

Application of remote Group Model Building (rGMB) to support the planning of car sharing system

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OUTLINE

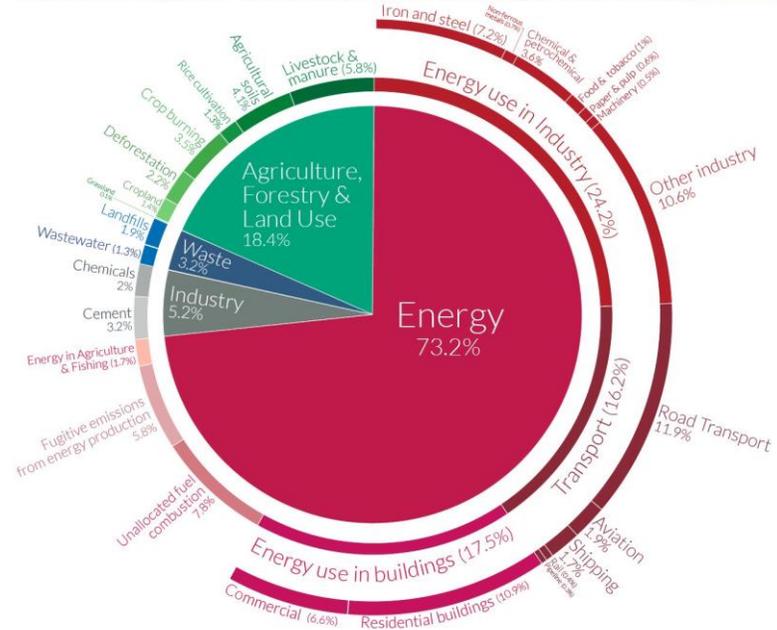
- Motivation and Objectives
- Methodology
- Results
- Discussion and Conclusion

Motivation

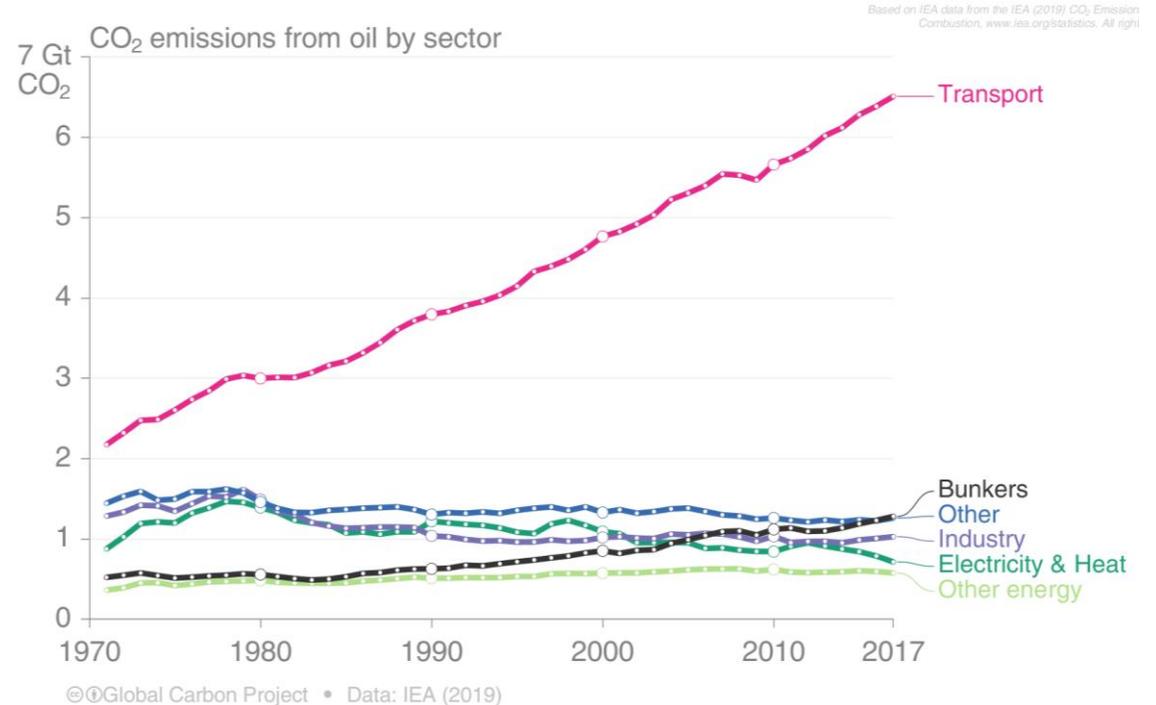
Transport sector consumes high energy and produces GHG emission

- CO₂ emissions in the sector are dominated by national transport with almost linear growth over five decades.
- Road transport contributes ~75% of the transport sector emission.

Global greenhouse gas emissions by sector 
This is shown for the year 2016 – global greenhouse gas emissions were 49.4 billion tonnes CO₂eq.

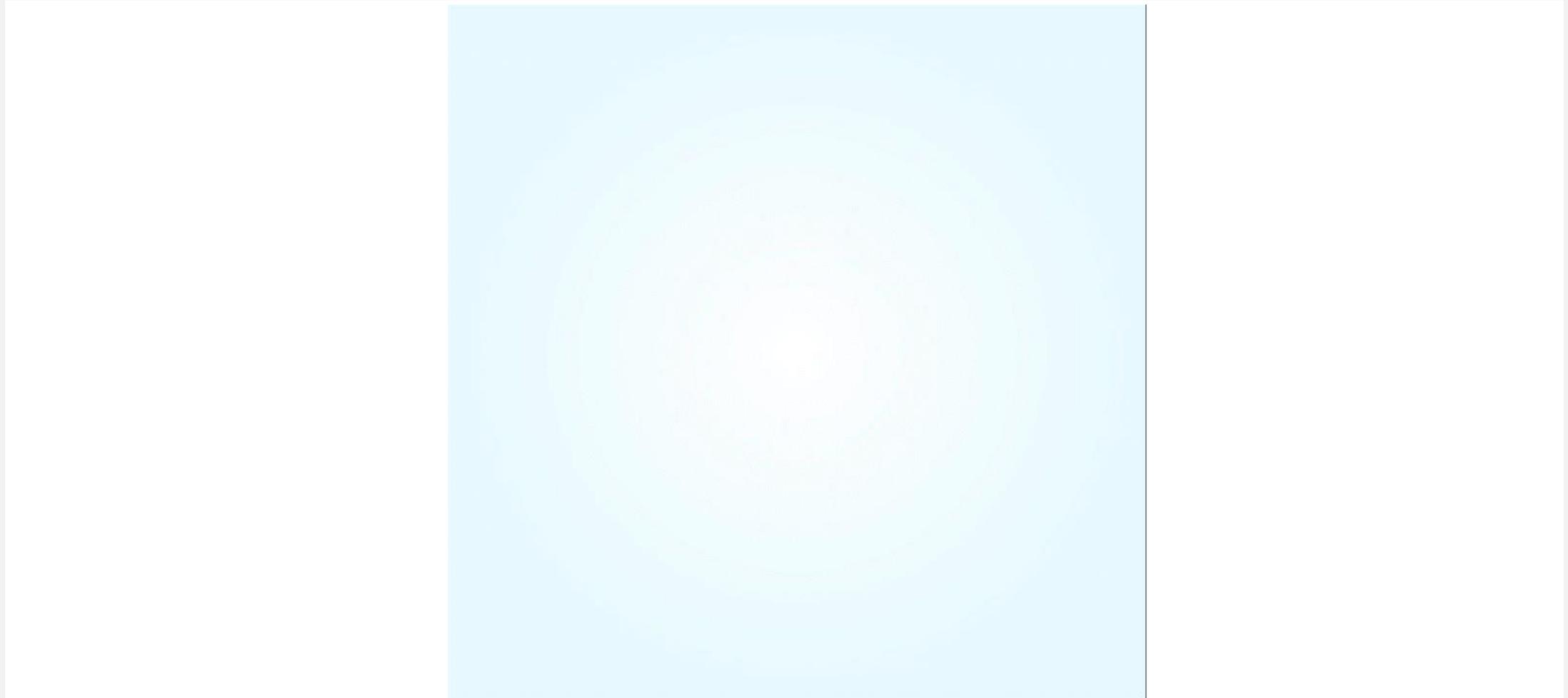


OurWorldinData.org – Research and data to make progress against the world's largest problems.
Source: Climate Watch, the World Resources Institute (2020). Licensed under CC-BY by the author Hannah Ritchie (2020).



Source: IEA 2019; Peters et al 2019; Global Carbon Budget 2019

...And the urgency to address this is high (Animation)



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

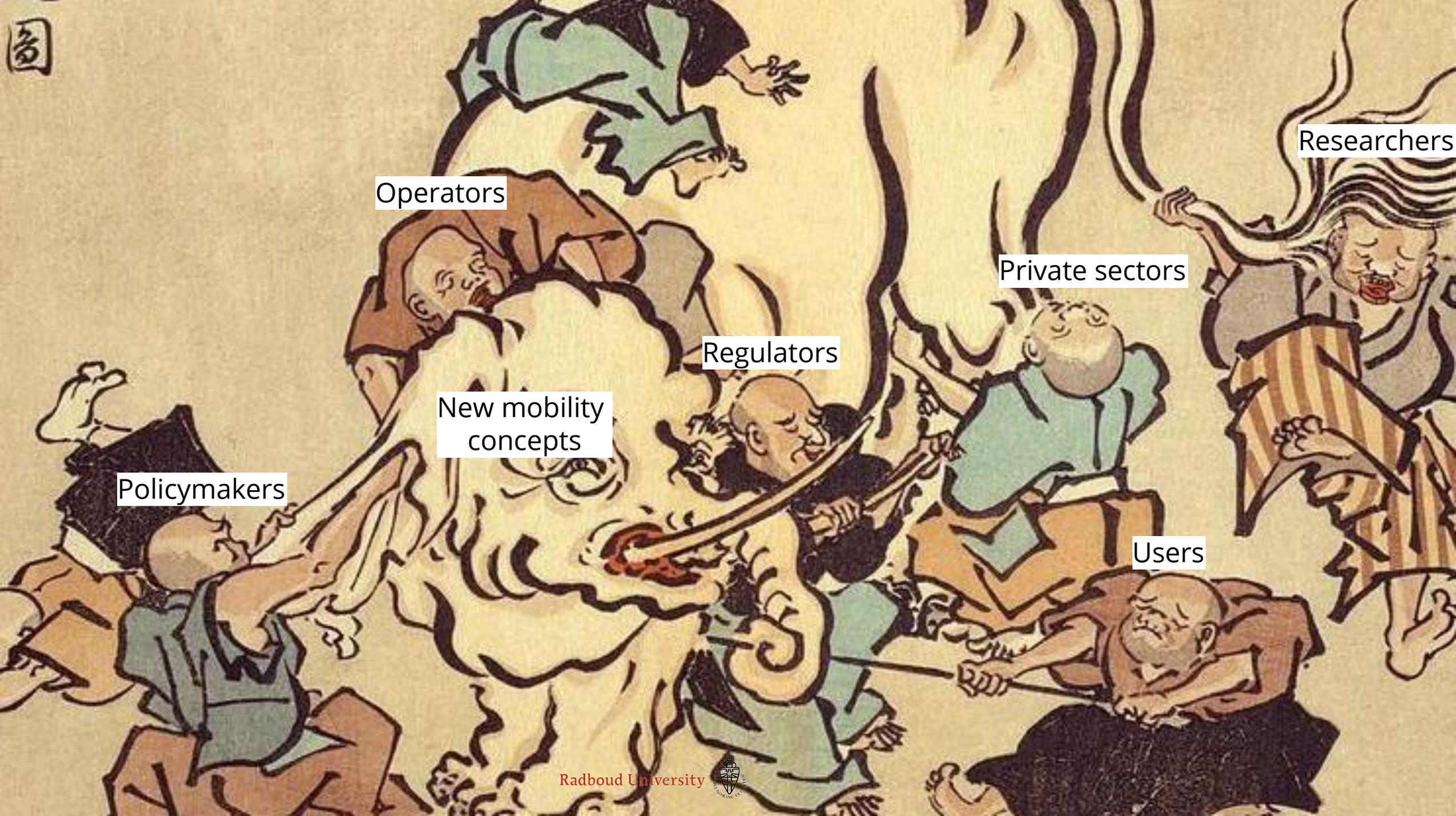
..there are challenges and unknowns surrounding these innovative concepts.



- Unclear or contested definitions and how the service works
- Unknown and unproven real-world effects, particularly in developing countries
- Unclear Governance and regulations, and how it will fit with current regime?
- Uncertain operational aspects

These factors, particularly the lack of shared understanding of the concept among key stakeholders can slow down or hinder their wider implementations.





Researchers

Operators

Private sectors

Regulators

New mobility concepts

Policymakers

Users



A Focus on carsharing services



- **Urban Carsharing (CS) is a sustainable mobility solution**
 - delay vehicle purchase and car ownership; Lower car use and increase PT usage
 - lower energy consumption and GHG emission per HH
- **In Thailand, CS is still in its infancy**
 - First service in 2016; 4,000 veh in service
 - But promising future – recognized as a potential TDM measure for BKK
- **Scientific publication on CS has also been growing, but...**
 - Most focus on users' behavior; adoption; and operation and are based in developed countries; A lack of study that take a system perspective

Research Question and Aims

Research Question:

- How to establish a shared understanding on the dynamics of carsharing system?

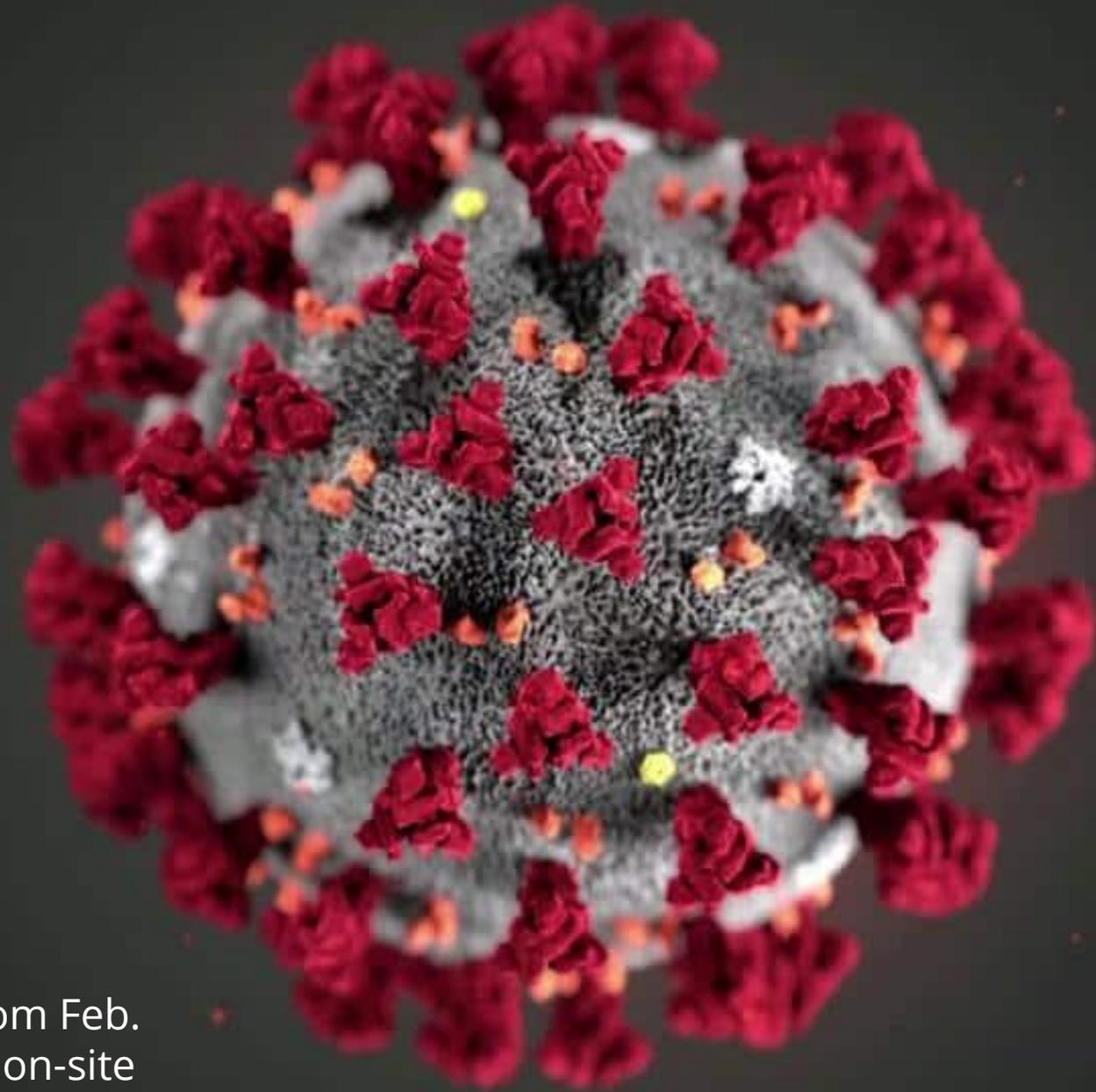
Aim:

- to gain a system perspective of the CS system through the involvement of CS stakeholders
- to identify key policies and measures that would promote and ensure positive societal contributions by CS.

Method: how to obtain system perspective?

- Group Model Building or GMB (Vennix, 1996)





The outbreak of COVID-19 from Feb. 2020 prevents face-to-face & on-site meeting

Process of the Research (April – Dec 2020)

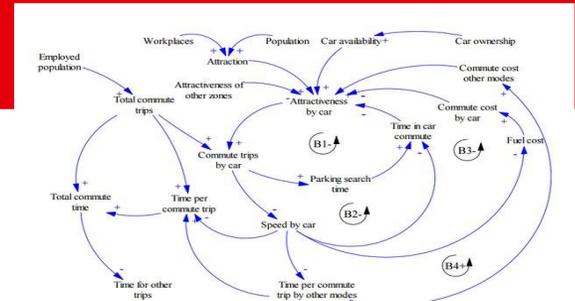
Personal Interviews (mostly remotely)

- Define vision of a successful carsharing system
- Define KPIs, positive and negative attributes
- Propose Policy options
- Confirm transcript



Workshops (all remotely)

- Workshop 1: Construct and combined shared mental map
- Workshop 2: Confirm mental map and identify policy causalities



Post-Workshop (all remotely)

- Workshop reflections/feedbacks via online survey
- A follow-up seminar to disseminate and testing with policymakers



Results: selected Outputs from Interview Transcripts Analysis

Visions

How does a successful carsharing look like?

- Services are convenient and easy to use
- Sufficient stations and coverage area
- High variety of vehicle types and models

KPIs

How do you measure success of carsharing?

- People's awareness of carsharing service
- Number of users, reservations/days, Utilization rate
- Reduction of transport system externalities (pollution, accidents, and energy consumption)

Influencing attributes

Factors that can accelerate or prevent visions to be reached

- Stakeholder collaboration
- People's awareness of carsharing service
- Confidence in carsharing service (reliability)

Policy interventions

What are the causes that driven this change?

- Road pricing, e.g., toll fees
- Tax incentives
- Vehicle ownership control policies

GMB Workshops

Objective:

- Create Causal Loop Diagram for Bangkok's Urban carsharing system; identify policies & measures

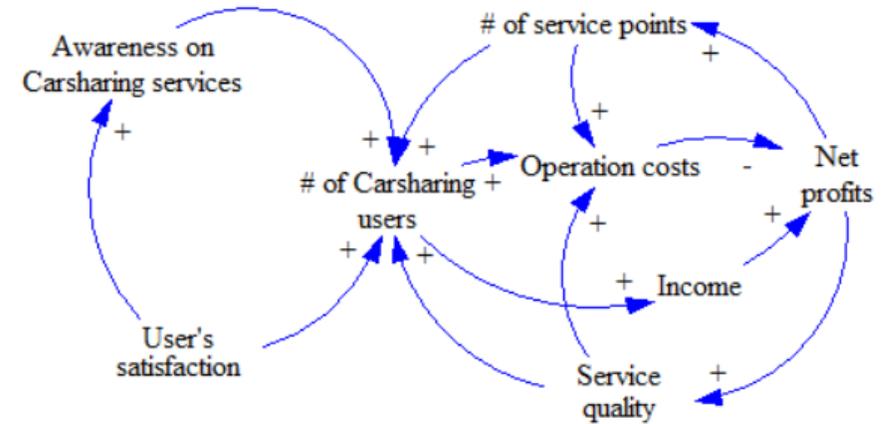
Process: 2 workshops – 2hr each 3 weeks apart

Workshop 1:

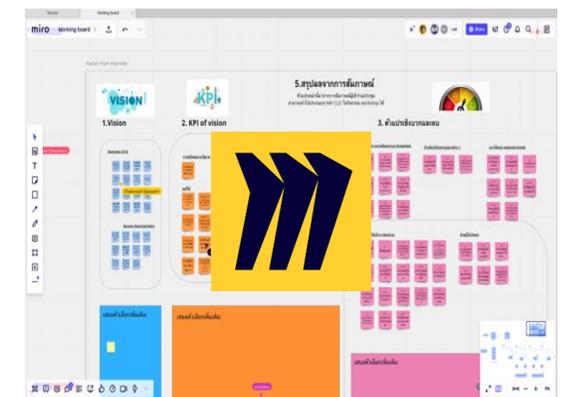
- Briefing, divided into four groups, each with a facilitator
 - Provide an initial CLD
 - Two rounds - (4 CLDs → 2 CLDs)
- Facilitators works on the model off-line ---

Workshop 2:

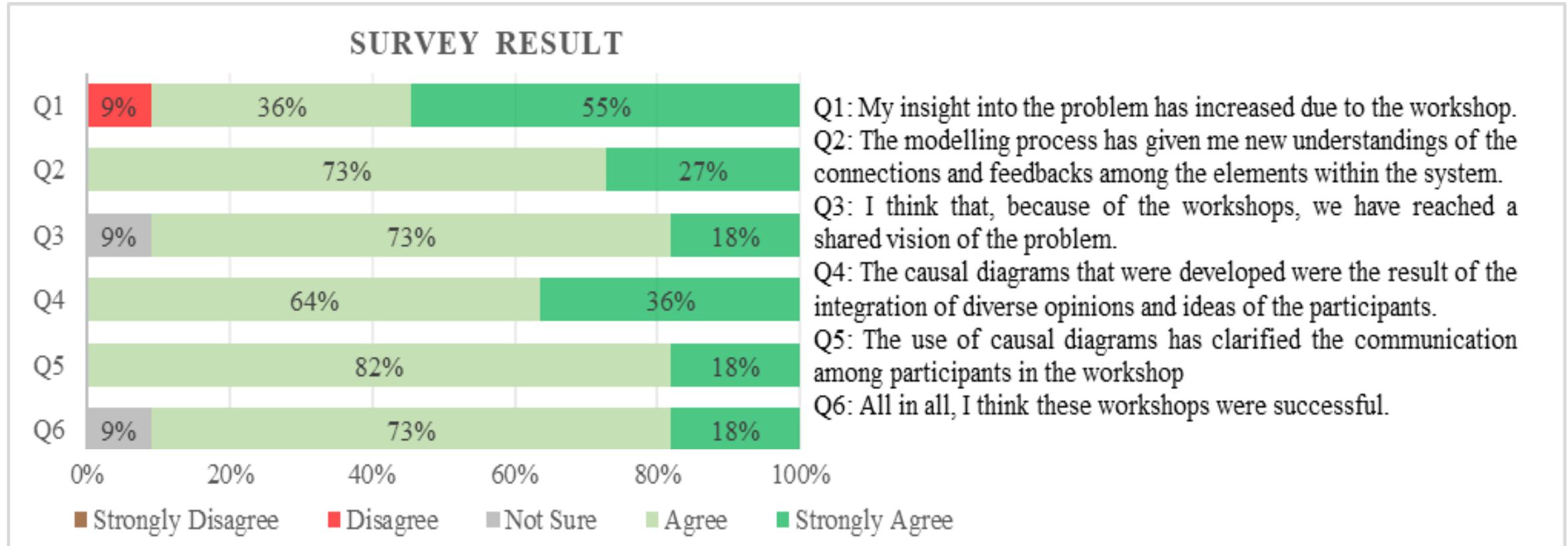
- Assess and evaluate the combined model in Workshop 2
- Discussion on possible policy & intervention



Initial Causal Loop Diagram



Selected outcome from post-workshop survey



Outcomes

Project Results

- Formulated a shared mental model of Bangkok's carsharing system (multi-stakeholder perspectives)
- Results can be used as a basis for qualitative policy analysis model and quantitative models (system dynamics)
- Took stakeholders on a learning journey to understand the concept and related complexity
- Built trust and connections between the stakeholders involved.
- List of planning elements (Vision, Goals, KPI)

Development of New Methodology

- Developed a protocol for remote Group Model Building (minimize cost/time & Covid-19 risk)
- Employ Group Model Building to support planning of an innovative transport concept

Limitation of GMB

- Only capsulated the mental models of those who attended); How to deal with no-show participants
- Required support from participatory (time and efforts); online engagement is challenging
- Several methodology assumptions e.g., no conflict of interest, normalization of power

Next steps

- How Car sharing user behavior changes in the Covid-19 period?
- Use CLD to support possible interventions (e.g. policies and service redesign) to ensure Carsharing services remain a viable service for users.

Other related Project

- On the Move: participatory approach in adaptive transition planning

www.onthemoveproject.nl

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