



Challenges in the Paradigm Change from Mobility as a Self-service to Mobility as a Service

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Motivation, purpose and expected results

- Motivation
 - We are in a *mobility as a self-service* mode - what are the challenges for a paradigm change to MaaS?
- Purpose
 - To analyse the potential and challenges of MaaS against current situation in demographics, mobility and mobility related consumption in Finland
- Expected results
 - Recognising the potential and challenging customer segments from MaaS perspective and discussing how MaaS schemes could address these different segments and reflect Finnish demographics, mobility practises and consumption patterns



Outline of the presentation

- Data and methods
- Defining Mobility as a Service
- Previous research and the approach of this study
- MaaS and Finland, analysis of potential and challenging
 - geographical areas
 - age groups
 - current mobility patterns
 - households
- Discussion and conclusions



Data and methods

- Literature study to
 - Define MaaS
 - Describe previous research relevant to the subject
- Analysing the paradigm changes needed
 - Current state against MaaS model
- Analysis on statistics and data
 - Population data from Statistics Finland
 - National travel survey 2010 - 2011 from Finnish Transport Agency
 - Household consumption in 2012 and 2016 from Statistics Finland with a special focus on households' spending on transport and mobility



Mobility as a service (MaaS)

- No one definition of MaaS (Hoadley 2017)
- System where mobility operators provide a **comprehensive range of mobility services** to the customers (Heikkilä 2014)
- “**Multimodal** and **sustainable** mobility services addressing customers’ transport needs by **integrating planning and payment** on a one-stop-shop principle” (König et al. 2016 [MaaSIFiE project])
- “**Using a digital interface to source and manage the provision** of a transport related service(s) which meets the mobility requirements of a customer” (TSC 2016)



Personalised mobility and MaaS

- MaaS seeks to offer a personalised mobility service to meet the travellers' needs (Hoadley 2017)
- There will be no one MaaS model that fits all (TSC 2016)
 - Demand side: different customer needs
 - Supply side: many stakeholders, different areas
- MaaS can be a bundle of different services for an individual or e.g. a household (TSC 2016)
- Critical question (TSC 2016): What type of MaaS do the policy makers want to see grow?
 - Unwanted mode shift from public transport is possible



Previous research on the potential and challenges of MaaS

- Only a few studies on the potential and challenges of MaaS, none recognised with a similar approach
- As the early adopters, new millennials are likely MaaS consumers (TSC 2016)
- Men and high-income groups are estimated to have a positive attitude towards new technology (El Zarwi et al. 2017)
- Potential groups for car-sharing are young and highly educated people (Becker et al. 2017)
- Car sharing is analysed to appeal to social activists, environmental protectors, innovators, economizers and practical travellers (Burkhardt & Millard-Bal 2006)



Starting point for analysing potential and challenges of MaaS

- Here, MaaS = a truly multimodal service: taxis, carshare, rideshare, passenger service vehicles and traditional public transport
- The available services are expected to differ
 - Between urban and rural areas
 - Between cities of different sizes
 - Depending on the urban structure, e.g. city centre vs. suburban area
- Greatest MaaS potential is expected in the biggest cities
 - Wide selection of different transport modes and services
 - Transport demand can support commercial MaaS schemes
- MaaS schemes in rural areas can be very limited in terms of different services bundled
 - The services in rural areas may need more public support
 - MaaS can contribute to the livelihood of the area with lower costs with the help of more responsive transport services (Rantasila 2016)

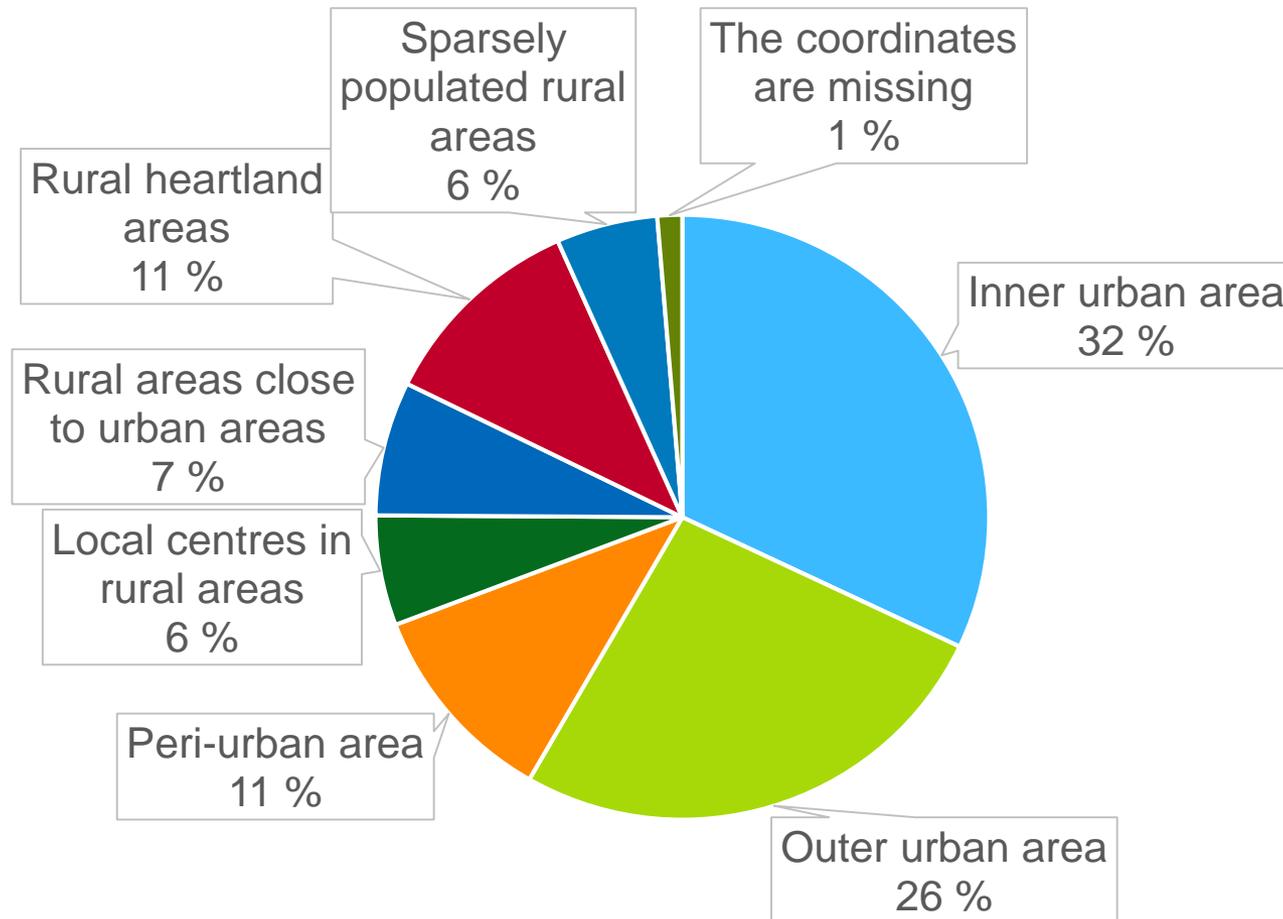


Current state of demographics and mobility in Finland

- Small population: 5.5 million in 2017
- Large land area => low population density of 18.1 inhabitants per square kilometer
- Only one larger metropolitan area (MA), Helsinki with 1.5 million inhabitants, and additionally six cities with above hundred thousand inhabitants in Finland
 - Helsinki MA is the most obvious MaaS market in Finland, yet there MaaS trials have also emerged in smaller cities, e.g. Seinäjoki (62,000 inhabitants) and even in Ylläs in Kolari with 3,800 inhabitants
- 58% of trips and 72% of kilometres travelled by private car in 2011 (Finnish Transport Agency 2017)



The share of population in different areas in 2015 in Finland



The share of population in different areas in 2015 in Finland

Very little or no public transport and possibilities to economics of scale - solutions from shared mobility?

The coordinates are missing 1 %

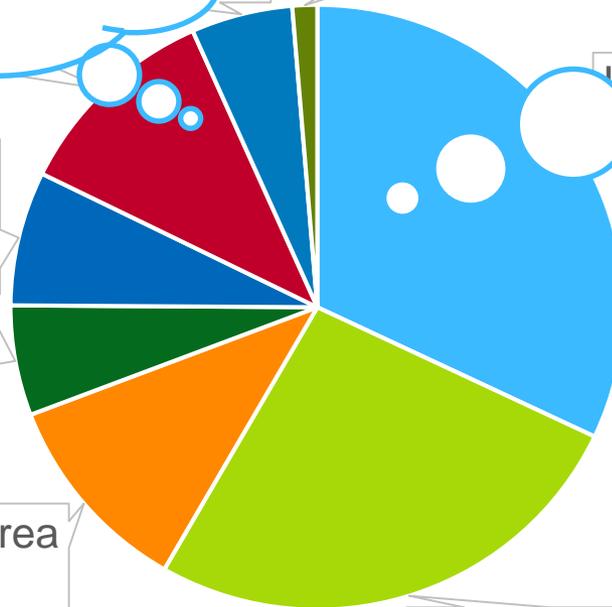
- 1.8 M people
=> greatest potential for MaaS
- dense population
 - many transport options
 - (no or) low need for car ownership

Rural areas close to urban areas 7 %

Local centres in rural areas 6 %

Peri-urban area 11 %

Outer urban area 26 %



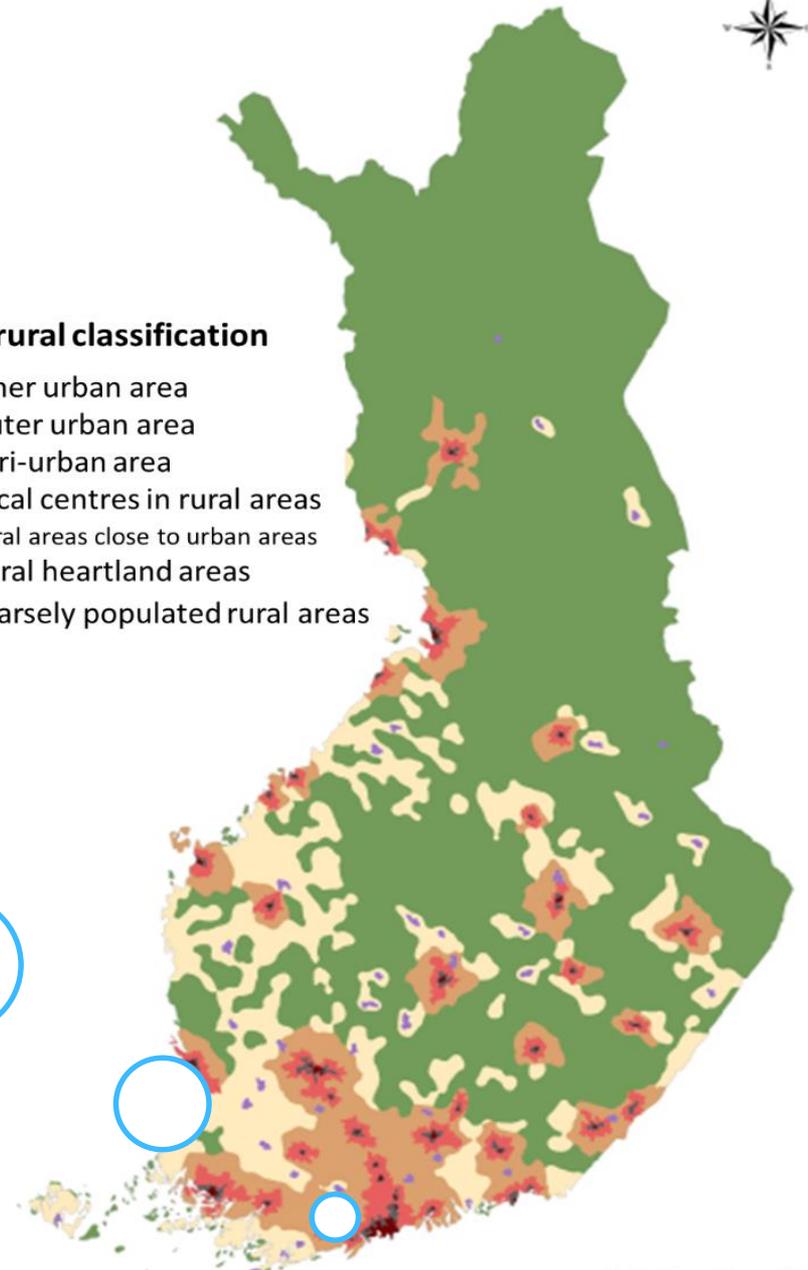
Continuing urbanisation

Larger transport corridors and longer commuting trips

Need for MaaS including also the areas outside the urban core

Urban-rural classification

- Inner urban area
- Outer urban area
- Peri-urban area
- Local centres in rural areas
- Rural areas close to urban areas
- Rural heartland areas
- Sparsely populated rural areas



Population in different areas and in different age groups in 2015 in Finland

Share of total population	under 15 years old	15 - 24 years old	25 - 64 years old	65+ years old	Total population
Urban areas	11.4 %	8.7 %	36.3 %	12.8 %	69.2 %
Rural areas	4.8 %	2.8 %	14.4 %	7.5 %	29.5 %
Unknown coordinates	0.2 %	0.2 %	0.8 %	0.1 %	1.3 %
Total	16.3 %	11.7 %	51.5 %	20.5 %	100.0 %

- 25 - 64 years old, the largest age group in terms of population
 - Likely to be relatively locked to their mobility practises - challenge for MaaS
- 65+ years old
 - Amount of people and the share is growing, relatively many live in rural areas
 - How can MaaS serve this population? Removing not only the need to own, but also to drive a car? Assistance to use the services, both virtually and physically?
- Under 15 years old
 - MaaS solution should acknowledge that many of children's trips are done together with their parents => a service pack including services for the whole family and modes that serve the children, e.g. bikes or hoverboards



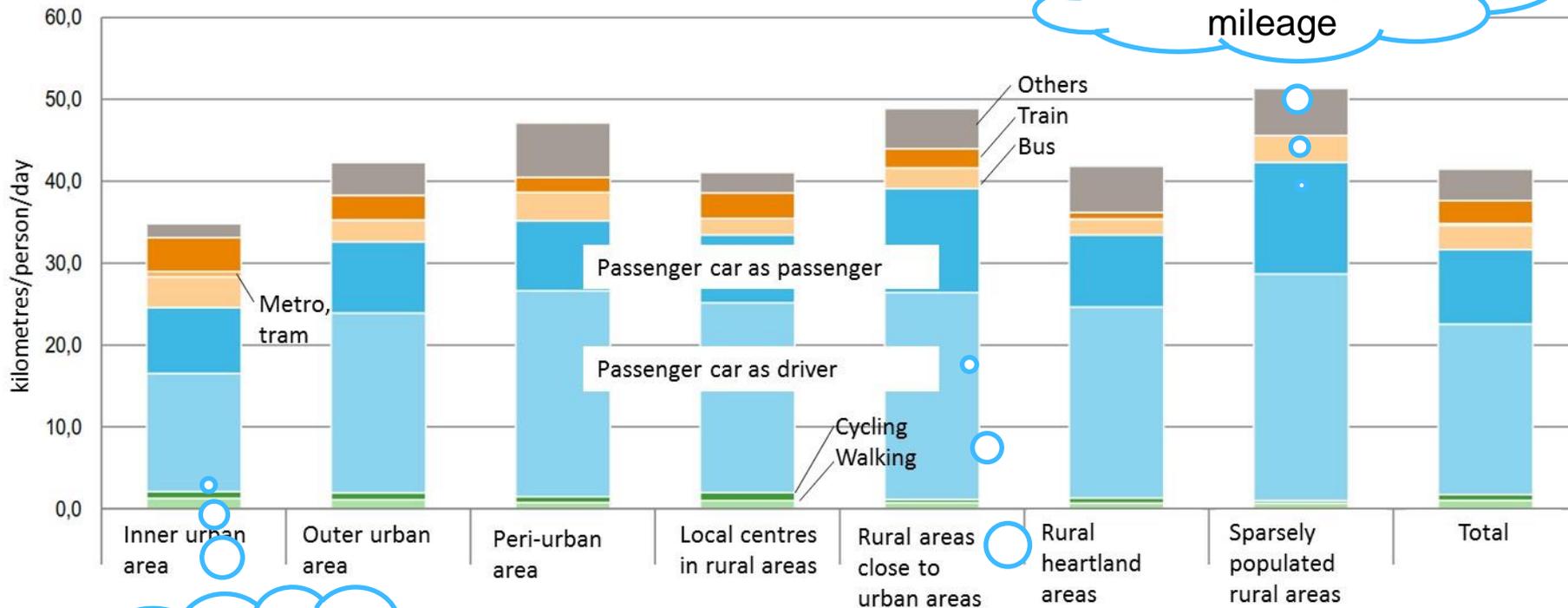
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- 15 - 24 years old
 - More commonly urban dwellers
 - Main mode is already passenger car as driver (29%), but not as clearly as for the older generations who do more than 50% of their trips as car drivers
 - The share of public transport is the highest in this age group indicating a high potential from the MaaS perspective - already familiar to using mobility services
 - People in this group do not own cars to a high degree
 - E.g. in Helsinki people are getting less driving licences when turning 18
 - Every year about 60,000 Finns reach the age of 18 and make decisions on whether to get the driving licence and a private car or not



Average passenger mileage by mode in different types of urban and rural areas in Finland in 2010-2011



Most modes available, smallest mileage

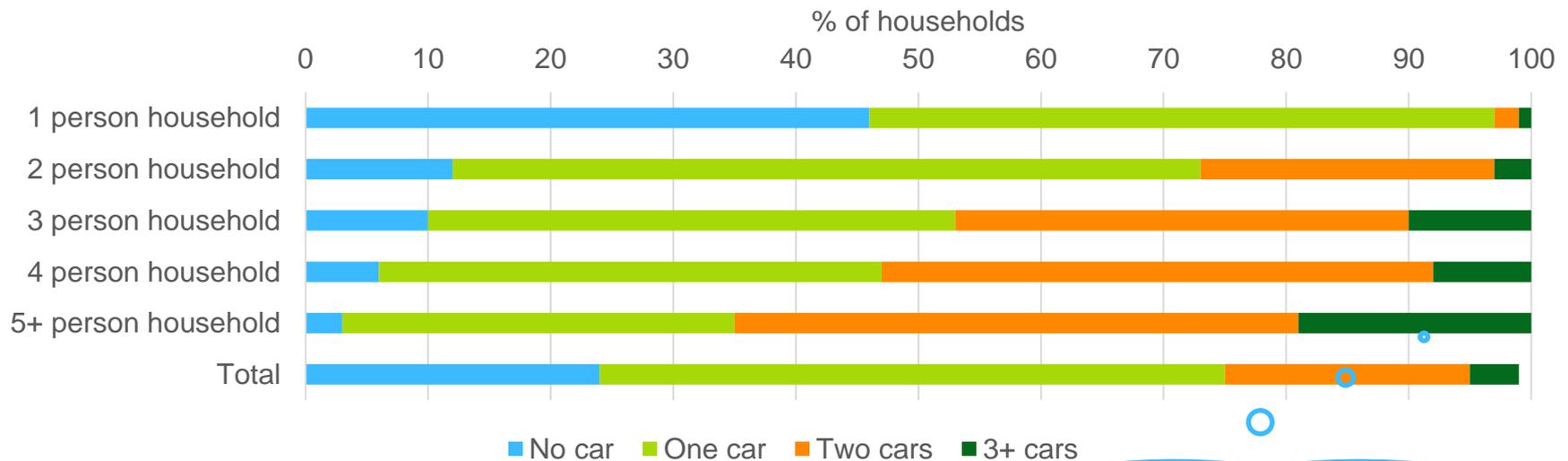
Least modes available, highest mileage

Drivers are very attached to using their vehicles (Tertoolen et al. 1998)
=> Challenge for MaaS, bigger potential in users of other modes?



The household perspective

- There were 2.56 million households in Finland in 2012
- 74% of Finnish households had a car in use in 2012
- Almost half of the one-person households do not have a car in use
- The number of one- and two-person households is growing => rising MaaS potential especially in the younger households where the car ownership had levelled off between 2006 and 2012



Could the multicar-households give up one of their cars and use MaaS instead?

Household consumption

- Finnish households consumed 19.0 billion euros on mobility in 2012, of this 15.1 billion was linked to passenger cars and their use
- The share of expenditure on transport was **17%** of all household consumption (e.g. in UK the share was 14% in 2016)
- On average, the households used **509 euros a month transport** (in UK 360 € a month in 2016)
- MaaS **could cause a redistribution of the current consumption** on mobility or it **could generate new expenditure** (TSC 2016).
- A Finnish survey (Solita 2017) indicate a low willingness to pay for a monthly package covering all the mobility needs. On average, the respondents were willing to pay less than 150 euros a month **BUT 10% of the respondents were willing to pay more than 400 euros => highly interesting from MaaS point of view!**



Should MaaS aim at high-income or low-income customers?

- More money is spent on transport the higher the income is, and as the income level grows, also transport's share of consumption grows.
- The households with the highest consumption on transport (and solid financial standing) is a very interesting from MaaS point of view
- Households without a car are interesting, even if these households have often low income
 - The challenge is to be able to generate enough revenue with the low-income households to offer a comprehensive service meeting the customer needs.
- A key issue is to be able to show the true costs of car use which are often hard to be aware of and perceive. In the study by Tertoolen et al. (1998) it was seen that giving individually relevant information on the costs of car use leads to a higher estimate of own car costs.



Is Finland ready for services?

- Share of transport expenditure on mobility services in Finland 13% vs. UK 22%



Discussion

- Focus was on statistics and data on the current situation - to what extent do these reflect the future?
- The statistics miss out e.g. the development of different lifestyles (e.g. LOHAS and LOVOS) which can be strong drivers for change
 - sustainability challenge: car-driving is clearly more tempting and include less inconvenience compared to sustainable mobility (Aro 2016)
 - simplicity (e.g. no ownership)
- MaaS trials have proved that substantial changes are possible. In the case of UbiGo, changes in travel behaviour were reported by 64 % of the participants, including decreases in private car use and increases particularly in the use of car sharing and bus and tram (Karlsson et al. 2016).



Conclusions

- Potential and challenges in terms of geographical area, demographics and households, e.g. income levels were discussed
- Potential
 - Adults, families with children
 - Youngsters and young adults
 - Urban areas (transport services available, dense population, ...)
 - One- and two-person households
 - High income ...but even low income households
- Challenges
 - Rural areas - how could shared mobility be a part of MaaS?
 - Seniors - assistance both virtually and physically
 - Multicar families - bringing out the options and true costs of car use
 - How can MaaS be more tempting than self-service and own car use?



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