

# Can MaaS Contribute to Sustainability Goals? Empirical Evidence from the UbiGo Pilot

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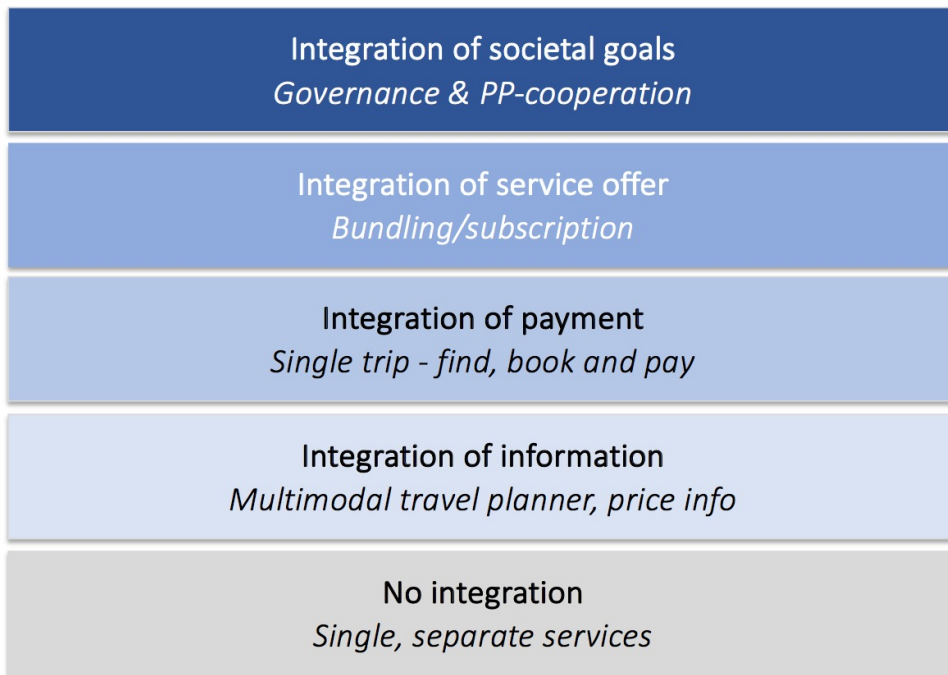
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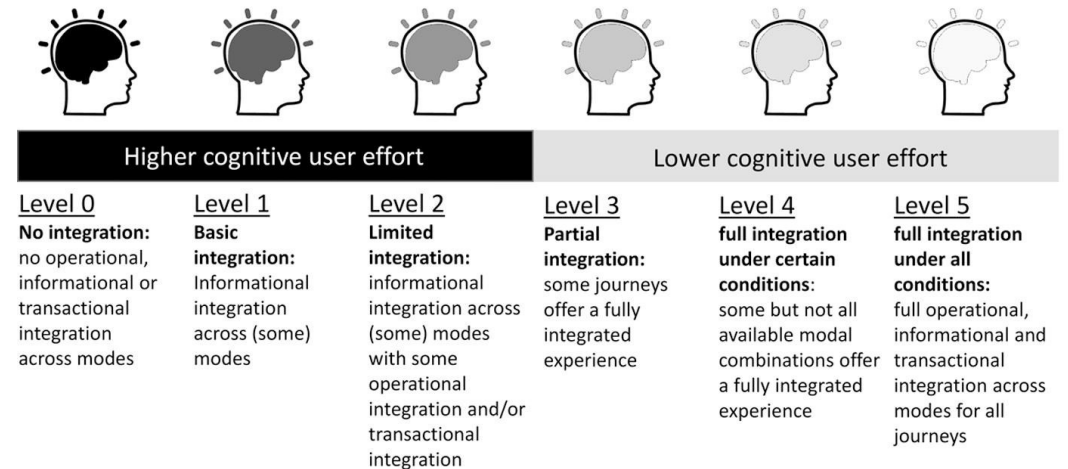
# What is MaaS?

MaaS topology (Sochor et al., 2018)



Reference: [Sochor, J., et al. \(2018\)](#)

MaaS taxonomy (Lyons et al. 2019)



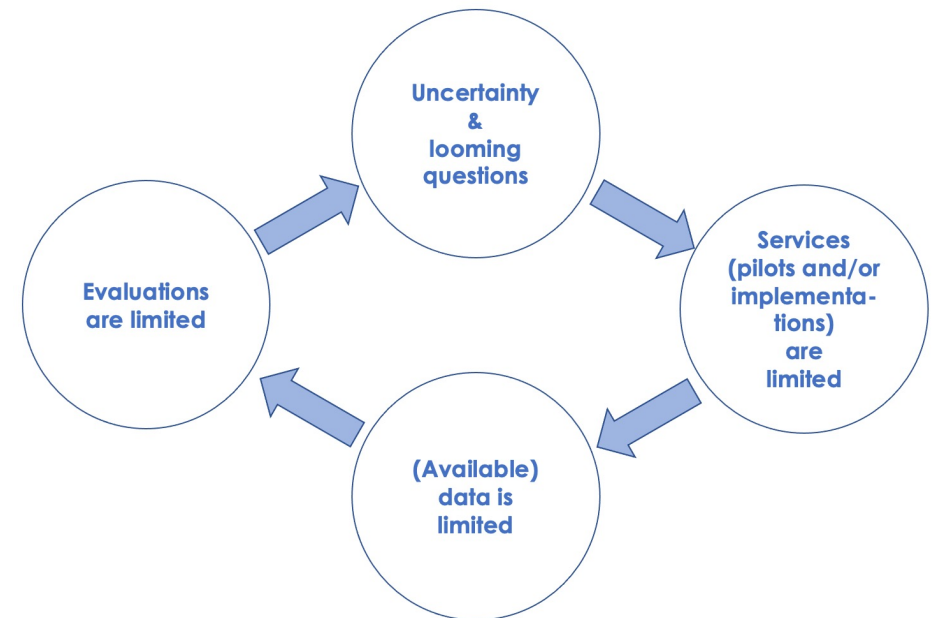
Reference: [Lyons et al. \(2019\)](#) (open access)

# What do we know about MaaS and sustainability?

Not as much as we need to.

We need to break out of the uncertainty loop, as uncertainty begets uncertainty.

- Few large-scale pilots and services
- Few systematic evaluations
- Few before – during – end/after impact analyses
- Few publicly available results
- Lack of common evaluation framework
- Lack of data access



# SEAMLESS project & KOMPIS program

Systematic Evaluations and Assessments of MaaS – Leading towards Sustainable Solutions

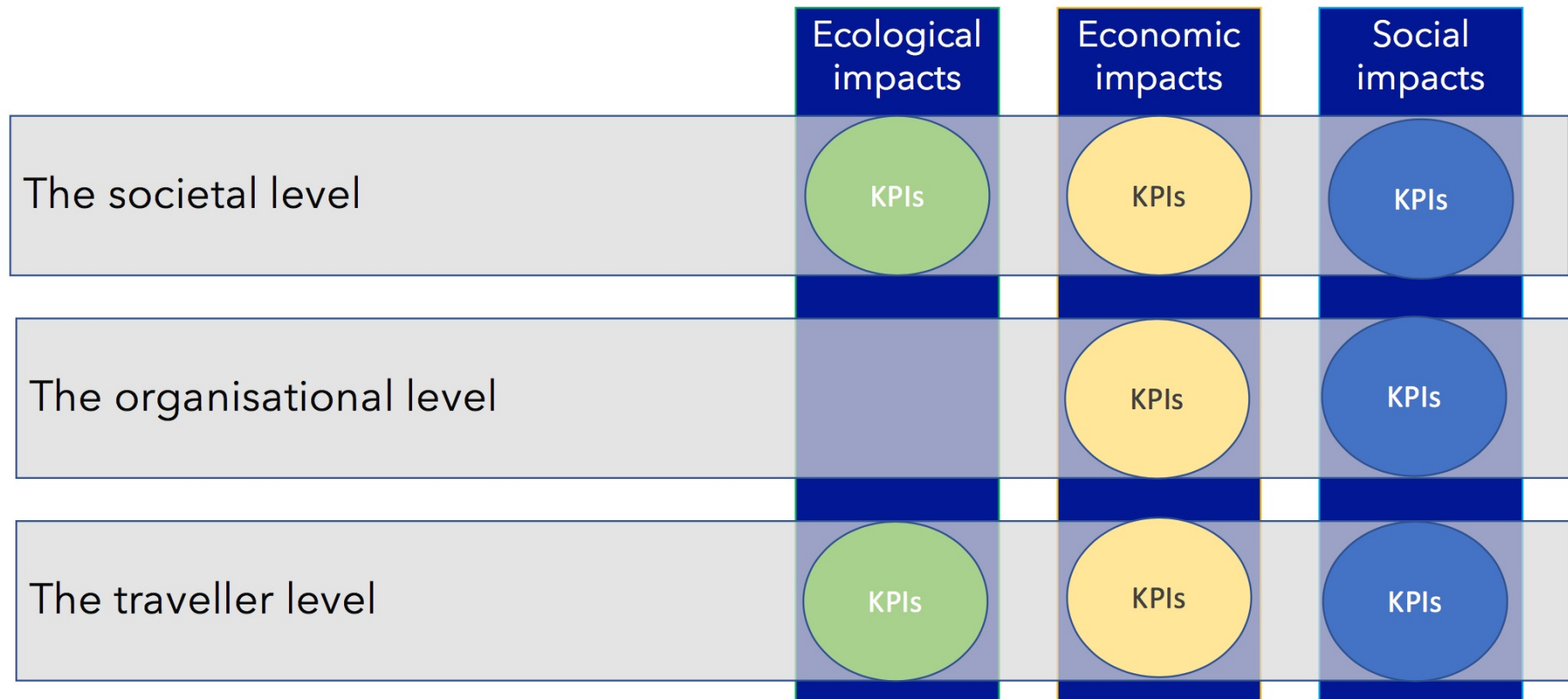
## Abstract

For several years, public officials and private entrepreneurs have sought an understanding of the sustainability impacts of combined mobility services (MaaS). However, there is a lack of empirical data upon which to conduct systematic assessments. Within the KOMPIS programme, an evaluation framework and a national database have been developed to collect data from different pilots of the MaaS concept. SEAMLESS uses this framework to assess environmental, economic and social impacts at three levels – micro (traveller), meso (organisation) and macro (city, region, country). Via quantitative and qualitative analyses of data from different types of MaaS pilots, SEAMLESS will explore how and to what extent MaaS leads to, for example, changed travel behaviour, better accessibility, reduced emissions, increased energy efficiency and financially sustainable business opportunities, generating knowledge that can inform decision-making within both public organisations and among service developers.

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

## Building blocks

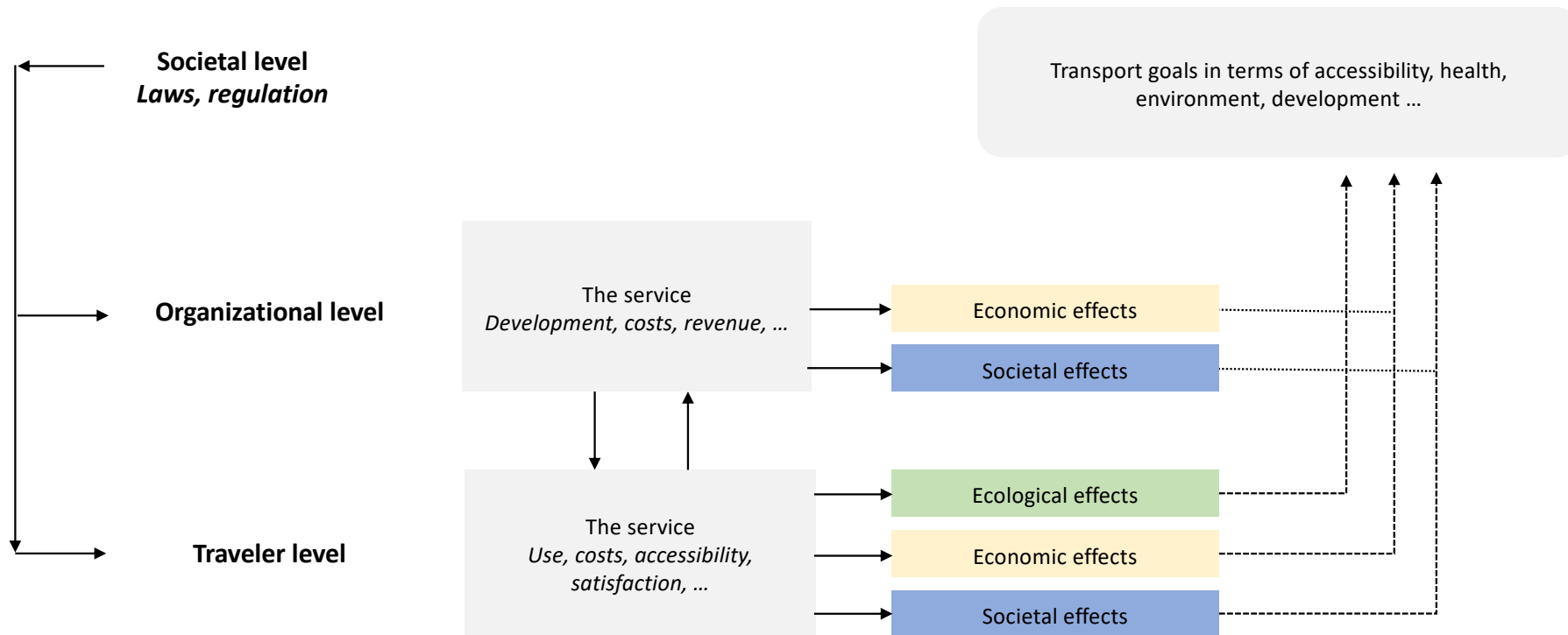
Reference: [Karlsson et al. \(2020\)](#) open access.  
<http://kompis.me/framework> MariAnne Karlsson, coordinator



# 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) open access.  
<http://kompis.me/framework> MariAnne Karlsson, coordinator

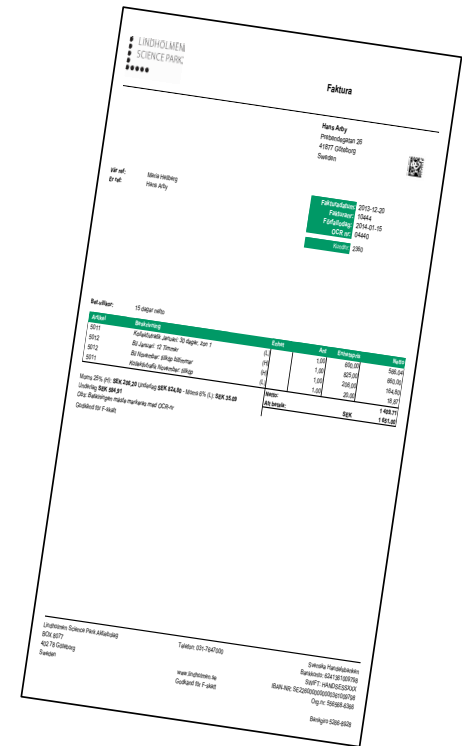
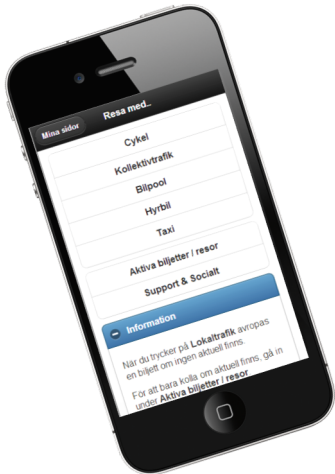


# UbiGo Gothenburg 2013-14 (1) – Overview

World's first commercial pilot of a 'Mobility as a Service' (MaaS) concept (level 3), Go:Smart project (quadruple helix)

**UbiGo**

Real households  
 Real money  
 Real services



# UbiGo Gothenburg 2013-14 (2) – Service, pricing, utilization, incentives

*Still one of the most comprehensive and openly available evaluations of a MaaS service to date*

Household subscription, managed via an app

~200 users / ~80 households for 6 months (Nov 2013-Apr 2014) – no dropouts

20 private vehicles set aside for the duration, 17 from single-vehicle households

Included modes = public transit (daily tickets), carsharing, car rental, taxi, bikesharing

Minimum monthly subscription level for entire household

1200 SEK = ~ 135 EUR or 185 USD at the time of the pilot

The *household* determined their own package combination of daily PT tickets and car hours

Credit could be topped up or rolled over; taxi invoiced at the end of the month

24/7 centralized customer service

**Easier to pay for transportation and keep track of transportation expenditures**

**Fewer lock-in effects** (daily or trip basis vs monthly or ownership basis)

Utilization (monthly averages) – **overestimation of need**

Daily PT tickets: 1920 used vs 2220 purchased (~15% overest.)

Car hours: 620 used vs 904 purchased (~30% overest.)

**Incentives should be tied to the service** (e.g. earned day of free PT)



# UbiGo Gothenburg 2013-14 (3) – Changes in behavior and attitudes

Participants:

- reduced use of (private) car and increased use of other modes.
- stated they could better match mode with trip conditions.
- became less positive towards private car; more positive towards other modes

A majority of participants (64%) reported behavioral changes:

- 43% changed mode
- 34% pre-trip planning
- 21% destination, trip chaining, travel time
- 19% route

Four identified subgroups – all trialed new travel behaviors and shifted towards more sustainable choices

- car owners: *shedders (gave up car); keepers / economizers (kept car)*
- non-owners: *simplifiers (one-stop-shop, already carsharing) accessors (wanted car access)*

Mode	Self-Reported Use and Change in Use Pre-Trial Use (BQ, n = 164); Change in Use (% less – equal – more use) and Change in Attitude Towards (% less – equal – more positive) (EQ, n = 160)
Walk/Run	BQ 36% walk at least 3-5 times/week EQ Walk use change 6% – 73% – 21% EQ Walk attitude change 2% – 82% – 16%
Private Bicycle	BQ 16% use private bicycle at least 3-5 times/week EQ Private bicycle use change 19% – 65% – 16% EQ Private bicycle attitude change 3% – 83% – 14%
Bikesharing	BQ 6% use bikesharing at least 3-5 times/week EQ Bikesharing use change 16% – 61% – 23% EQ Bikesharing attitude change 1% – 57% – 42%
Private Car	BQ 19% use a car at least 3-5 times/week EQ Private vehicle use change 48% – 48% – 4% EQ Private vehicle attitude change 23% – 74% – 3%
Carsharing	BQ n/a, but 35% were carsharing members EQ Carsharing use change 6% – 37% – 57% EQ Carsharing attitude change 3% – 36% – 61%
Car Rental	BQ n/a EQ Car rental use change 13% – 59% – 28% EQ Car rental attitude change 4% – 75% – 21%
Taxi	BQ 1% use taxi at least 3-5 times/week EQ taxi use change 12% – 68% – 20% EQ taxi attitude change 6% – 76% – 18%
Tram	BQ 65% use bus/tram at least 3-5 times/week EQ bus/tram use change 4% – 46% – 50% EQ bus/tram attitude change 2% – 46% – 52%
Bus (Local)	
Bus (Express)	n/a
Train (Local/Long-distance)	BQ 9% use local trains at least 3-5 times/week EQ local train use change 15% – 78% – 7% EQ local train attitude change 3% – 89% – 8%

## UbiGo Gothenburg 2013-14 (4.1) – Travel Diaries

35 individuals, 22 households, before (Oct) and during (Mar), 1 week each  
 Eliminated all trips more than 100km one way (largely covering international trips, work trips, vacation-type trips)

	Before “km”	During “km”	Difference “km”	Before “km share”	During “km share”	Difference “km share”
Total	5687	5425	-263, -5%	n/a	n/a	n/a
Walk	287	243	-44, -15%	5.0%	4.5%	-0.6%
Bike	284	387	+103, +36%	5.0%	7.1%	+2.1%
Private car	2021	1325	-696, -34%	35.5%	24.4%	-11.1%
Shared car	757	920	+163, +22%	13.3%	17.0%	+3.7%
Local Bus	557	745	+188, +34%	9.8%	13.7%	+3.9%
Express Bus	615	942	+327, +53%	10.8%	17.4%	+6.6%
Tram	523	455	-68, -13%	9.2%	8.4%	-0.8%
Train	483	237	-247, -51%	8.5%	4.4%	-4.1%
Other incl. ferry	160	171	+10, +6%	2.8%	3.2%	+0.3%

## UbiGo Gothenburg 2013-14 (4.2) – Travel Diaries

35 individuals, 22 households, before (Oct) and during (Mar), 1 week each  
 Eliminated all trips more than 100km one way (largely covering international trips, work trips, vacation-type trips)

	Before “km”	During “km”	Difference “km”	Before “km share”	During “km share”	Difference “km share”
Total	5687	5425	-263, -5%	n/a	n/a	n/a
Walk	287	243	-44, -15%	5.0%	4.5%	-0.6%
Bike	284	387	+103, +36%	5.0%	7.1%	+2.1%
Car	2778	2245	-533, -19%	48.8%	41.4%	-7.5%
Bus, tram, train	2179	2379	+201, +9%	38.3%	43.9%	+5.6%
Other incl. ferry	160	171	+10, +6%	2.8%	3.2%	+0.3%

# UbiGo Gothenburg 2013-14 (5) – Motives and satisfaction

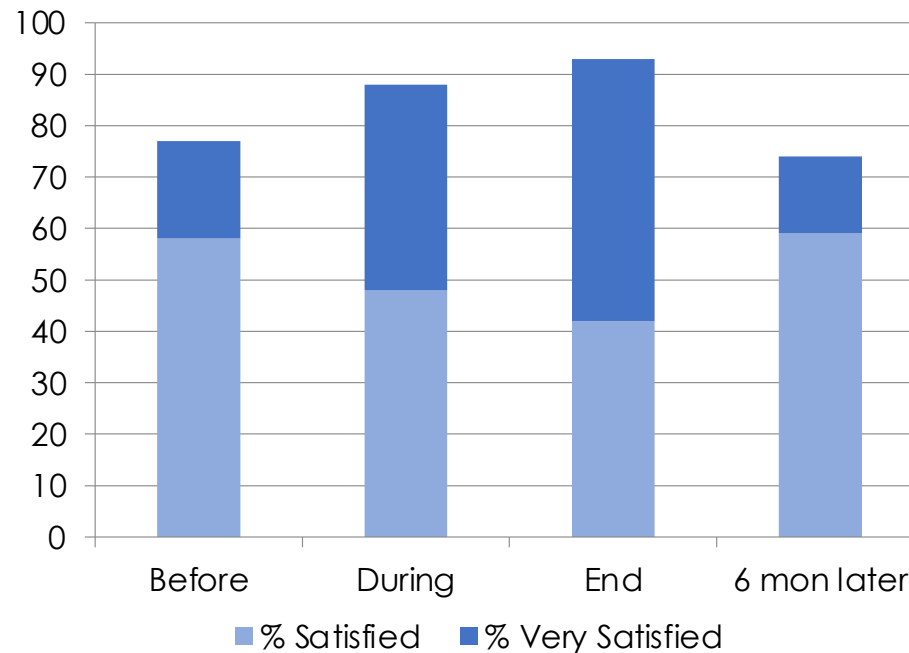
*Motives: curiosity attracted customers, but convenience, flexibility, economic savings retained customers*

Participants became more satisfied with their transport.

No differences in satisfaction between subgroups.

97% wanted to keep using the service after the pilot ended

*“It’s noticeable now that we’re not in [UbiGo anymore] that it’s like ..., it feels awkward to travel in the usual way.”*



## UbiGo Gothenburg 2013-14 (6) – Contributing factors

“Transportation smorgasbord” concept

Simplicity

Improved access

Improved flexibility

Economy

Added value / Relative benefit

Trialability

New insights on convenience

*“It’s not about being a bus user or a pedestrian or; it’s that you’re everything. And having reasonable proportions of each [mode]. To be able to see when I need one and when I need the other. And that was really important. ... And the threshold was low enough to easily cross, to see what [mode] is good for me today?”*

**91% agree that “UbiGo or similar services are important for one to dare to try to change one’s lifestyle and travel behavior”**

# The technology is a tool, not a goal

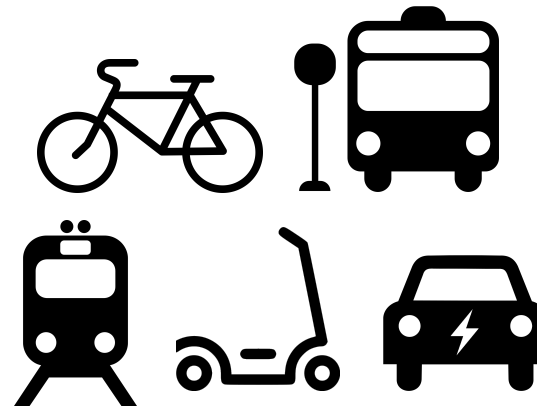
*Mobility is more than modes of transport, and seamless / integrated mobility services entail more than a technical interface overlaying those modes.*

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

Customer segment?



Modes? Bundle?

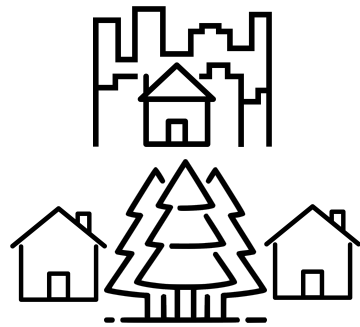


# The technology is a tool, not a goal

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

## A more systematic approach – the "user" in a societal context

Geographic context



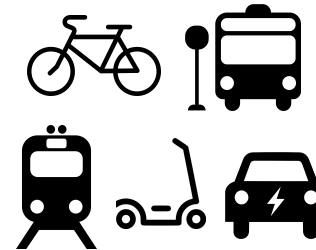
Infrastructure & mode access  
Costs of living  
Weather  
...

Family / household context



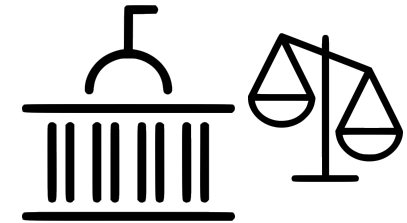
Financial resources  
(Mode) ownership  
Abilities  
Knowledge, habits  
Stress  
Identity, values  
Competing needs  
Others' demands e.g. employers' demands  
...

Service & org. context  
(Value proposition)



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

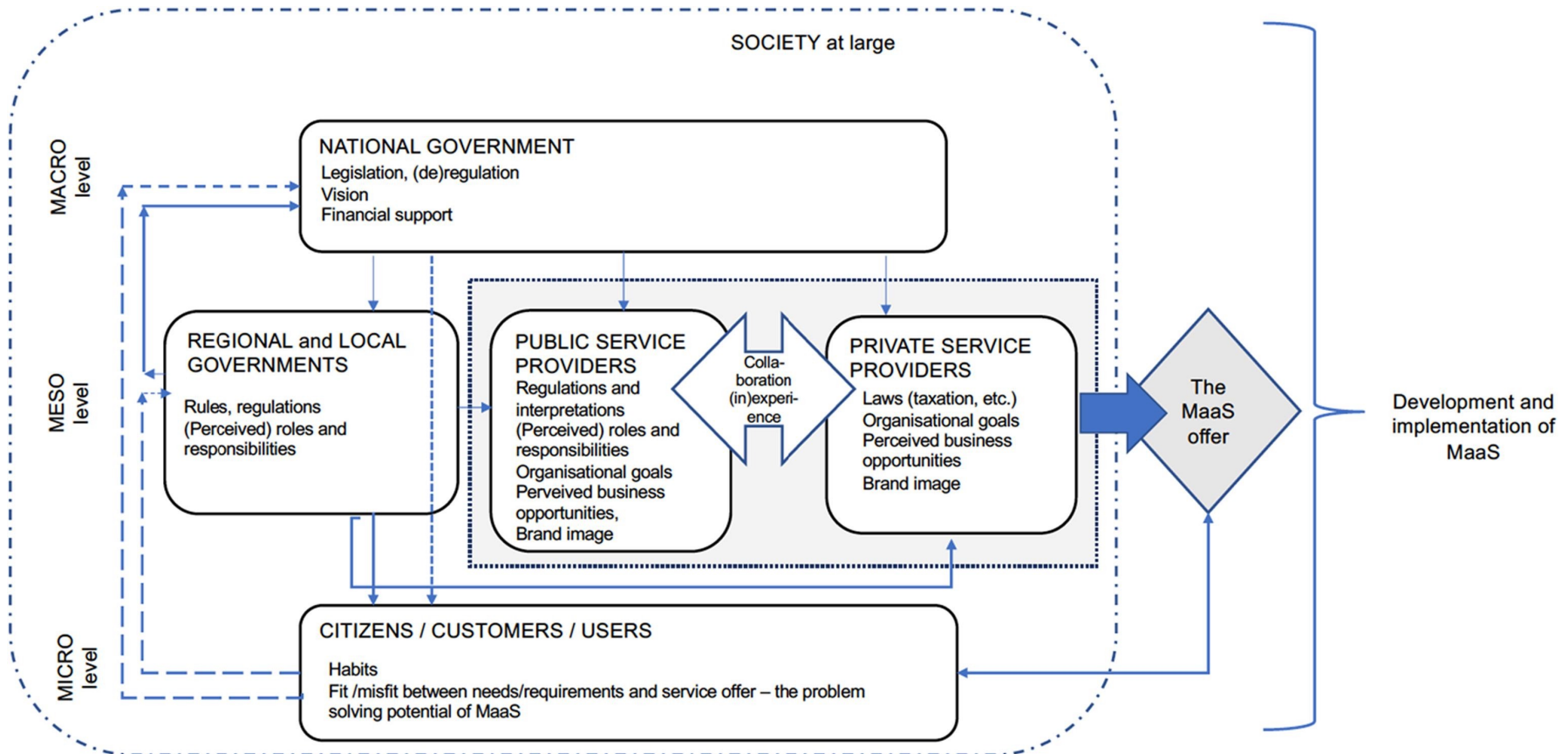
Societal, legal & regulatory contexts



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

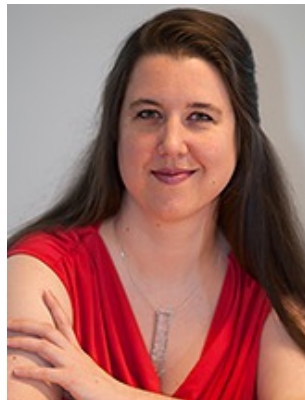
# Implementing Mobility as a Service is complex

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





# 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)  
ScaniaGo (MaaS for employees)  
EC2B at BRF Viva (MaaS integrated into housing)  
MaaS in Skåne (regional MaaS)  
Linköping MaaS (city-wide MaaS)  
DalMaaS (rural MaaS)  
KomLand (rural MaaS)  
FjällMaaS (MaaS for tourists)

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), including:  
    Workhub; Living Lab in Riksten (suburban MaaS, etc.)  
MaaS Baseline (assessing customer potential in Sweden)  
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 – JOURNAL ARTICLES, BOOK CHAPTERS, DISCUSSION PAPERS

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## MaaS RESOURCES – THESES, REPORTS AND WORKING PAPERS

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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.
- Mukhtar-Landgren, D., Karlsson, M., Koglin, T., Kronsell, A., Lund, E., Sarasini, S., **Sochor, J.** & Wendle, B. (2016) Institutional conditions for integrated mobility services (IMS). Towards a framework for analysis. K2 Working paper 2016:16. [http://www.k2centrum.se/sites/default/files/fields/field\\_uppladdad\\_rapport/institutional\\_conditions\\_for\\_integrated\\_mobility\\_services\\_ims\\_wp\\_2016-16\\_1.pdf](http://www.k2centrum.se/sites/default/files/fields/field_uppladdad_rapport/institutional_conditions_for_integrated_mobility_services_ims_wp_2016-16_1.pdf)
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- **Sochor, J.** and Sarasini, S. (2017) "More than the sum of its parts? The Finnish Public's Perspectives on Mobility as a Service and ITS". 12th European Congress on Intelligent Transportation Systems (Strasbourg, June 19-22, 2017).
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