



US
UNIVERSITY
OF SUSSEX

SPRU
SCIENCE POLICY
RESEARCH UNIT



Long-term dynamics between disruptive innovation and transformative innovation policy: Emergence and consolidation of mobility-as-a-service

Paula Kivimaa, Laur Kanger & Johan Schot

Science Policy Research Unit (SPRU), University of Sussex



Introduction

- Disruptive innovation recently connected to discussions about the transformation of societies towards sustainability (e.g. Dijk et al., 2016; Wilson & Tyfield, 2016)
 - To what extent can this initially ‘technology-oriented’ concept be useful for the discussion of broader transformation?
 - More specifically, little insights exist how disruptive service-oriented business model innovations link to broader innovation policy and institutional change
- Increasing calls for transformative innovation policy (Steward, 2012; Weber & Rohracher, 2012; Schot & Steinmueller, 2016)
 - What such transformative policy entails is work in progress
 - To what degree does this involve ‘disruptive’ processes to present socio-technical systems or institutional systems?
 - Can we ‘design’ policy mixes in support of transformation, and what do they look like?

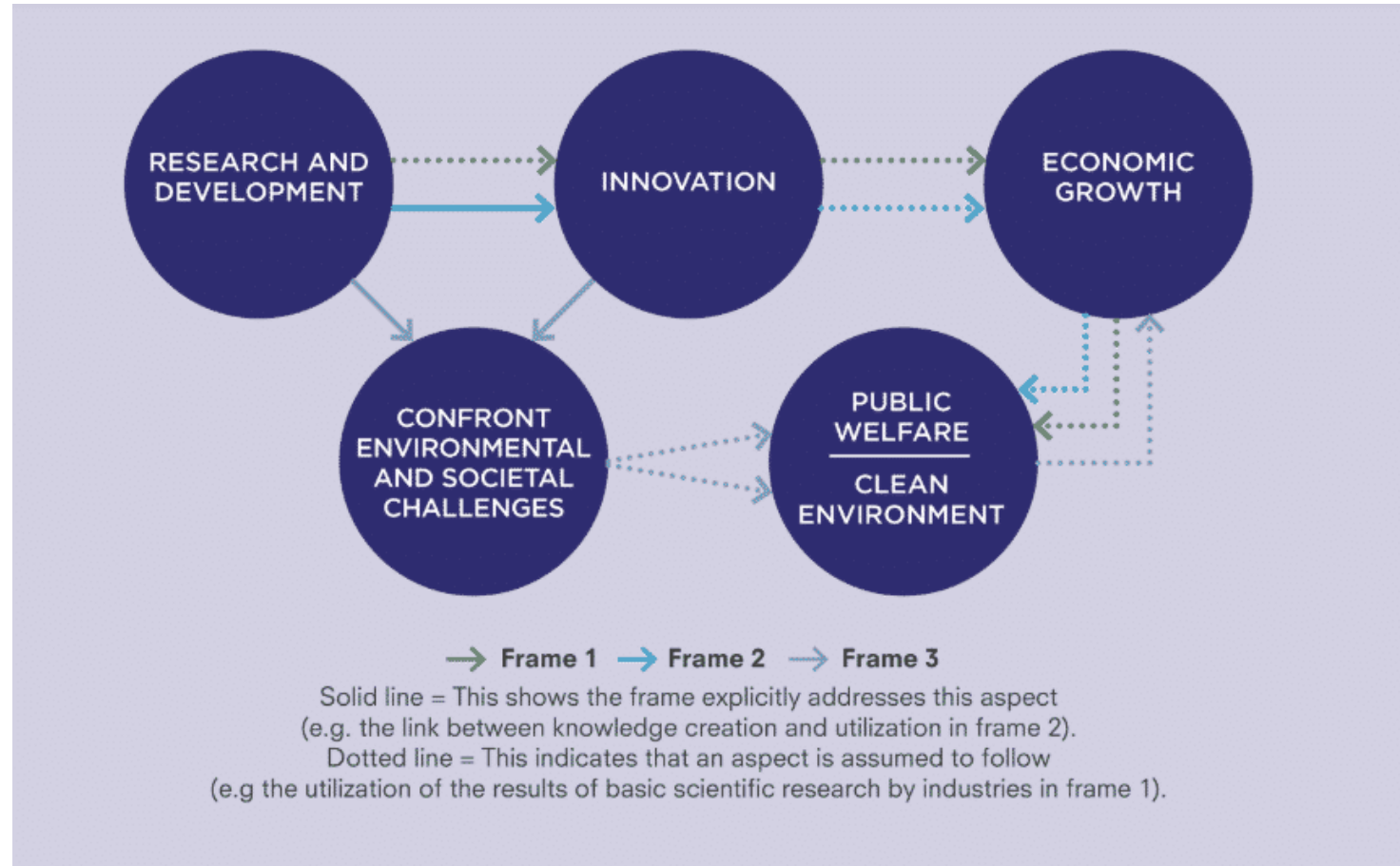
Disruptive innovation

- Traditionally understood as disruptive technology (to firms) that bring forward a different value proposition (Christensen, 1997).
 - It “changes the technology in a way that imposes requirements that the existing resources, skills and knowledge satisfy poorly or not at all” (Abernathy & Clark, 1985, p. 6)
- In the context of transitions a broader understanding going beyond technology has recently emerged, e.g.
 - Disrupting market institutions (Dijk et al., 2016)
 - Disruptive policy mixes (Kivimaa & Kern, 2016)
 - Addressing disruption in markets, ownership structures and institutional change (Johnstone et al., 2018)
 - Sociotechnical transition processes open up space for disruptive innovation (Wilson, 2018)

Transformative innovation policy

- Increasing calls for innovation policy to address grand challenges (e.g. Steward 2012; Schot & Steinmueller, 2016; Kuhlmann & Rip 2018)
 - E.g. climate change, resource exhaustion, income-distribution inequities and the persistence of exclusion and poverty (Steinmueller, 2018)
- Transformative innovation policy proposed as a third frame of innovation policy (Schot & Steinmueller, 2016)
- A need for transformative policy mixes has been expressed (Kivimaa & Kern, 2016; Rogge et al., 2017; Raven & Walrave, 2018)
- BUT:
 - How does TEP link to (1) the variety of challenges, (2) different country contexts, (3) connections between innovation policy and sectoral policy domains, (4) experimentation and (5) institutional change.

Three frames of transformative innovation policy



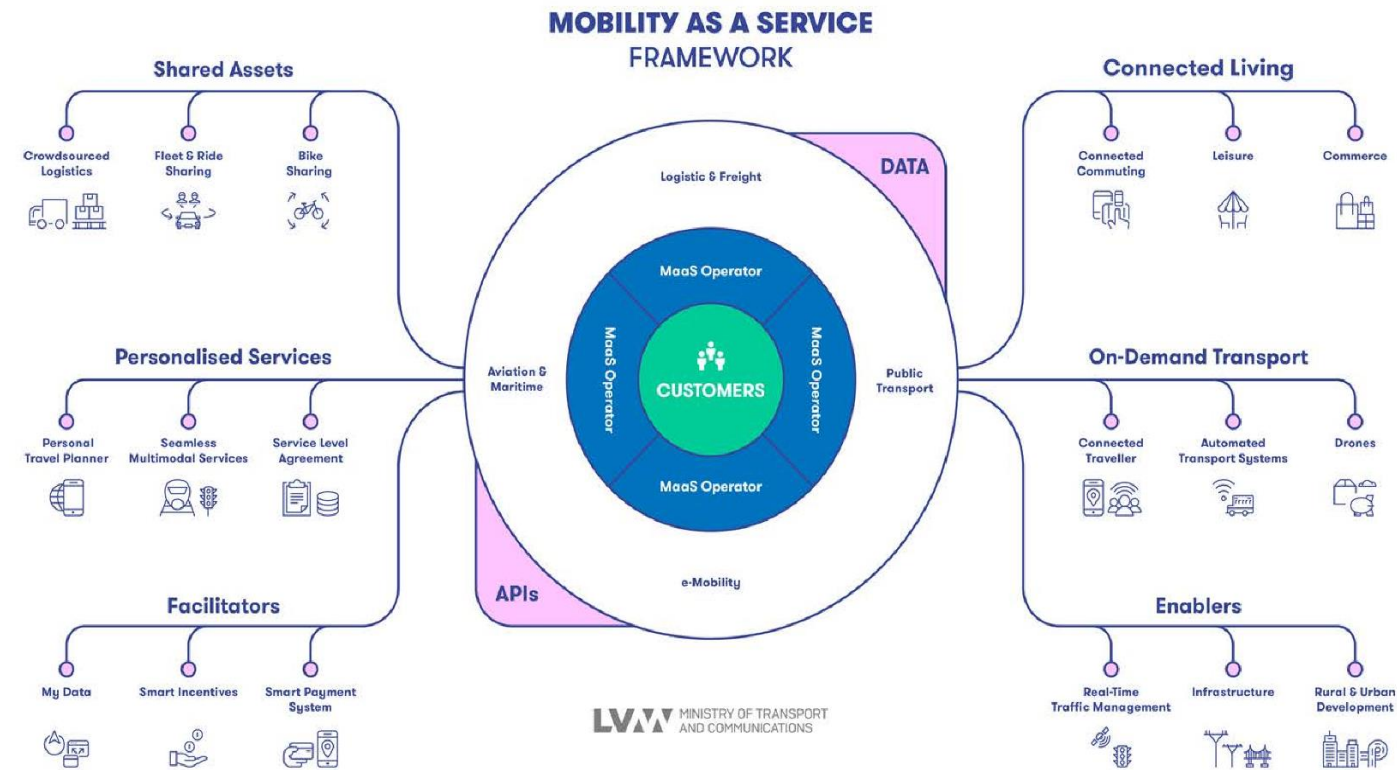
Case study: mobility as a service in Finland

- Transformative innovation policy pilot case: Innovation co-creation
 - Workshop in May 2017 and feedback to initial findings
- Interviews
 - May-June 2017
 - Autumn 2018 (progress & institutional change)
- Document analysis
 - Government websites
 - Policy programmes and legal texts



Maas as disruptive innovation?

- From individual ownership of cars to personalised services and shared assets
- Potential for sustainability transformation if replaces the fossil fuel combustion engine based private transport system
- Dependent on
 - Other transition paths (smart mobility, electric vehicles)
 - Scale and nature of application

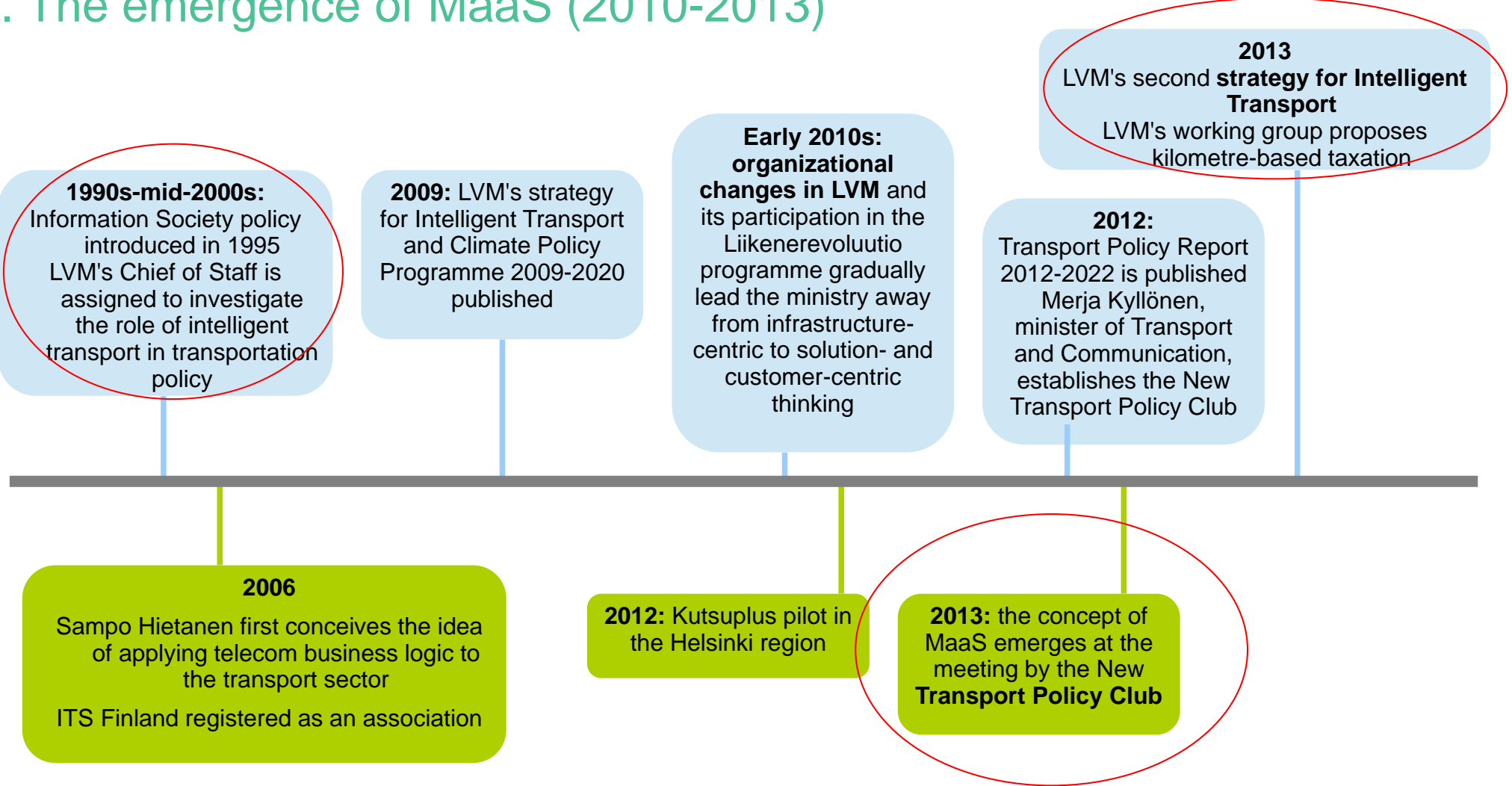


A brief history of MaaS I

1. Intelligent transport: from re-orientation of vision to strategy formation (2005-2009)

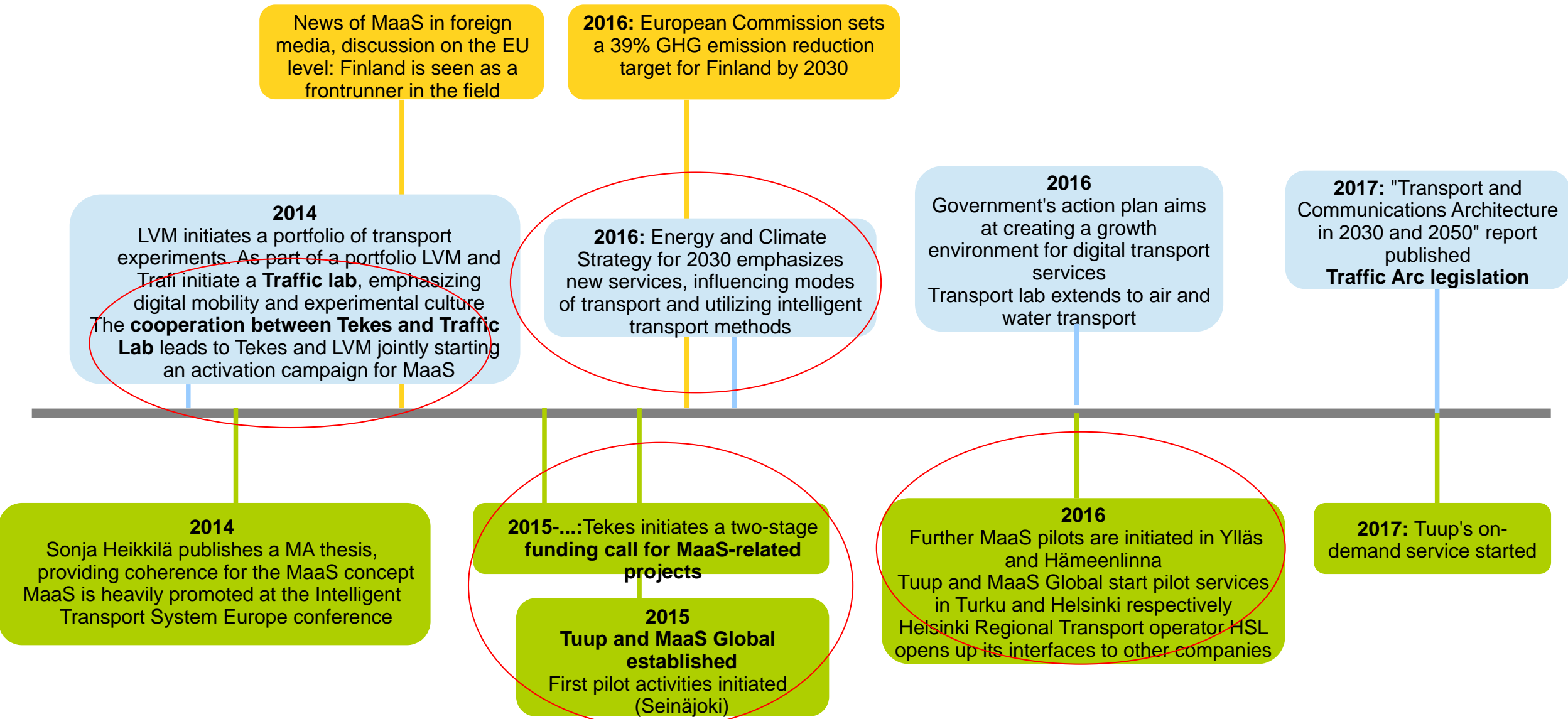
formation (2005-2009)

2. The emergence of MaaS (2010-2013)



A brief history of MaaS II

3. MaaS: from idea to practice (2014-2017)



The future of MaaS

Future

Government's new regulatory framework for transport (Liikennekaari) is anticipated to facilitate the provision of platform-based mobility services
Plans to establish a state-owned enterprise for governing road networks (LIVE)

Future

Autonomous driving and MaaS experimentation planned in the Helsinki-Tampere growth corridor
MaaS Global plans to start a pilot in Birmingham, UK

MaaS expert, Tekes: *“We have been trying to define market disruption through enabling technologies and service provision. The only hindering factor [for MaaS] is the private car capacity today. I think autonomous electric vehicles will be the driver, a tipping point, in this change.”*

Senior researcher, VTT: *“So 20 years ago there was a lot of fuss about fuel cell technology: it will come tomorrow and solve everything. Then came the biofuels. Then we had the hype of electric vehicles around 2010. And I think the next two hypes are MaaS and autonomous vehicles.”*

Key insights from the case

- ▶ MaaS emerged from interacting of top-down and bottom-up initiatives - a system-oriented approach by LVM met with entrepreneurial initiatives and Tekes support
- ▶ Overall evolution of MaaS: multiple rounds of iterations between public and private sector stakeholders – each taking a temporary informal lead in the process and adding new elements to MaaS
- ▶ Coupling of multiple policy initiatives – ‘real world policy mixes’ – by different policy actors has been crucial (1) facilitating market formation for MaaS and (2) removing system barriers
- ▶ Acceleration of mobility transition in Finland might require more attention to (1) coordinating the development of different niches and (2) address the threat that niches may end up reinforcing the existing regime rather than transforming it
- ▶ More attention needs to be turned to distinguishing transformative process (policy) from transformative outcome (impact)

Senior researcher, VTT: *“There has been a lot of unproductive debate between biofuels and electric vehicles supporters. Perhaps there can also be a fight between improved technologies and improved services. But we need everything.”*

Early discussion: Links between the MaaS case and transformative innovation policy?

- A 'real world' innovation policy mix coupled with transport administration's institutional change has been initially successful – but will the long-term outcome be transformative and how?
 - Technology – contribution to the interface of developing apps for MaaS; future links to other niches yet to form
 - Public administration/regulation – yes, has already occurred on the national level but how well connected to grand challenges
 - Markets – initial niche market in operation but has not began replacing dominant markets; diffusion to other countries
 - Transport system as a whole – outcomes yet unknown
- MaaS just one niche – broader transport system transition requires the alignment of multiple niches to capture sustainability benefits
 - Coupled with cultural support and institutional change

Early discussion: Links between the MaaS case and transformative innovation policy?

- Atypical and partly informal policy process approach adopted in this case – does this constitute transformative innovation policy?
 - Process has aimed for transformation, but societal grand challenges have not been very visible
- Non-linear development & lack of coordinated policy mix – does this indicate the benefit of a more experimental approach to transformative innovation policy?
 - But coordination maybe required to connect with other niches, broader vision for new path creation and sustainability
- Further work needed on:
 - To what degree the MaaS case has generated deep learning and new expectations
 - Synergies and contradictions between experimentation vs. coordinated policy mixes
 - How have issues of environmental sustainability and ‘just’ or ‘democratic’ transitions been considered

Conclusions and questions for further work?

- Both informal and formal innovation governance were very important for this development
 - What is the best way to go forward to supporting similar developments in other sectors and contexts?
 - How can both incumbent and new stakeholders be actively involved? How can inclusivity be advanced?
- Transformative elements in this process included: institutional change (administrative sector, changes in framework regulation), shifts in the way of thinking and visioning (from infrastructure to service) and reflexive/flexible innovation policy (informal cooperation, low threshold funding).
 - What are the next steps needed for upscaling MaaS? How can grand challenges be better addressed?
- Work in progress and several interesting avenues to pursue
 - Role of experimentation and learning
 - Role of disruption and disruptive innovation
 - Institutional change and policy mixes
 - Connections between creation of specific paths and broader transformative change in and across socio-technical systems