HARMONY
SPATIAL & TRANSPORT PLANNING FOR A NEW MOBILITY ERA

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HARMONY model suite: an integrated spatial and multimodal transport planning tool to lead a sustainable transition to a new mobility era

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Spatial and transport planning in metropolitan and urban areas

Metropolitan areas

- **Greenhouse gas emissions, energy consumption, pollutant emissions**

- **Widespread congestion**

- **accessibility and usage of public transport**

Spatial and transport planning in metropolitan and urban areas

Metropolitan areas

- **new disruptive mobility services (MaaS, sharing mobility, etc.)**

- **new technologies (autonomous vehicles, drones, e-scooters, etc.)**

Sustainable metropolitan and urban development

→ spatial and transport planning policies and investments

HARMONY project - Vision

HARMONY: Holistic Approach for Providing Spatial & Transport Planning Tools and Evidence to Metropolitan and Regional Authorities to Lead a Sustainable Transition to a New Mobility Era

European project funded by the European Commission within the *Horizon 2020 Framework Research Programme* (www.harmony-h2020.eu)

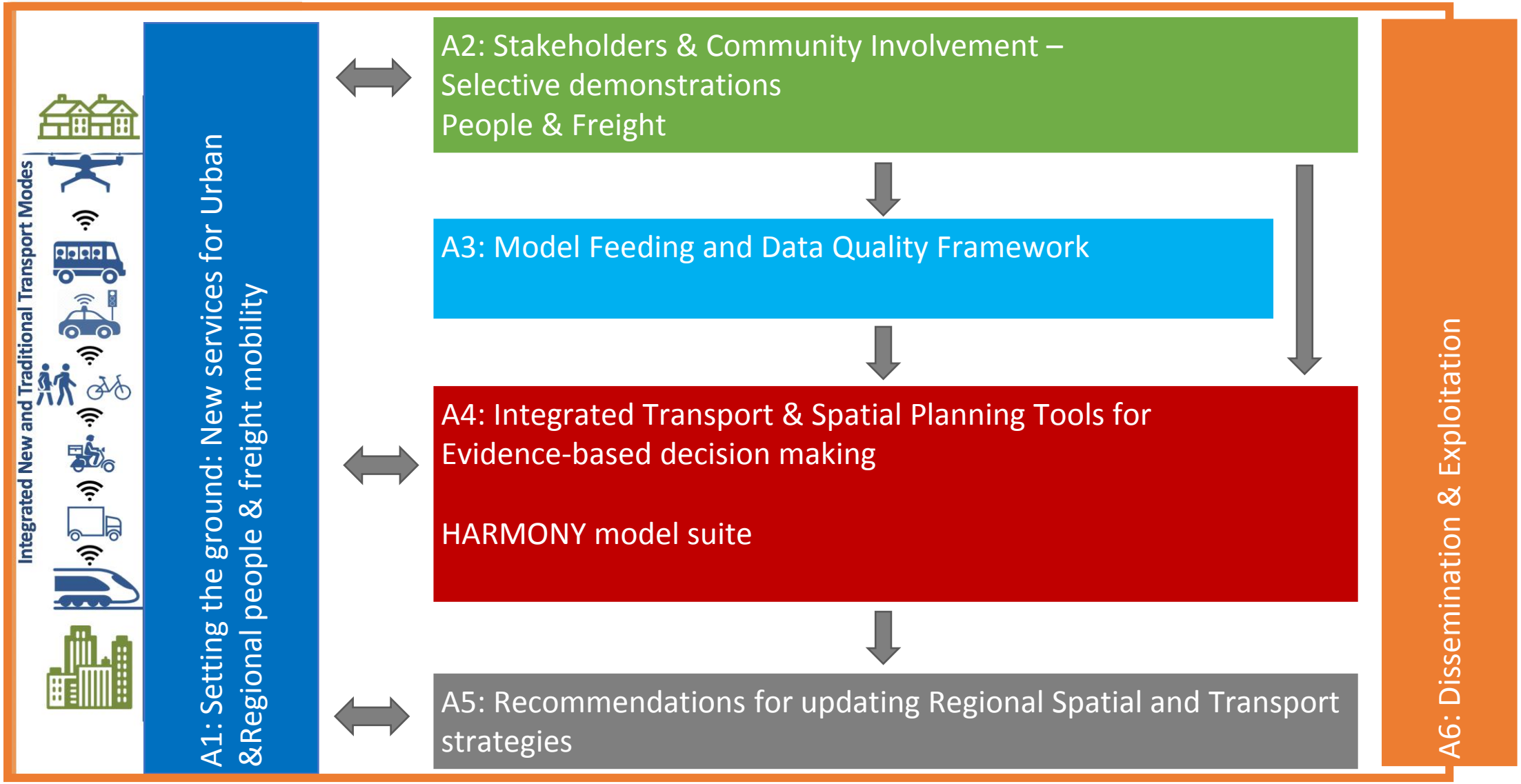
Duration: June 2019 – November 2022

Develop **a new generation of harmonised spatial and multimodal transport planning tools**

HARMONY consortium

21 partners from 9 European countries

HARMONY concept



HARMONY Metropolitan Areas' Activities

Rotterdam
- Electric AV demonstration - freight
- HARMONY Model Suite - Freight

Oxfordshire
- Electric AV demonstration - Passenger & freight
- Drones demonstration - Freight
- HARMONY Model Suite - Passenger

Trailblazing

Athens
- HARMONY Model Suite - Passenger

Turin
- HARMONY Model Suite - Passenger

Aspiring

Trikala
- Drones demonstration for medical purposes

GZM
- Adopter metropolitan area

Follower

Main outcomes

- The **HARMONY Model Suite** (software)
- **AVs and drones demonstrations**
- **Training material** and activities for using the HARMONY Model Suite
- **Recommendations for SUMPs update** (AVs & drones included)

HARMONY Model Suite (MS)

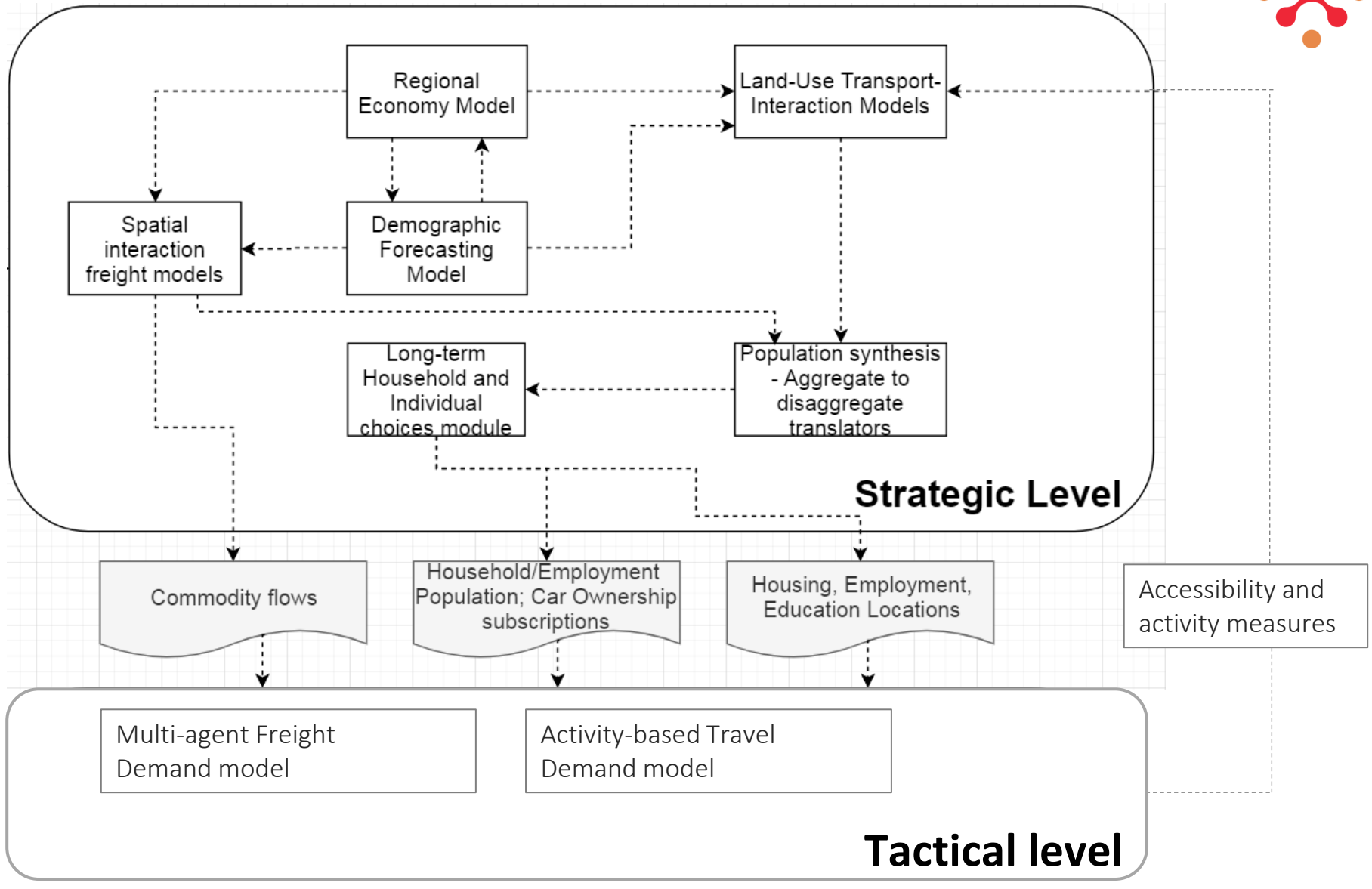
- **New mobility services and technologies** → added level of modelling complexity in transport demand and supply models
- Demand model frameworks in activity-based models should be extended with **new behaviourally realistic model structures**
- Developing a **multi-scale, software-agnostic, integrated model system** (mainly based on the activity-based approach).
- Enabling end-users
  - to **couple/link independent models**
  - to **analyse regional and urban interventions** for both passenger and freight mobility (e.g. policies and capital investments, land-use configurations, economic and sociodemographic assumptions, travel demand management strategies and new mobility service concepts)

HARMONY MS - structure

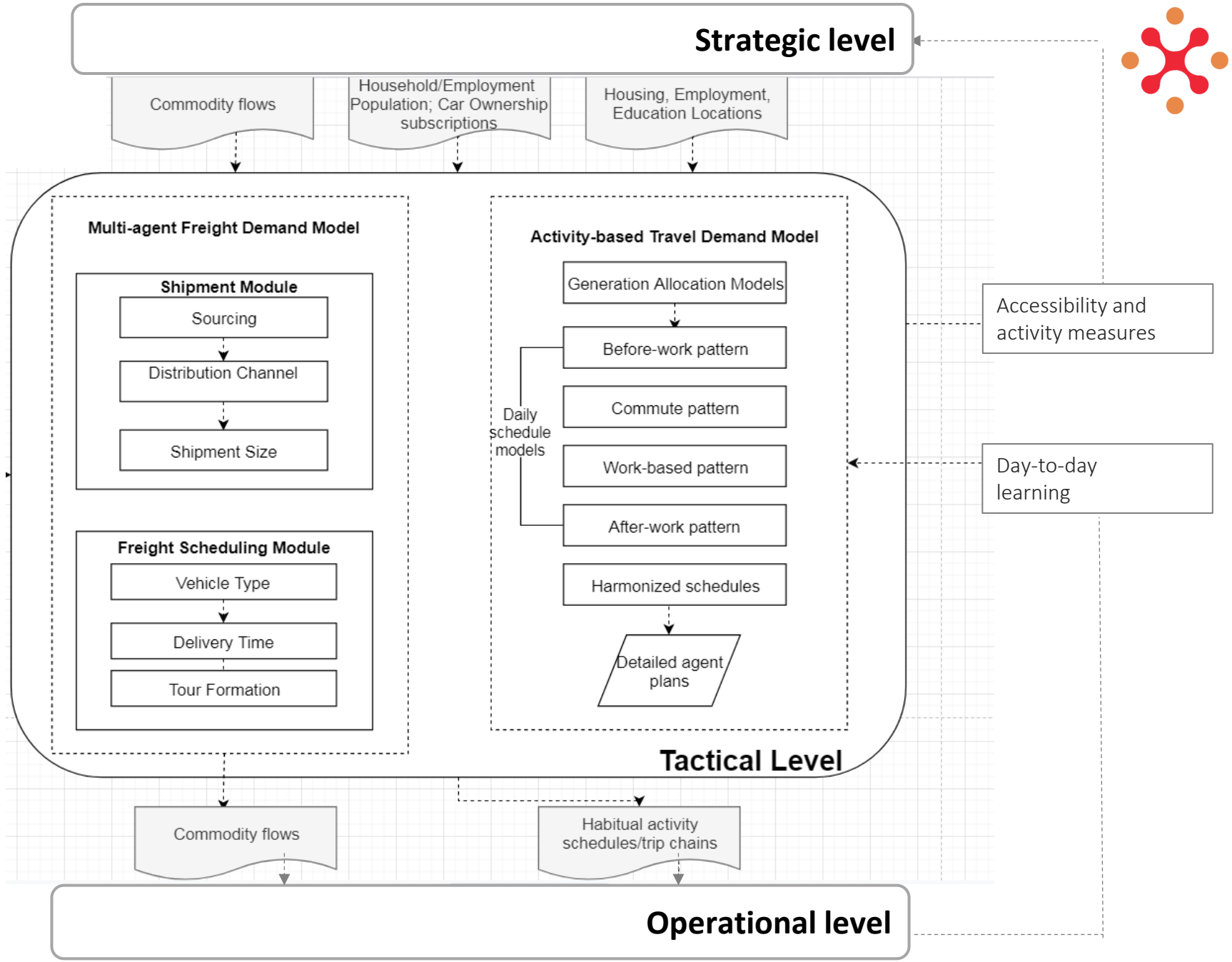
The **HARMONY MS** integrates new and existing sub-models with a multi-scale approach:

- *Strategic Level* → mainly composed of regional economic, demographic forecasting, land-use, spatial freight interaction and long-term mobility choice models. Long-term horizon (e.g. year-to-year, every 5 years)
- *Tactical Level* → made of a fully agent-based passenger and freight demand model, representing passenger and freight agents' choices. Mid-term horizon (e.g. on a day-to-day level)
- *Operational Level* → representing the transport supply and demand interactions at high granularity. Short-term horizon (e.g. second to second, minute to minute)

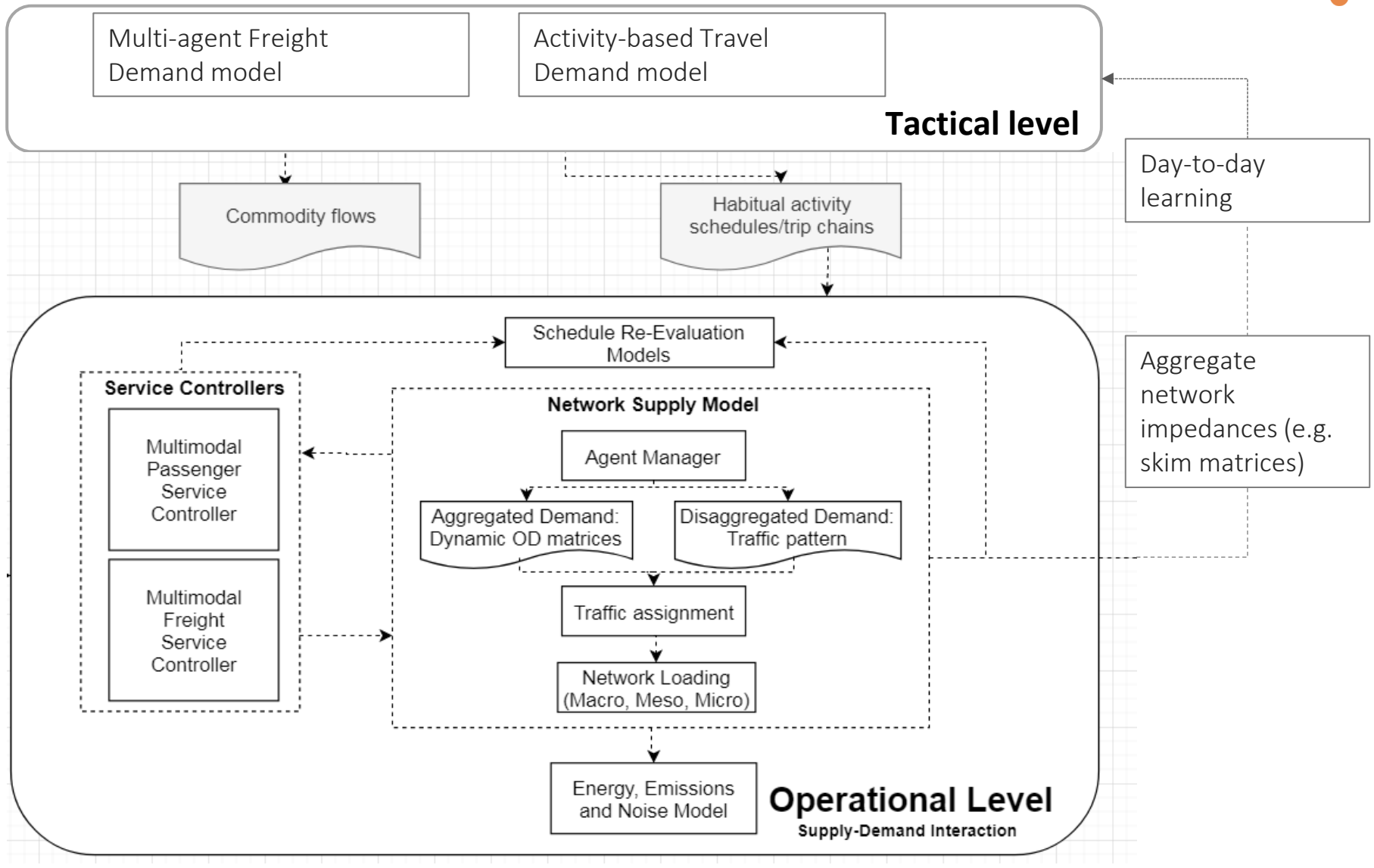
HARMONY MS Strategic level



HARMONY MS Tactical level



HARMONY MS – operational level



HARMONY project – where we are

- Investigating new mobility services and technologies for passenger and freight
- Review of policy appraisal methods, Sustainable Urban Mobility Plans guidelines and Key Performance Indicators
- Involvement of local stakeholders
- Demonstration with drones in Trikala
- Setting-up demonstrations with autonomous vehicles in Oxfordshire and Rotterdam
- Definition of the concept and technical specification of the HARMONY Model Suite architecture
- On-going development of the models and of a first prototype of the HARMONY Model Suite

Conclusions

- HARMONY MS development
  - Harmonised spatial and multimodal transport planning tool
  - Analysis of regional and urban policies and interventions for both passenger and freight mobility, in the light of new mobility services and technologies
  - Multi-scale, software-agnostic, integrated activity-based model system
  - Flexibility to connect with existing tools and running only part of the HARMONY MS

HARMONY

SPATIAL & TRANSPORT PLANNING FOR A NEW MOBILITY ERA

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