users once access restrictions were implemented
 - Shared mobility users have 20% higher income than overall population – mostly due to initial expansion in central areas
 - Public bike sharing service BiciMAD complements public transport: higher demand in stations connected with commuter railway



Some Thessaloniki outcomes

- In which areas DRT services should be implemented? How many stops and vehicles? Where should these stops be located?
 - DRT services could be provided in the eastern suburbs of the city.
 - An average frequency of 2-3 services per hour provided by a total of 4 vehicles would be sufficient.
 - A total of 12 stops would allow us to cover the 84% of the potential demand.



Key takeaways for now

- **Dynamic evolution** of new mobility solutions (e-scooters, CAVs...)
- **Digitalisation** puts new fine-grained data sources on the table: an opportunity for disaggregating our models
- Modelling efforts have to deal not only with use but also with **adoption and its impacts** (e.g. car ownership)
- Cities require **flexible tools** – evolving services, but also be aware of different **data availability** and **technical skills** contexts

NEW EU SUMP Guidelines on Resilience

M O M E N T U M

MOMENTUM at the new and recently launched EU Topic Guide, “Planning for More Resilient and Robust Urban Mobility”. Drawing on lessons learned during the COVID-19, the Topic Guide introduces the concept of resilience in urban mobility and presents the importance of integrating it into the SUMP process

<https://civitas.eu/news/new-topic-guide-planning-more-resilient-and-robust-urban-mobility>



OUT NOW!



TOPIC GUIDE:

PLANNING FOR MORE RESILIENT AND ROBUST URBAN MOBILITY

Social Media:

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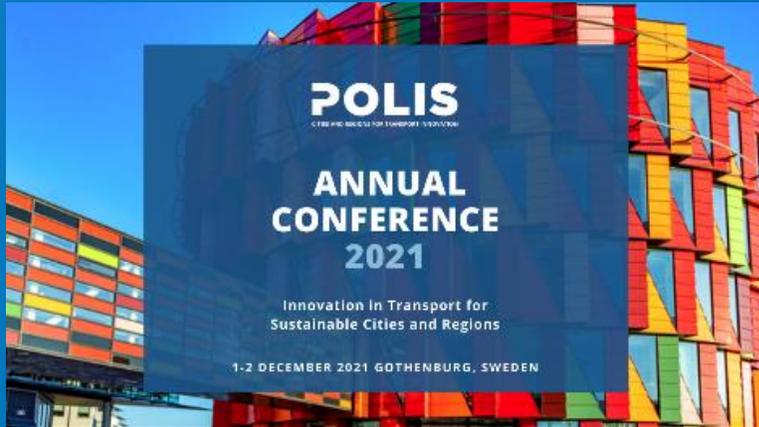
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Thank you for your attention!

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