Planning for new mobility concepts under Deep Uncertainty

June 24th 2021 - FFJ-VALEO WORKSHOP

Peraphan Jittrapirom Dr tech.
peraphan.jittrapirom@ru.nl; peraphanj.com
Senior Researcher, Radboud University

Radboud University

New mobility concepts have prospects to resolve urban transport challenges, but…

..there are challenges and unknowns surrounding these innovative concepts.

- Unclear and contested definitions
- Unknown and unproven real-world effects
- Unclear Governance and regulations, and how it will fit with current regime?
- Uncertain operational aspects

DEEP UNCERTAINTY

Two cases:

Implementing MaaS in the Netherlands

- Address the uncertainties in planning using Dynamic Adaptive Policy (DAP) framework

Vincent Marchau, Rob van der Heijden, and Henk Meurs

Radboud University

Carsharing operation in Bangkok

- Identify the differences of the mental models of stakeholders and align them

Saroach Boonsiripant
Montira Phamornmongkhonchai

CHALLENGES IN IMPLEMENTING MOBILITY-AS-A-SERVICE (MAAS)

Mobility-as-a-Service (MaaS):

- personalised transport service that integrates different modes, provided through a single interface
- in an exchange for pay-as-you-go or a monthly subscription
- promise a shift from an ownership-based to a usage-based transport system

How to develop an implementation plan for MaaS, knowing these uncertainties exist?

Uncertainties surrounding MaaS

Governance and organisation of public transport system:

- Roles of actors? Cooperation from PT operators?
- Who should be platform operator? First to the pole?
- Contractual, liability and insurance arrangements?

Operational aspects:

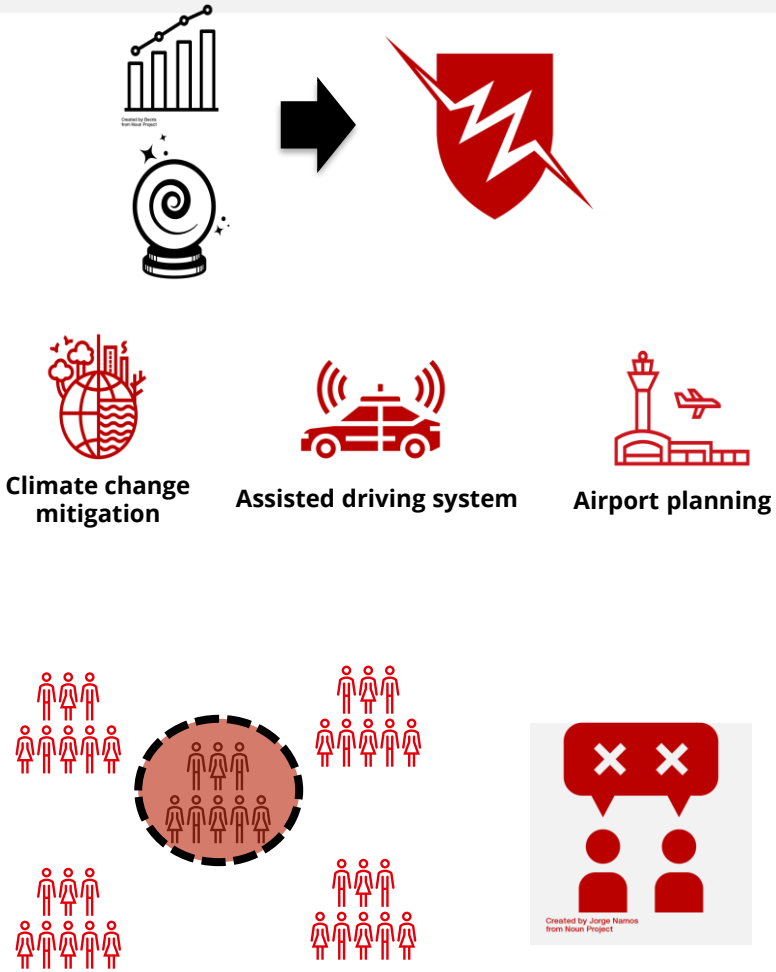
- Fare & revenue distribution?
- Level of service (Planned vs Demand responsive)?
- Data security & asymmetry?

Outcomes:

- Level of sustainability & convenience
- Resource efficiency?
- Equity and Just?

PLANNING FRAMEWORK FOR DEEP UNCERTAINTY

Dynamic Adaptive Policymaking (DAP) – Walker et al. 2013



Dynamic Adaptive policymaking framework

- A move away from predict & act; acknowledge uncertainties
- Ensure selected policies are robust & focus on monitoring process

Benefits:

- Can get started right away with available information
- Future-proof planning process
- Can be used as ex-post planning tool to increase plan's robustness

Challenges:

- Lack of real-life DAP application* and a limited group of experts involved
- Difficulties in using DAP to deal with:
  - **complex** (uncertainty about system structure), and
  - **contested** (uncertainty about preferences) issues*

(*Bosomworth et al., 2017)

We look to enhance this framework in our research

RESEARCH PROCESS

APPLICATION OF DAP TO SUPPORT MAAS IMPLEMENTATION

1.Desktop DAP

- Derive an adaptive plan to implement MaaS from literature review, and discussion among a limited group of experts*
- Provide a starting point of DAP

2.Delphi Survey

- Addressed the limited perspective of DAP
- Gaining a broader perspective by involving global experts*
- Identify planning elements, problematic assumptions, and data to support prioritization of resource

3.Participatory Planning Session

- Contextualize plan through local actors and stakeholders' participations

GENERAL EXPECTATIONS

DELPHI SURVEY: FUTURE OF MOBILITY AS A SERVICE (2018)

- Three rounds (89 / 46 / 35 respondents)
- Mainly from Europe, have diverse backgrounds (Research, Public, Private, etc.)
- High to very High expertise in Transport and MaaS

Results

Early market

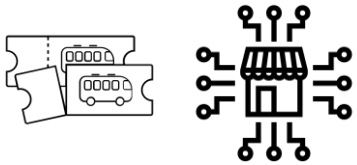
Area of occurrence : expected period

Urban: Expected within 2020

Regional / National: will occur in 2020-2030

Expected early-adopter

- Millennial (21-34) and Gen. Z (under 20) will lead the adoption
- Non-user: 65+, car users, and special needs
- MaaS will attract users from PT & flexible traveller
- Mostly use for commuting and business



Ecosystem

Crucial actors: PT provider, Local authority, and developers

Preferred integrators: PT provider, 3rd party, and Local authority

Least preferred intrators: tele-com providers & investors

Implications

- Optimism in MaaS
- Challenges in MaaS implementation are non-technical

- Dilemma in market share and potential target groups of MaaS
- The cost of providing tailor-made solution for en-mass?
- Demand-responsive focus: Is MaaS a new Taxi?

- Public transport providers holds the rein
- how to ensure values for PT provider in pursuing MaaS
- Trade-off between different integrators

PLANNING ELEMENTS

DELPHI SURVEY: FUTURE OF MOBILITY AS A SERVICE (2018)

Planning

Why implements MaaS (Objectives)?

- Reducing car dependency and usage
- Promote cleaner transport modes
- Provide accessibility to ensure inclusions

What are possible constrains?

- Existing public transport contract & Funding
- Infrastructure
- Limitations in finance and operation regulation

What are available policy to support MaaS?

- Pilot projects
- Clarify roles and responsibilities within the eco-system
- Include MaaS in high-level planning and policy documents

What are necessary condition?

- Close collaboration between key actors and stakeholders
- Availability and standardisation of mobility data
- Successful operationalisation of pilot schemes

Implications

- Is MaaS the right solution for these objectives?
- What supplement policies and measures would be required?

- Changes in contractual, regulatory, and budgeting arrangements are required to implement MaaS.

- Pilot project can help to identify these 'special conditions' but need to be used strategically.
- Complimentary between short-term and long-term efforts.

- Conditions identified reflect assumptions required in implementing MaaS successfully.

VULNERABILITY & OPPORTUNITIES

DELPHI SURVEY: FUTURE OF MOBILITY AS A SERVICE (2018)

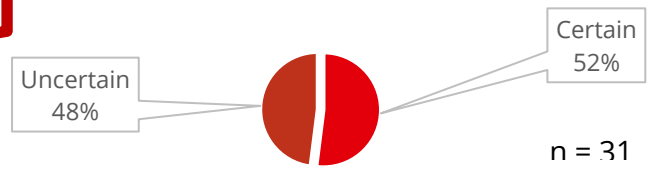
Planning

Potential vulnerabilities

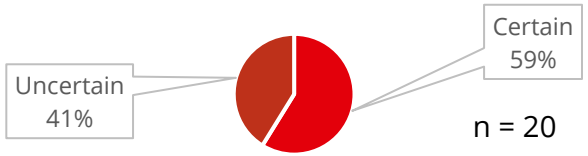
- Crucial actors are unwilling to collaborate
- Lack of an appropriate and attractive business model
- Traveller do not recognise the added value of MaaS

Certainty

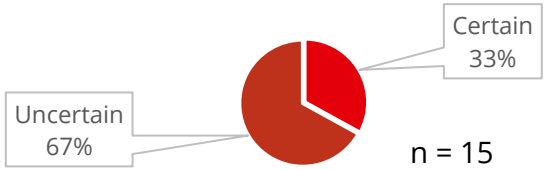
Crucial actors are unwilling to collaborate



Lack of an appropriate business model



Travellers don't recognised added values of MaaS



VULNERABILITY & OPPORTUNITIES

DELPHI SURVEY: FUTURE OF MOBILITY AS A SERVICE (2018)

Planning

Potential vulnerabilities

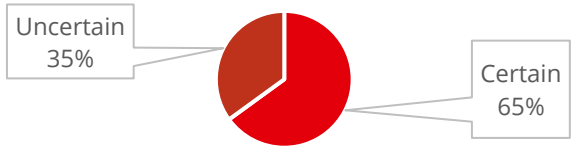
- Crucial actors are unwilling to collaborate
- Lack of an appropriate and attractive business model
- Traveller do not recognise the added value of MaaS

Possible opportunity

- Active collaborations between actors and stakeholders
- Strengthening of political and financial support
- Travellers' satisfaction with the project is above expectation

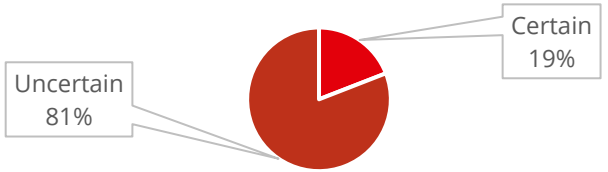
Certainty

Active collaborations between stakeholders



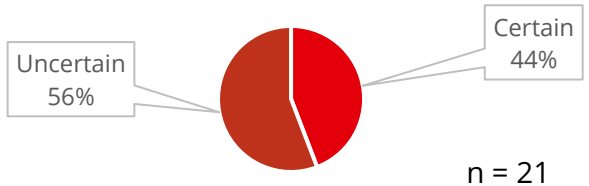
n = 23

A strengthening of political and financial supports



n = 18

Travellers' satisfaction is above expectation



n = 21

DIVERSITY OF GOALS, VISIONS OF SUCCESS, AND LIMITATIONS

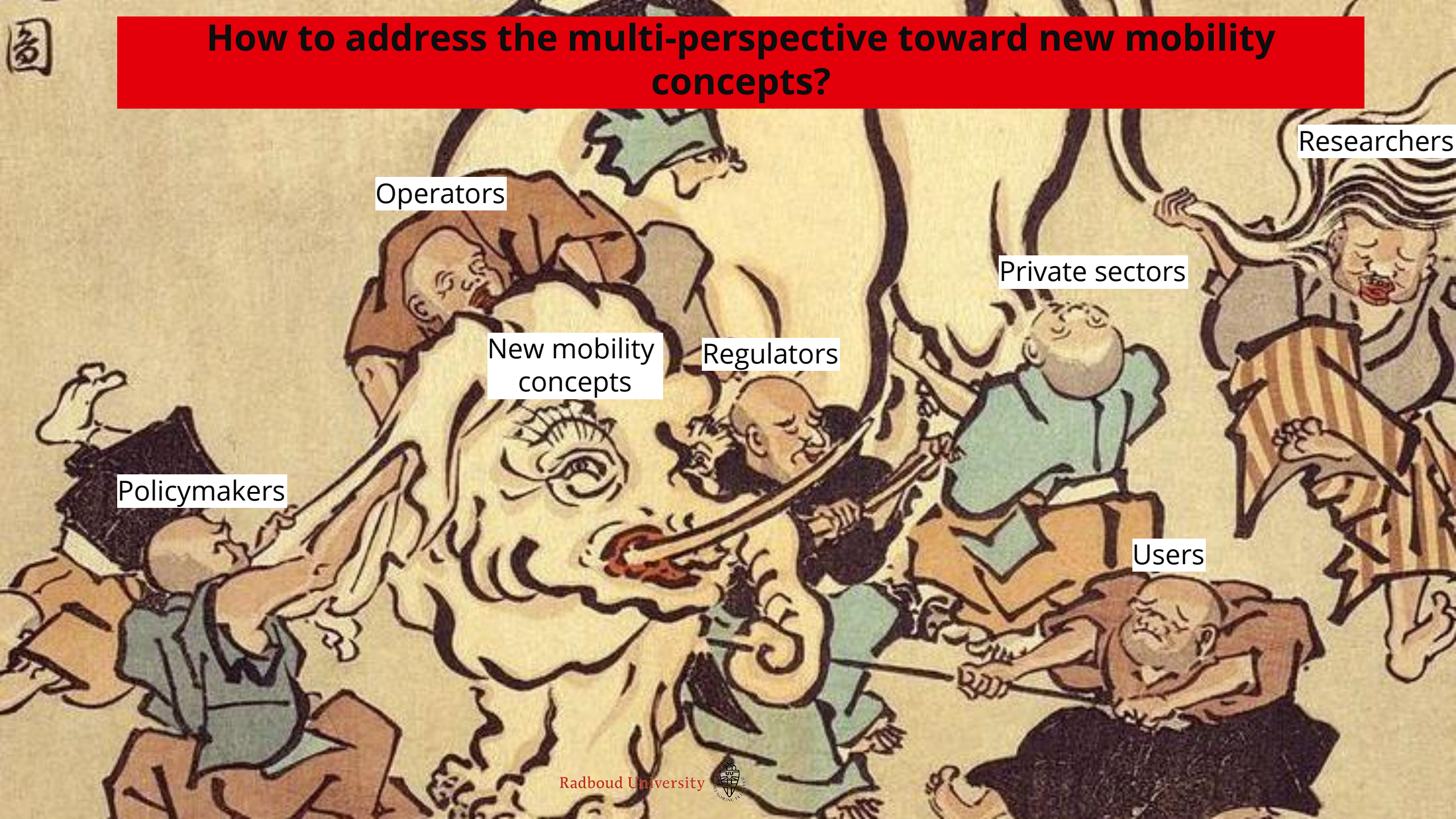
LOCALIZATION OF THE IMPLEMENTATION PLAN (2019)

Nijmegen Region MaaS 2030

	Government	Platform operator	Public transport provider	Travelers
Goals	Accessible; Unlock all modalities	Fit with travellers' needs	Healthy operation	Convenience, Affordable travel
Definition of success	Eliminate monopoly	Successful business case	Greater traveler satisfaction	Ease of travel
Limitations	Unclear role of government	Financial & market risks	Meeting diverse need / scale	Complex service

Source: Jaap Sytsma (MuConsult report)

How to address the multi-perspective toward new mobility concepts?



Group Model Building (GMB)

Invented in 1990s as part of System Dynamics modelling process

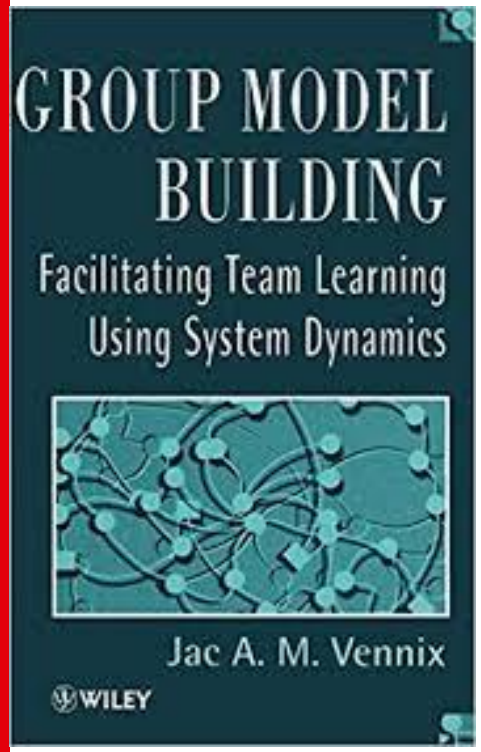
A method to share, process, and structure knowledge and understanding of a complex issue

Why GMB?

- improve understanding of the problem
- transforming insights & broadening perspectives
- enhance consensus, and commitment around the outcomes

Previously applied to complexed and contested problems e.g.

- Climate change
- Resource and environmental management (Limit to Growth)
- Company and organizational management

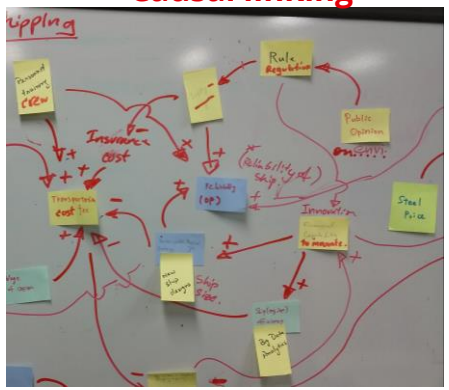


An example of GMB process in Water resource management (Purwanto et al. 2019)

Example of GMB outputs from our previous workshops

Idea elicitation

Causal linking



Causal loop diagram

Research questions

How to reveal and align the mental models of stakeholders concerning car sharing services?

MENTAL MODELS OF STAKEHOLDERS ON CARSHARING

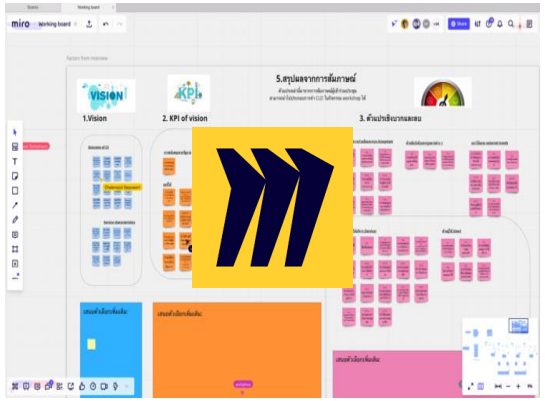
GMB WORKSHOP & OUTCOMES (2020-21)

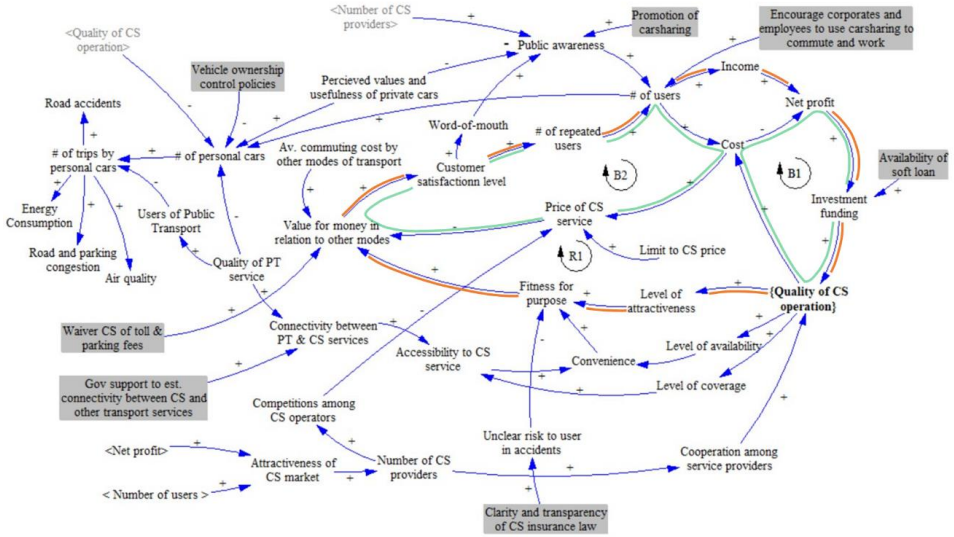
Method

- Remote interviews and workshops with GMB protocol & scripts
- Related participants (20+) from diverse sectors

Some preliminary interesting findings

- Diverse mental models and visions on carsharing services. Strongly link to their professional backgrounds
- GMB process helped to build a shared mental model of Bangkok's carsharing system in form of a system diagram
- Provide outputs to policy formulation & System Dynamics modelling
- Took stakeholders on a learning journey to enhance their insights and build mutual trust





PLANNING FOR NEW MOBILITY CONCEPTS UNDER DEEP UNCERTAINTY

Summary

- Planning process to implement new mobility concepts has to cope with uncertainty surrounding the concepts.
- We demonstrate how Dynamic adaptive planning (DAP) planning framework and Group Model building can support implementations of new mobility services.
- These processes are adoption ready and can complement traditional transport planning process.

Other On-going project:

- Formulating a participatory process to support sustainable transport transition (onthemoveproject.nl)
- Hybrid-process (Quantitative & Qualitative) to simulate possible futures & pathways
- How to envision sustainable transport future with multiple stakeholders? How to formulate adaptive pathway toward the future that are robust against any uncertainties?

peraphan.jittrapirom@ru.nl; peraphanj.com