

# Fitting the Puzzle Together – Opportunities and Challenges for Seamless Travel

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(See references and last slides for tips on further reading.)

# The technology is a tool, not a goal

*Mobility is more than modes of transport, and seamless mobility services entail more than a technical interface overlaying those modes.*

*An eager, but naïve, technology-driven approach –  
“if you build it, they will come”*

Customer segment?



Modes? Bundle?

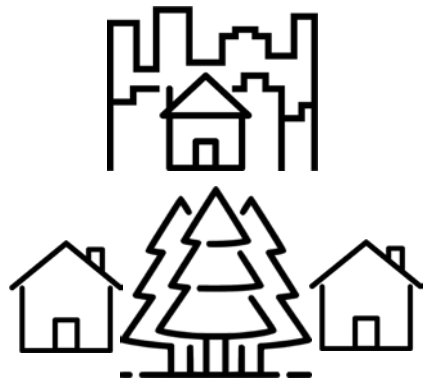


# The technology is a tool, not a goal

*Mobility is more than modes of transport, and seamless mobility services entail more than a technical interface overlaying those modes.*

## A systems approach – the “user” in a societal context

Geographic context



Infrastructure &  
mode access  
Costs of living  
Weather  
...

Family / household context



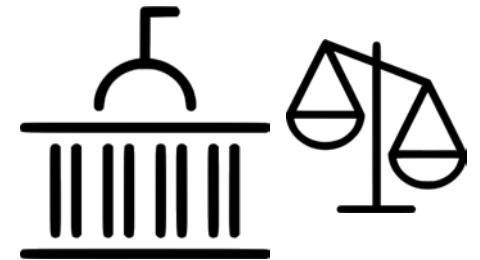
Financial resources  
(Mode) ownership  
Abilities  
Knowledge, habits  
Stress  
Identity, values  
Competing needs  
Others' demands e.g.  
employers' demands

Service & org. context  
(Value proposition)



Service design  
Business models &  
(perceived) opportunities  
Interpretation of regulations  
Organizational goals  
Collaboration  
...

Societal, legal &  
regulatory contexts



Trends and norms  
Taxation  
Transportation-related  
policies e.g. parking  
Urban planning and  
land-use policies  
...

# Adopting an innovation (product or service) is a process

*The process is easily disrupted, and users need support throughout this process. (In fact, innovation is a process many organizations need to undertake too.)*

## Knowledge – Persuasion – Decision – Acclimatization – Normalization – Confirmation

The (potential) adopter evaluates the innovation based on e.g. relative advantage, complexity, trialability, observability, etc.

It is the **relative advantage** of MaaS that must be considered, rather than specific socio-demographics or mode-use characteristics. **MaaS must be perceived as better** in some way(s), proportionate to the costs (e.g. money, effort) compared to the user's current solution (i.e., relative advantage will differ from user to user).

**Contributing service design attributes** include:

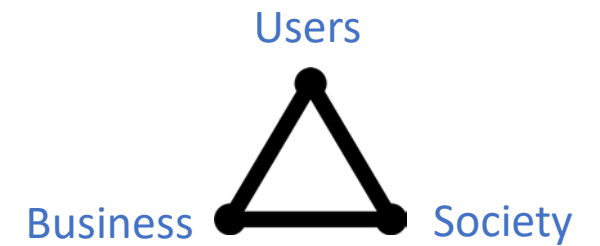
simplicity and ease of use, improved access, flexibility, convenience, price-worthiness, easy to try, etc.

**MaaS cannot be perceived as...**

- More expensive (without enough other added value)
- More inflexible, inconvenient, or inaccessible (“too far away” from infrastructure, needing multiple car seats)
- Too difficult to understand and use, e.g.
  - learning how to be a customer incl. onboarding, to use the app, to access vehicles
- Incomplete in some way, e.g. inadequate range of modes, app functionalities, or service features

# Aligning the user, business and societal perspectives

Maximizing matches, minimizing mismatches, identifying gaps. What trade-offs are acceptable and who decides?



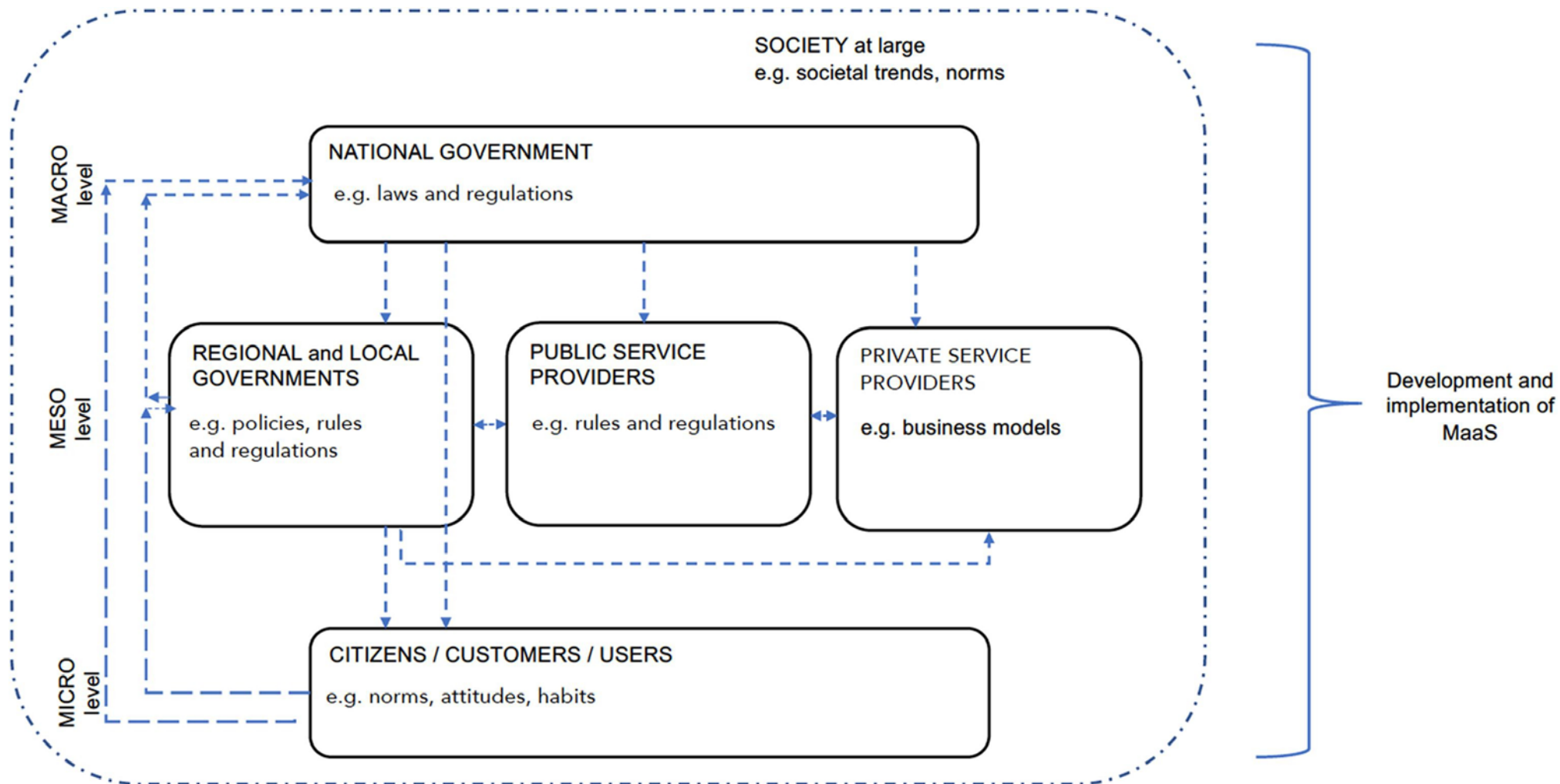
Developing MaaS services (& offers) that can meet users' needs and add value, while promoting societal goals. For example:

Users (needs/motives)	Service (offer)	Societal goals
Everyone	↔ ? ↔	Improve occupancy & utilization rates; increase sharing; shift towards more sustainable modes
People who primarily walk and bike, low costs	↔ ? ↔	Avoid inducing demand for less sustainable modes
Multi-modals who use cars semi-frequently or people looking to access cars	↔ ? ↔	Offset car purchases
Households looking to downsize, economize, etc.	↔ ? ↔	Reduce the number of private cars (selling the secondary or primary car)
Households with limited or no access to a public offer	↔ ? ↔	Improve access to the nearest public offer AND/OR increase sharing e.g. P2P

# Implementing Mobility as a Service is complex

And complexities tend to be underestimated, partly due to a lack of experience.

IRIMS analytical framework to identify institutional factors (enablers and barriers) affecting the development and implementation of MaaS



# New modes and services often fall between the legal cracks

*Many public policies and regulations may need to be tweaked or reworked to allow for such services to emerge at scale*

Some problematic and/or gray areas:

- **procurement procedures** can suppress long-term collaboration between the public and private sectors  
e.g. lack of flexibility (need to know exactly what you want), time delimited and cannot just continue if it works
- **taxes and subsidies** e.g.
  - bundling different services with different VAT levels;
  - tax deductions are rewarding car use;
  - subsidizing company cars instead of being able to offer a "mobility budget" (from employers or government);
  - payments levels and income from shared/P2P services (when does it become a "business"?);
  - possible to subsidize ridesharing instead of sending a "PT vehicle"?
- **parking** e.g.
  - parking permits;
  - parking spot requirements (e.g. one per apartment);
  - allocating space for shared vehicles;
  - booking unused parking spots
- **insurance** e.g. for P2P rentals or sharing between companies
- **other** miscellaneous policies e.g.
  - shared vehicles using taxi/bus lanes;
  - identification process for collecting other people's packages;
  - transporting other people's goods to recycling centers

# Public sector and PTA roles and activities

*Regardless of the path chosen, MaaS will likely require new relationships and processes*

**What is public transportation?** (EU regulation on public transportation → national law / regulation on PT)

- Currently very concrete categories of modes e.g. public transportation, taxi, private car (in Sweden)
- New shared modes do not fit well into this categorization
- Uncertainty around (perceptions of) PTAs' role(s), mission and responsibility (i.e. what they should and may do)
- Cultural differences: Play it safe, versus Try it out until someone stops us.
- public transport / mass transit versus *kollektivtrafik* ("Tack för att du reser tillsammans", Västtrafik campaign)

**Can still be difficult to align perspectives even within the public sector**

- Top-down approach → lack of sense of ownership / control on the regional/local levels, which can result in following the letter vs. the spirit of the law (i.e. slow moving actors, inflexible APIs, only reselling single tickets)
- Bottom-up approach → larger players can be perceived to dominate; can be difficult to find a business case
- Agreeing on the what but not the how → a danger that good ideas will never be actualized
- Viewing emerging services as competing with, complementing, or even strengthening public transport

***The public sector is needed to facilitate MaaS (short term, e.g. technical data interfaces) AND steer the trajectory towards societal goals (long term, e.g. infrastructure and land use planning, taxation & subsidies, etc.)***

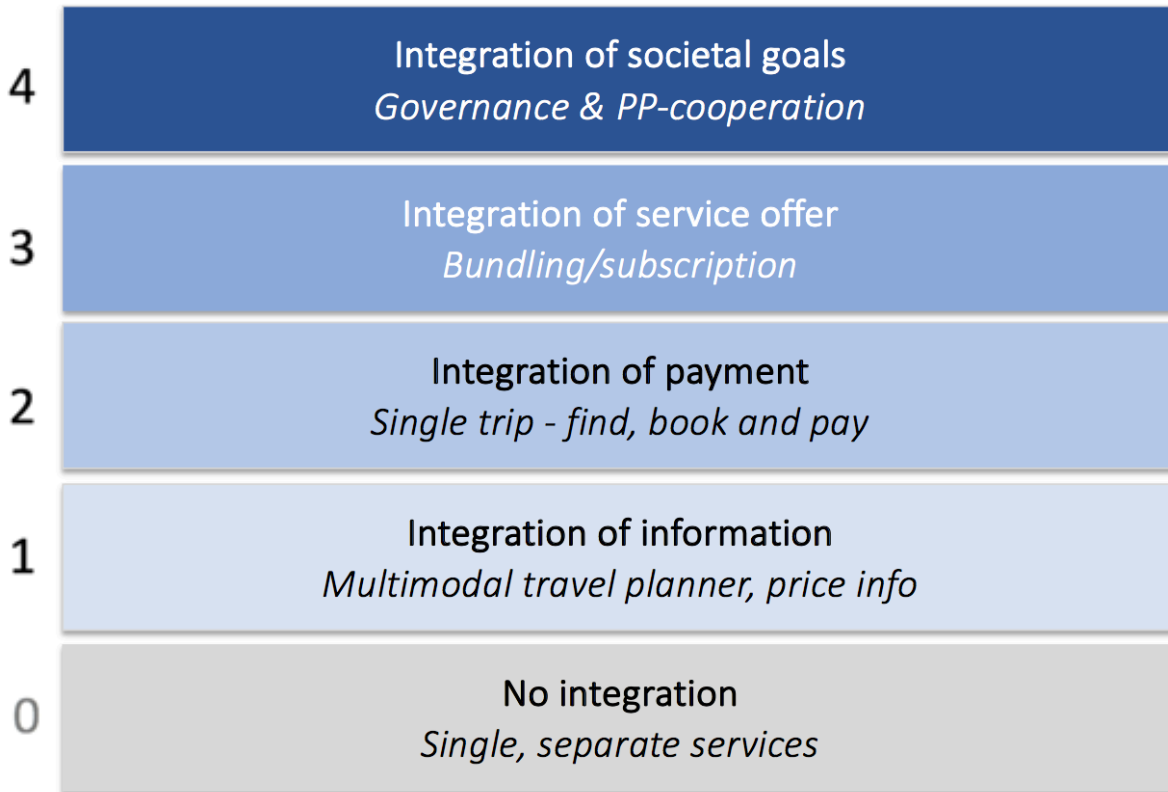
Some public sector activities that can support MaaS developments:

- Establish a long-term vision for MaaS
- Develop an innovation agenda (including policy)
- Facilitate experimentation and knowledge generation



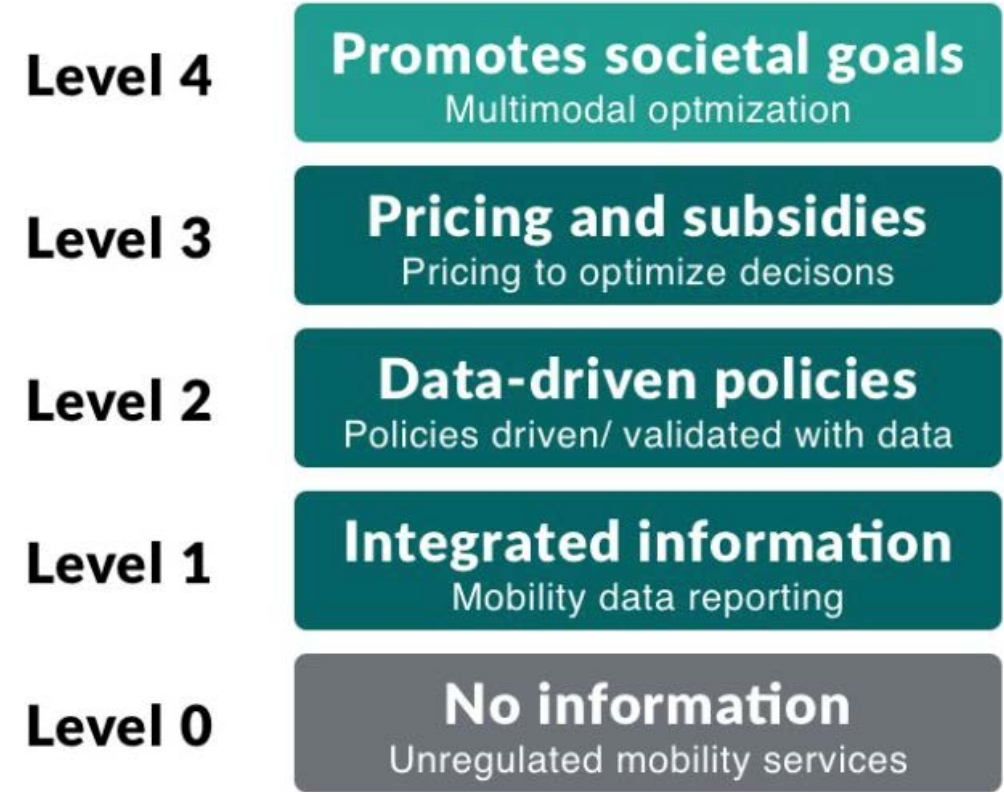
# How might societal goals be integrated?

MaaS topology (Sochor et al., 2018)



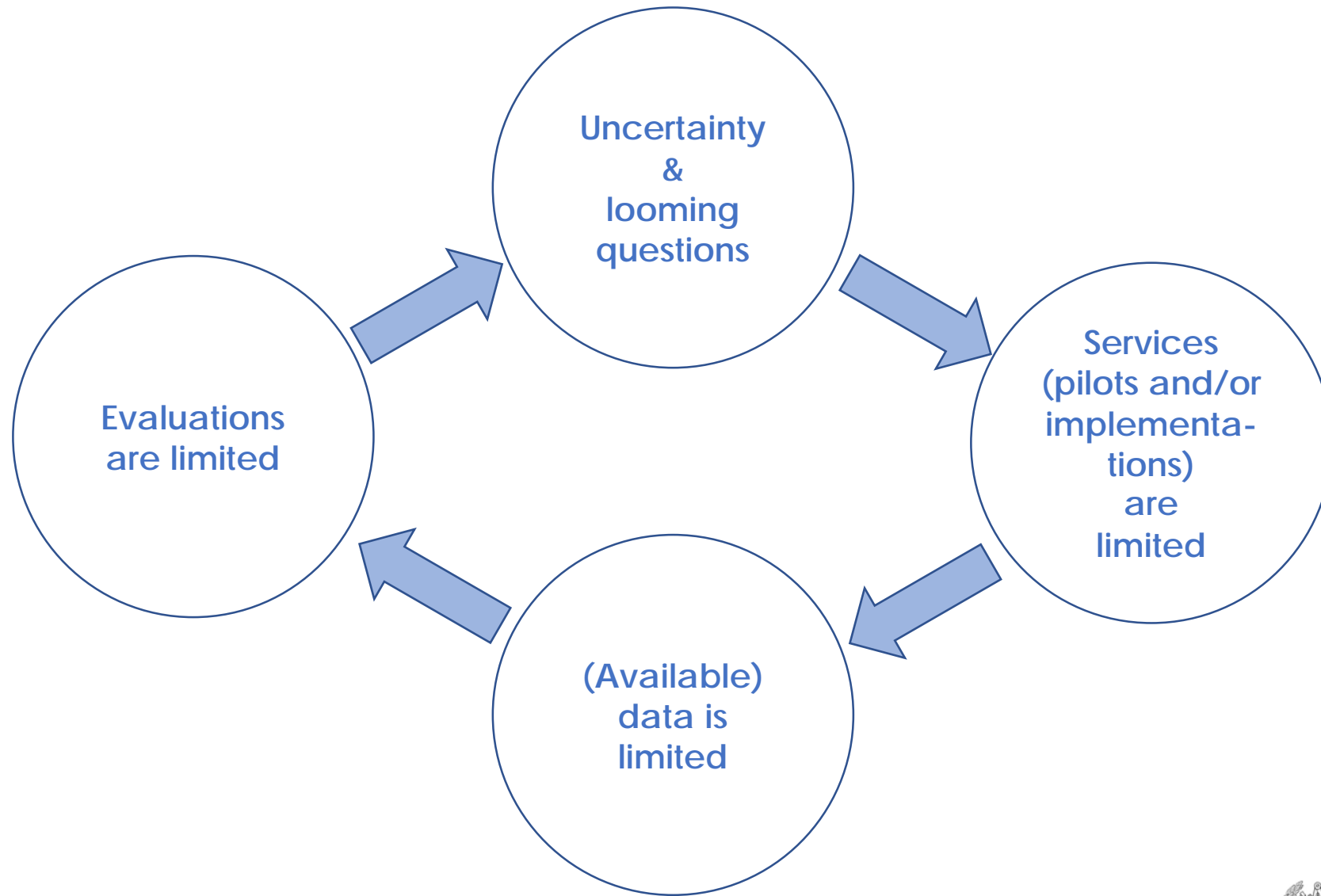
Reference: Sochor, J., et al. (2018) <https://doi.org/10.1016/j.rtbm.2018.12.003>

Levels of Mobility Management (Populus, 2021)



Reference: [Populus Technologies, Inc. \(2021\)](#)

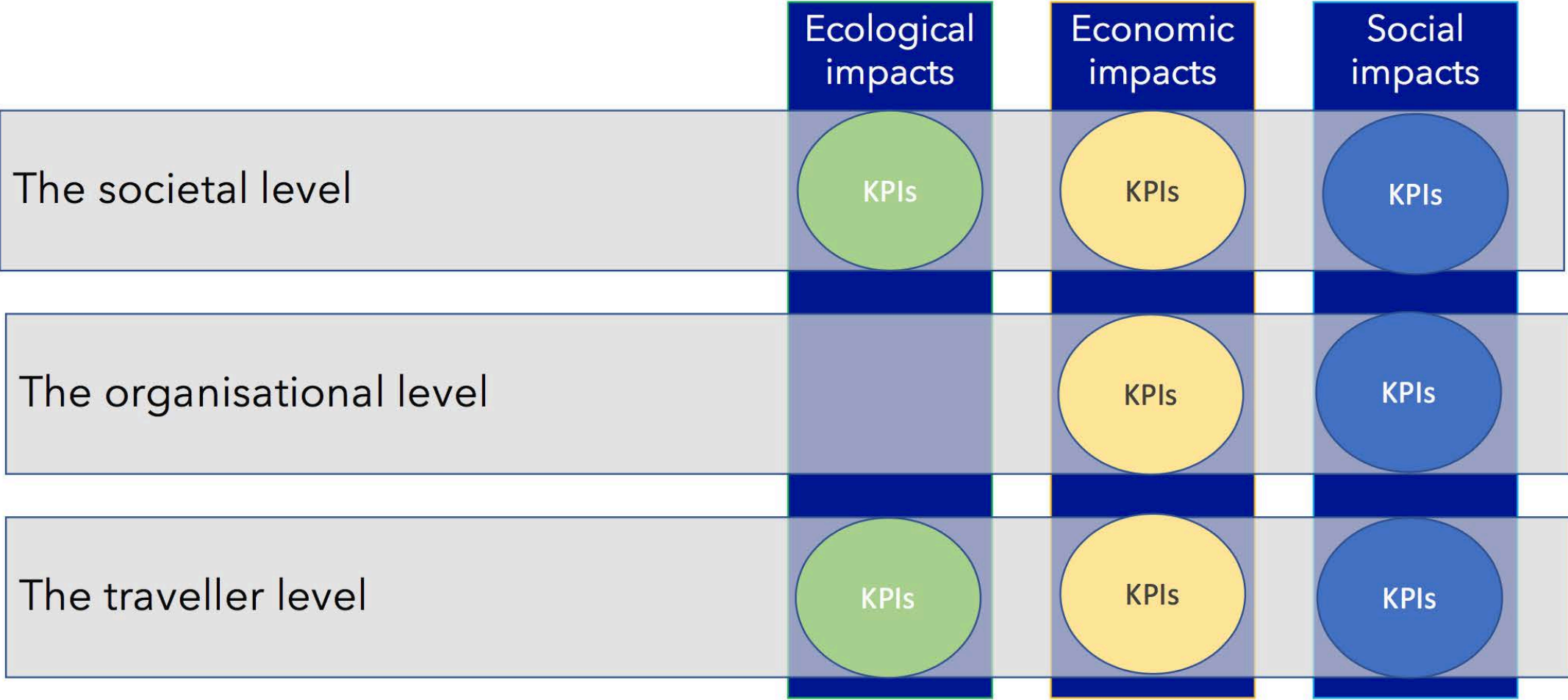
# Breaking out of the uncertainty loop



# Development of a core evaluation framework for mobility services (KOMPIS)

## Building blocks

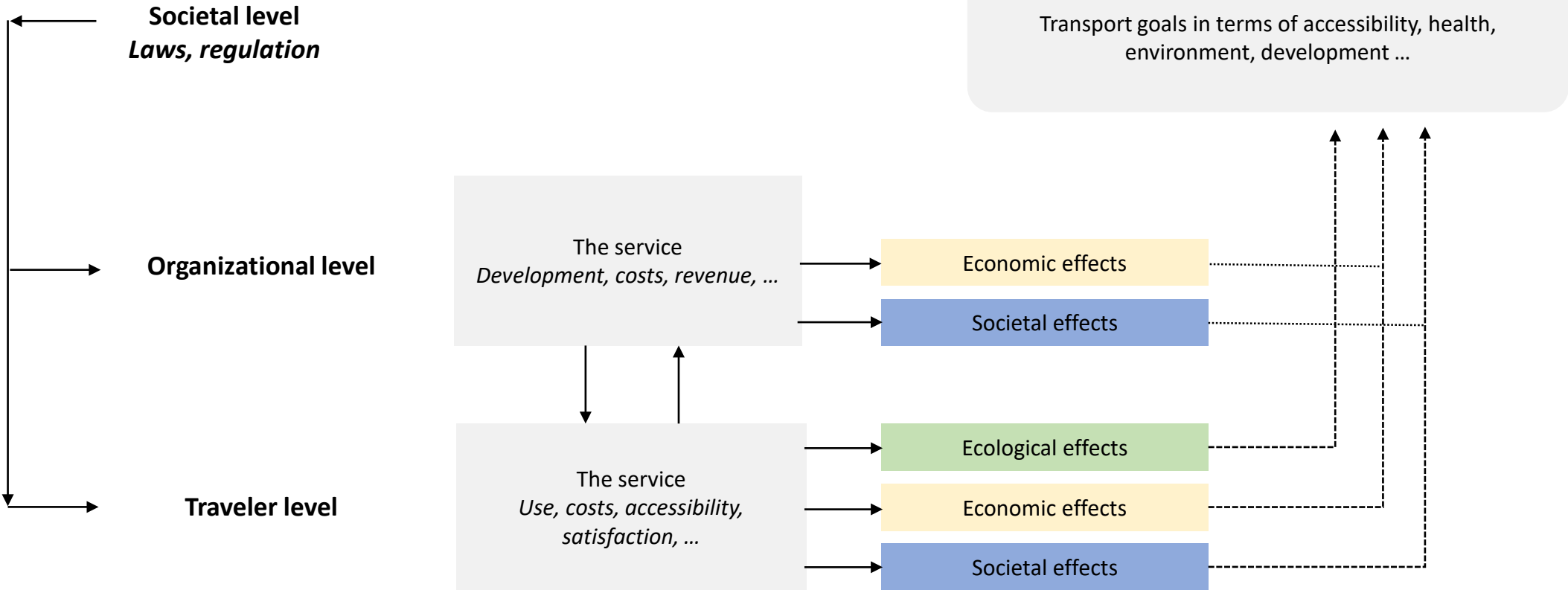
Reference: Karlsson et al. (2020). <http://kompis.me/framework>  
Evaluation framework coordinator MariAnne Karlsson



# Development of a core evaluation framework for mobility services (KOMPIS)

## Overview (models of each level also)

Reference: Karlsson et al. (2020). <http://kompis.me/framework>  
Evaluation framework coordinator MariAnne Karlsson



# A few (of many) questions for decision makers to ponder

How can we change public policies to be more flexible and agile?

- e.g. What is “public transport” and what may it do?

How do we make private/non-shared/fossil-fueled car ownership and use relatively less advantageous?

How can we encourage and incentivize more sustainable travel behaviors for both those who are already relatively more sustainable and those who are still relatively less sustainable?

- via service design, via urban planning, via public policy, etc.

How can we ensure thorough evaluations of MaaS so that we *all* learn more about what works where and why?

- with enough people, over long enough time, in various geographical and legislative/regulatory contexts
- about traveler behavior, sustainability impacts, service design, conflicts and trade-offs between perspectives and types of sustainability, etc.

How can we better support users throughout the adoption process, including trialing new modes and behaviors?

# Thank you!



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## Examples of MaaS implementation and research projects in Sweden

Go:Smart / UbiGo pilot (B2C)  
LIMA (MaaS for employers and employees)  
MoJo (MaaS for employees)  
EC2B at BRF Viva (MaaS integrated into housing)  
Linköping MaaS (city-wide MaaS)  
DalMaaS (rural MaaS)  
KomLand (rural MaaS)  
MaaS Baseline (assessing customer potential in Sweden)

IRIMS (institutional conditions, barriers and enablers)  
KOMPIS (Swedish roadmap + pilot support + evaluation framework)  
SEAMLESS (sustainability meta-analysis of MaaS service data)  
Mistra SAMS research program (Mistra)  
MaaSifIE (European roadmap, CEDR)  
IMOVE (unlocking large-scale access, EU H2020)  
Stronger Combined (MaaS in rural areas in the North Sea Region, Interreg)  
NOMAD (roaming in the Nordic countries, Nordic Innovation)

## MaaS RESOURCES – JOURNALS, BOOK CHAPTERS, DISCUSSION PAPERS

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- MAASiFiE project funded by CEDR <http://www.vtt.fi/sites/maasifie/results> (downloadable deliverables and webinar link+pdf) including:  
Deliverable 2: European MaaS Roadmap 2025.  
Deliverable 3: Business and operator models for MaaS.  
Deliverable 4: Impact Assessment of MaaS.  
Deliverable 5: Technology for MaaS.
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