SCRIPTS: Smart Cities' Responsive Intelligent Public Transport Systems
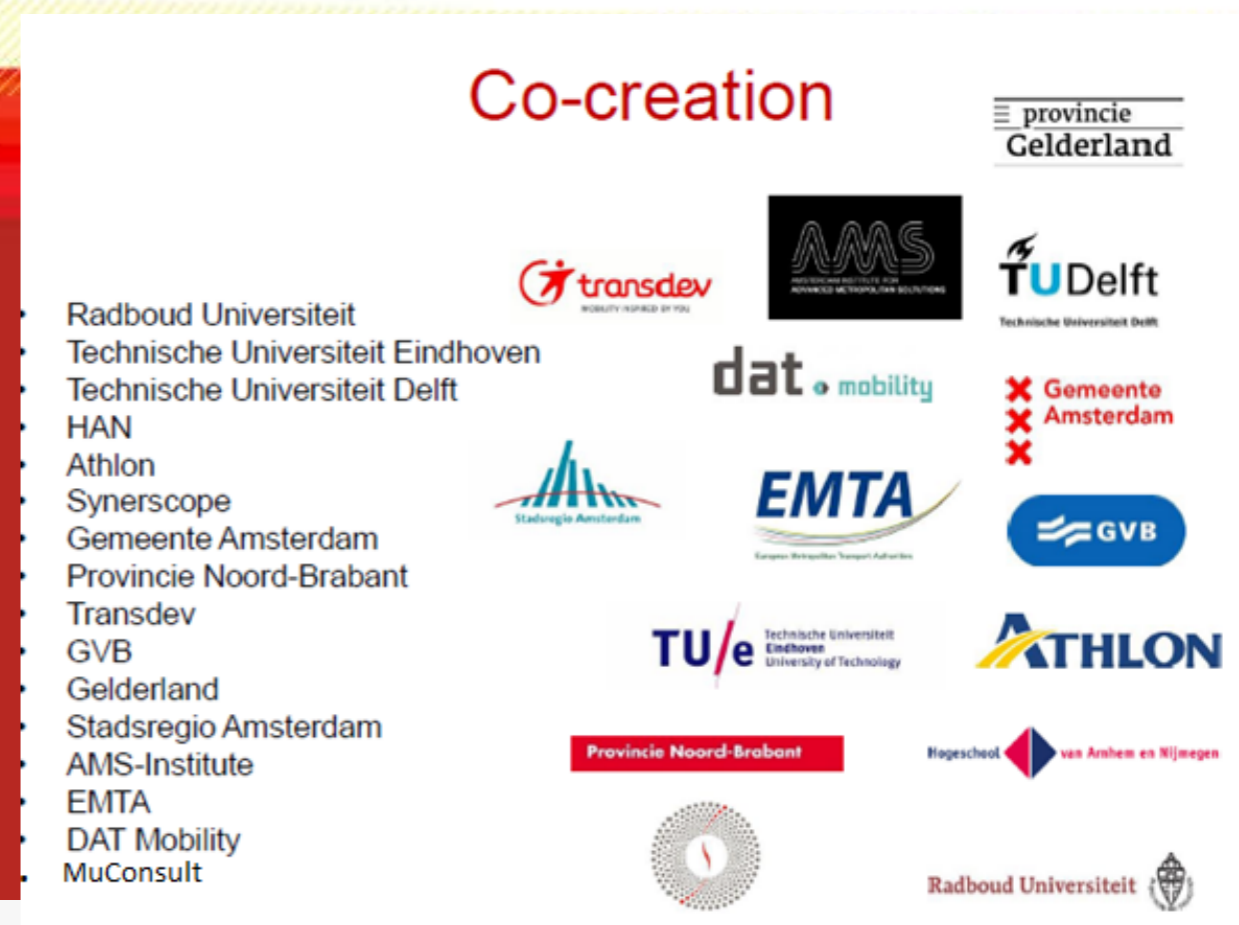
- Prof. Dr. Henk Meurs, Radboud University

Co-creation

- Radboud Universiteit
- Technische Universiteit Eindhoven
- Technische Universiteit Delft
- HAN
- Athlon
- Synerscope
- Gemeente Amsterdam
- Provincie Noord-Brabant
- Transdev
- GVB
- Gelderland
- Stadsregio Amsterdam
- AMS-Institute
- EMTA
- DAT Mobility
- MuConsult

Agenda

1. Introductie SCRIPTS, Prof. dr. Henk Meurs, Radboud Universiteit en MuConsult

2. Marktpotentie MaaS in relatie met samenstelling bundel van mobiliteitsdiensten, Dr. Ir. Valeria Caiati, TU Eindhoven

3. Afstemming wensen gebruikers en aanbod van MaaS-diensten, Dr. Ir. María J. Alonso González, TU Delft en het KIM

4. Planning van MaaS-diensten vanuit onzekerheid, Dr. Peraphan JITTRAPIROM, Radboud Universiteit

5. Agenda voor de toekomst, Dr. Ir. Niels van Oort, TU Delft

6. Discussions with participants, Henk Meurs en Niels van Oort
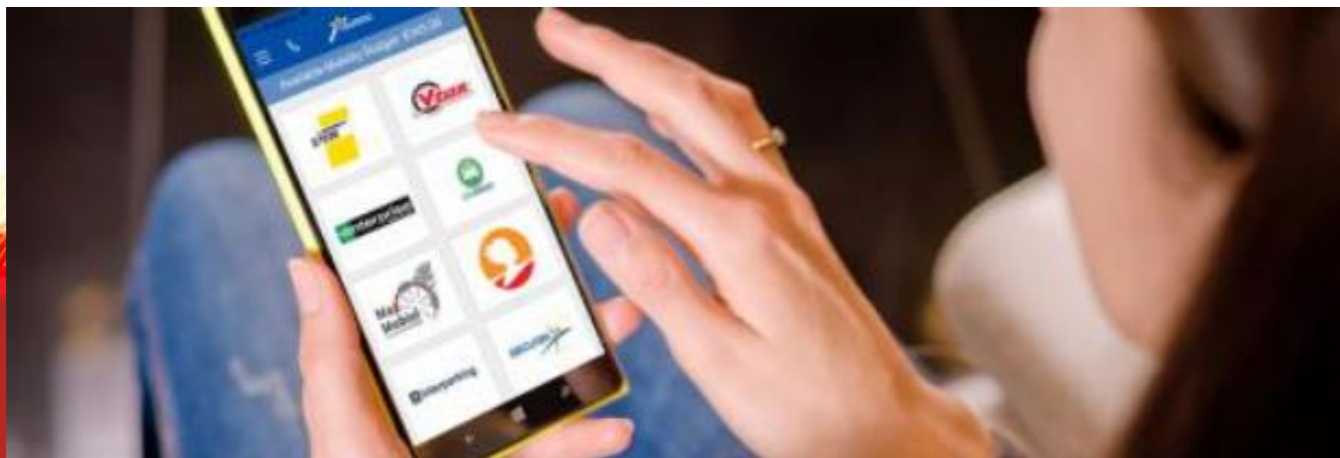
Introduction to SCRIPTS (2015)

Aanleiding SCRIPTS: toekomstige wensen reizigers
- Geintegreerde, flexibele vormen van vervoer (collectief en individueel)
- Gepersonaliseerde aanbiedingen
- One-stop-shop planning, boeken, betalen en reisinformatie
- Naadloos aansluiten op hoogwaardige OV-assen

Veranderingen in aanbod (aanvulling op conventioneel OV)
- Flexibele en/of hybride vormen van mobiliteitsdiensten
- Flexibele inzet materieel en personeel, mn buiten spitsen
- Ontwikkeling platforms voor interactie reizigers en aanbieders diensten \
  - Van enablers naar integrators en brokers

Maar:
- Willen reizigers die flexibiliteit wel icm betere reisplanningssystemen
- Hoe flexibele vormen aansluiting op OV met vaste dienstregelingen
- Zijn er business modellen te ontwikkelen
- Hoe dit goed te organiseren en te regelen
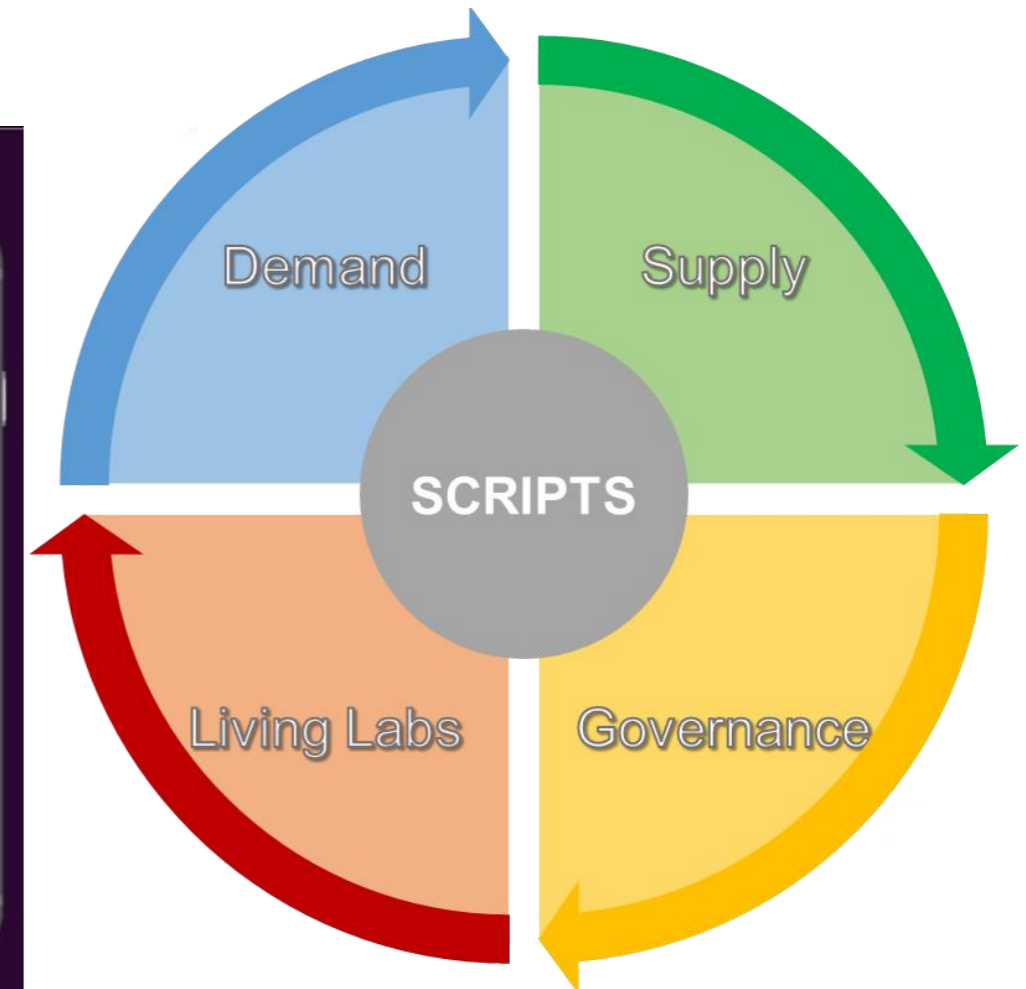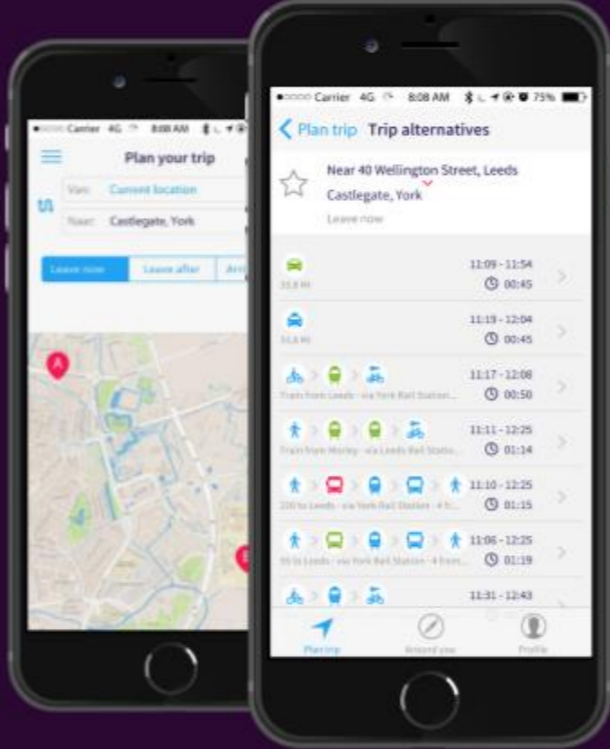- Hoe te plannen in grote onzekerheden
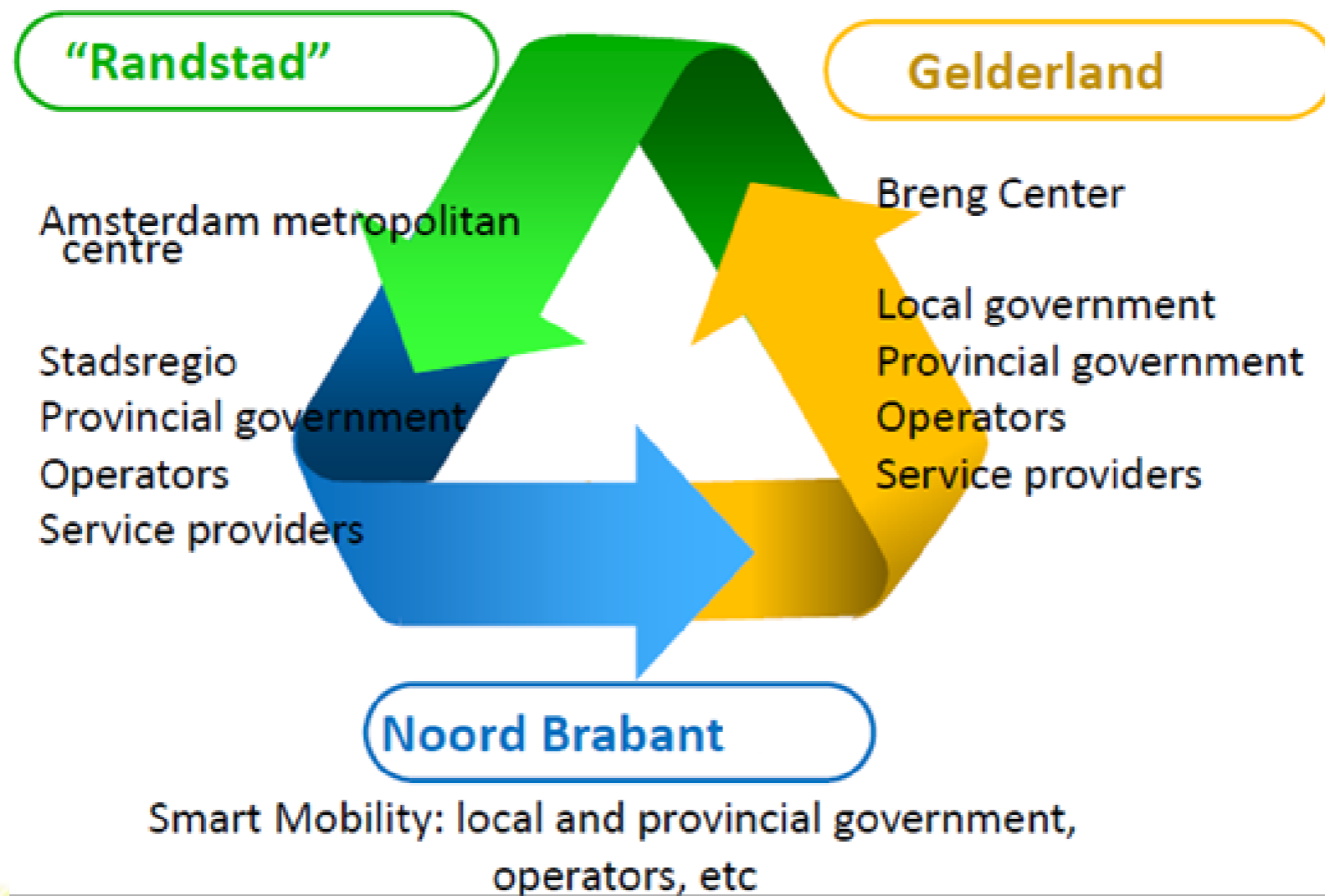
Onderdelen SCRIPTS

Plan your trip

Discover all travel options at a glance
- Current location & personalized search
- Bus, train, taxi, cycling and walking
- Choose from the best overall options
- Clear overview of your selected trip

Demand

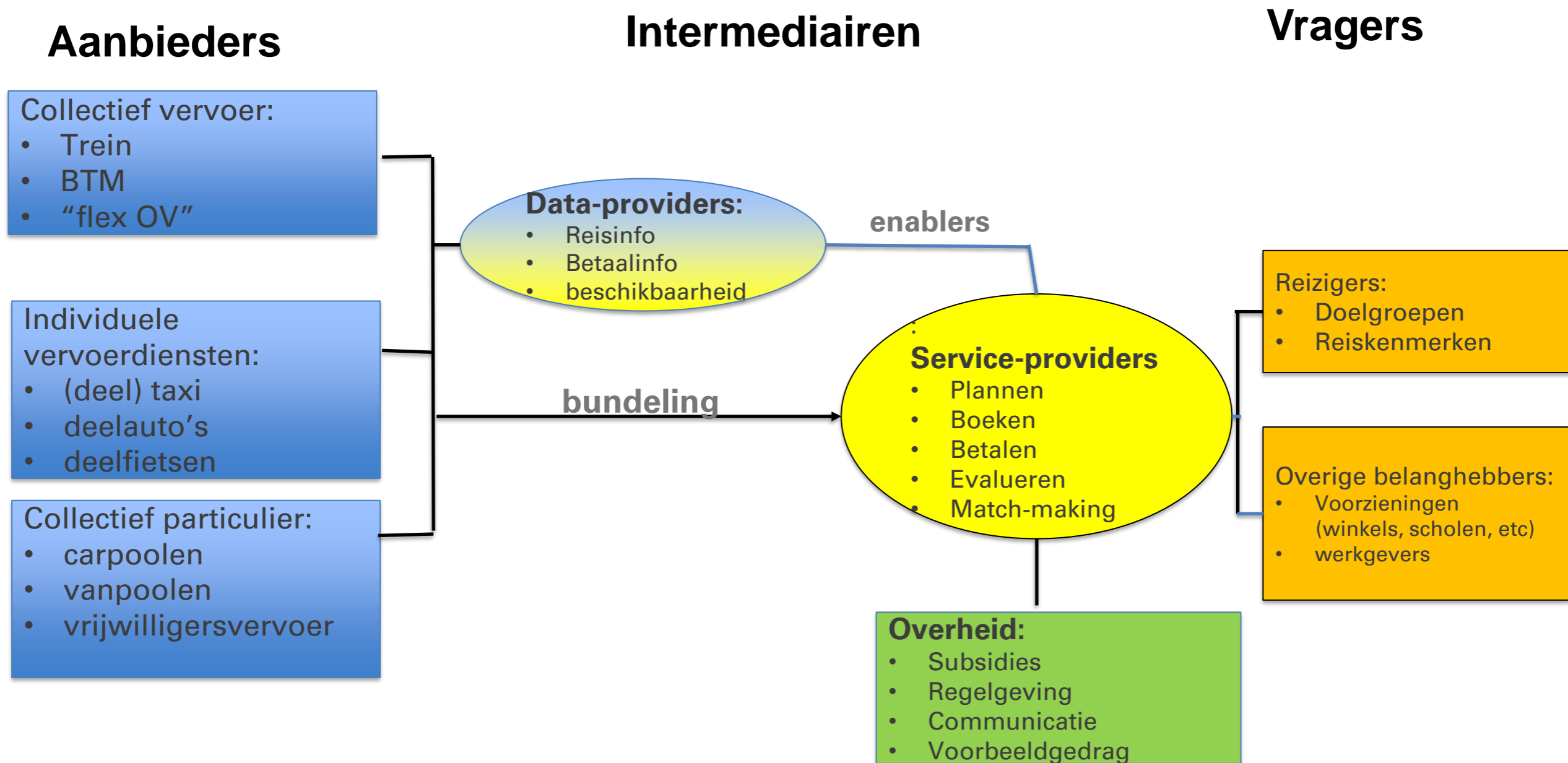Supply

SCRIPTS

Living Labs

Governance

Role of pilots (1) Three pilots SURF

Three regional networks (triple helix) sharing knowledge, best practices and experiences during and beyond project

"Randstad"

Amsterdam metropolitan centre

Stadsregio
Provincial government
Operators
Service providers

Gelderland

Breng Center

Local government
Provincial government
Operators
Service providers

Noord Brabant

Smart Mobility: local and provincial government, operators, etc

MaaS: vele belanghebbenden werken samen

Aanbieders

Intermediairen

Vragers

Collectief vervoer:
- Trein
- BTM
- "flex OV"

Individuele vervoerdiensten:
- (deel) taxi
- deelauto's
- deelfietsen

Collectief particulier:
- carpoolen
- vanpoolen
- vrijwilligersvervoer

Data-providers:
- Reisinfo
- Betaalinfo
- beschikbaarheid

enablers

bundeling

Service-providers
- Plannen
- Boeken
- Betalen
- Evalueren
- Match-making

Overheid:
- Subsidies
- Regelgeving
- Communicatie
- Voorbeeldgedrag

Reizigers:
- Doelgroepen
- Reiskenmerken

Overige belanghebbers:
- Voorzieningen (winkels, scholen, etc)
- werkgevers

Radboud Universiteit

Bereikte resultaten

- Ontwikkelen van state-of-the-art kennis:
  - Dissertaties en talloze artikelen in gerenommeerde tijdschriften
  - Internationale bevestiging/erkenning Nederland als kennisland MaaS

- Leveren aan bijdrage aan de praktijk
  - Inbreng in White Paper I&W$\rightarrow$7 regionale pilots
  - Inzichten in marktpotentie en afstemming vraag-systemen
  - Co-creatie technieken$\rightarrow$samen MaaS ontwikkelen
  - Lessen voor ontwikkeling partnership bedrijven en overheden

- Verdere uitwerking in vervolgprogramma's
  - Zowel in binnenland als Europees

- Kortom: SCRIPTS heeft geleverd…..

- Verdere algemene informatie over SCRIPTS:
  - Prof. dr Henk Meurs, h.meurs@fm.ru.nl

Radboud Universiteit

MaaS market potential in relation to bundle composition of mobility services

MARCH 25TH, 2021

Valeria Caiati, Researcher, Department of the Built Environment, Urban Planning and Transportation Group

TU/e EINDHOVEN UNIVERSITY OF TECHNOLOGY

The SCRIPTS team
Urban Planning and Transportation Group

Explore the demand side of MaaS

Zoom into:
- influential factors on individual decision to adopt MaaS
- effect of MaaS on day-to-day travel behavior with respect to the transport mode choice

Valeria Caiati

Anna-Maria Feneri
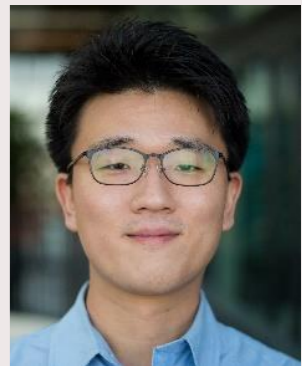
Sunghoon Jang

Soora Rasouli

Harry Timmermans

TU/e

MaaS as...

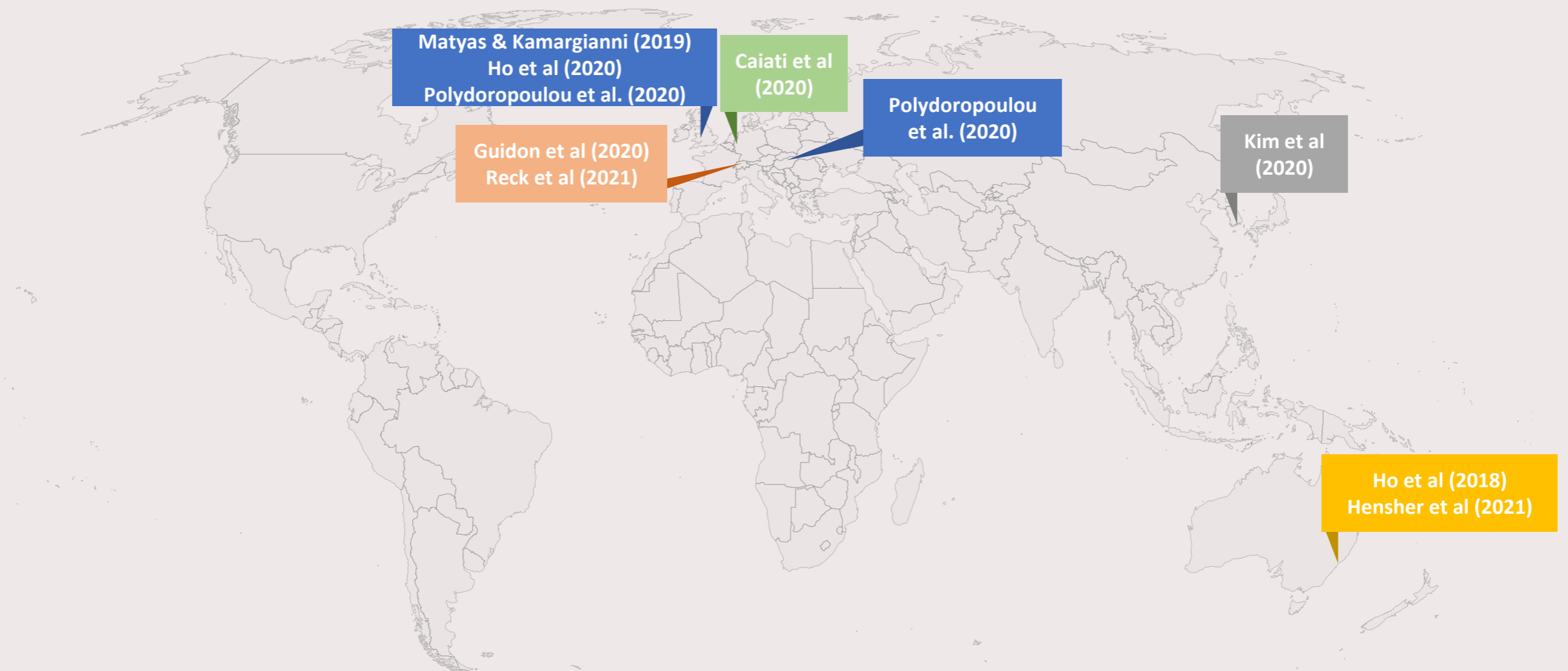|	
4	**Integration of societal goals:** Policies, incentives, etc.
3	**Integration of service offer:** Bundling/subscription, contracts, etc.
2	**Integration of booking and payment:** Single trip-find, book and pay
1	**Integration of information:** Multimodal travel planner, price info
0	**No integration:** Single, separate services

Sochor, J. et al. (2018)

whim

zenGo

UbiGo

	Package 1	Package 2	Package 3
🚌	✓	✓	✓
🚲	✗	✓	✓
🚗	✗	✗	✓
	Order now	Order now	Order now

Subscription-based service based on **bundling** and nonlinear **pricing schemes**

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Studies on MaaS bundling

Matyas & Kamargianni (2019)
Ho et al (2020)
Polydoropoulou et al. (2020)

Caiati et al (2020)

Polydoropoulou et al. (2020)

Guidon et al (2020)
Reck et al (2021)

Kim et al (2020)

Ho et al (2018)
Hensher et al (2021)

Individuals' preferences for MaaS bundles and their willingness to pay have emerged as key research issues on the demand side

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Bundling

Importance to understand which combinations of transportation modes to offer at which price points and which pricing schemes

Conventional bundle choice

Alternative 1

X €/month

Unlimited rides PT

2 hours shared bike

10% discount taxi

☐

Alternative 2

Y €/month

40% discount PT

60 min shared car

20 km taxi

☒

Alternative 3

Z €/month

Pay as you go PT

120 min shared car

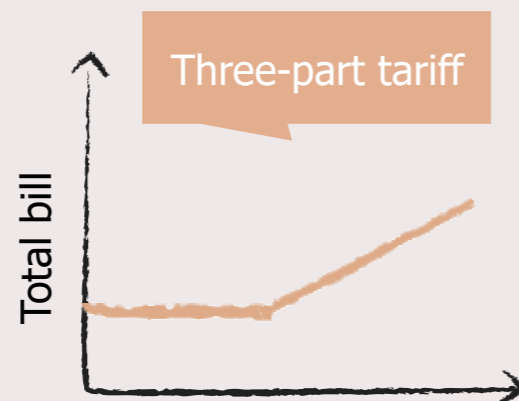50% discount shared bike

☐

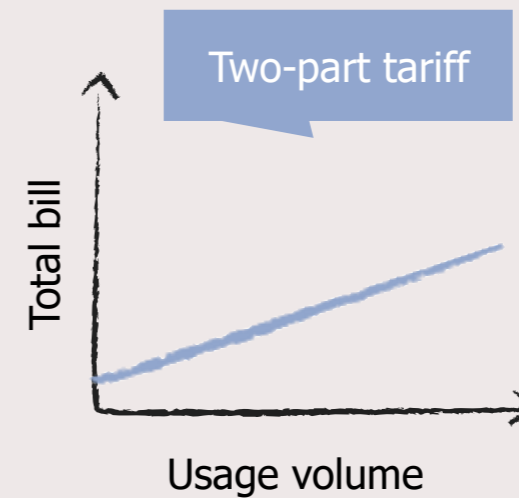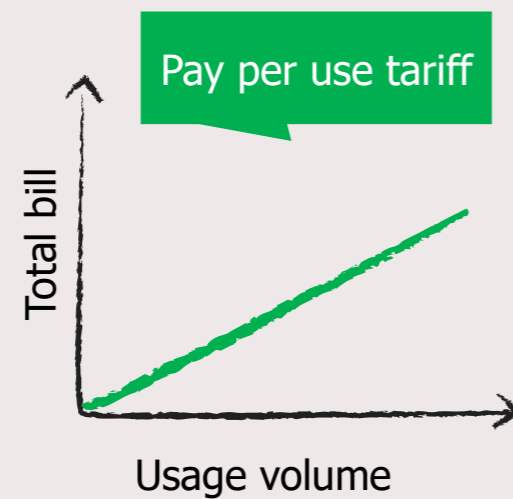## Menu based choice

Build your ideal bundle

X €/month

☒ Unlimited rides PT

☐ 1 free hour/day shared bike

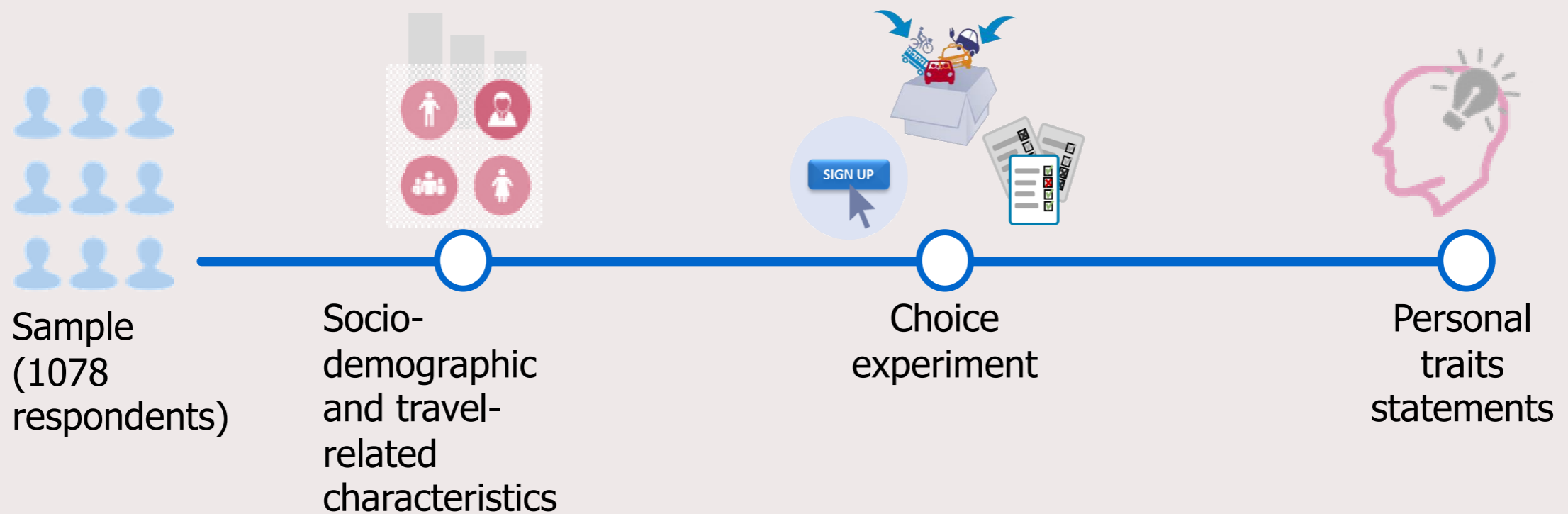☒ 20% discount taxi

☒ 60 min shared car

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Pricing schemes

In considering MaaS as new subscription-based services, pricing of services is crucial for service differentiation
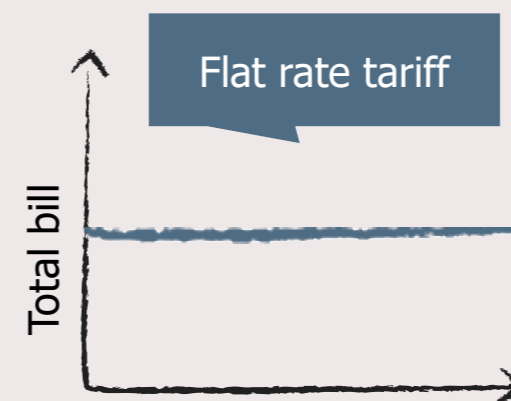
Data used for bundle configuration study

Data collected through a web-based survey conducted in the Amsterdam and Eindhoven (2017)

Sample
(1078
respondents)

Socio-
demographic
and travel-
related
characteristics

SIGN UP

Choice
experiment

Personal
traits
statements

Caiati at al. (2020)

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Subscription and bundle choice

Data collected through a web-based survey conducted in the Amsterdam and Eindhoven

Respondents stated in the 17% of the choice situations that they would be interested to subscribe
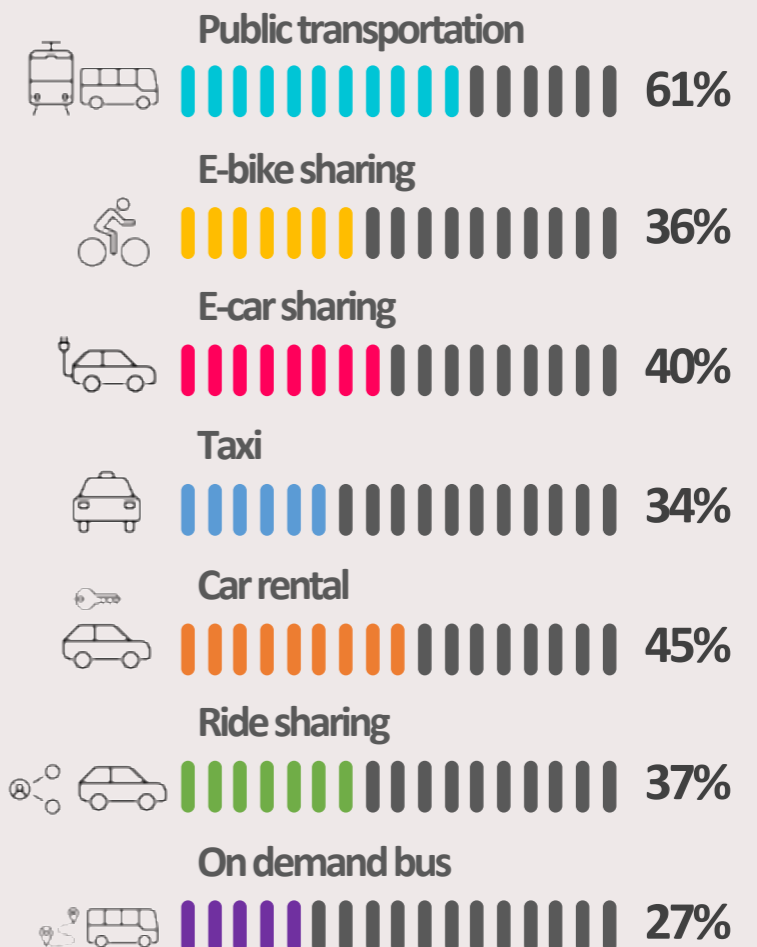
MaaS adopters

55% own a car

87% own a bike
13% own an e-bike

11% own a car sharing membership
50% own a season ticket for public transportation

Findings from:
Caiati, V., Rasouli, S. and Timmermans, H. (2020)
Jang, S., Caiati, V., Rasouli, S. and Timmermans, H. (2020)

Public transportation 61%

E-bike sharing 36%

E-car sharing 40%

Taxi 34%

Car rental 45%

Ride sharing 37%

On demand bus 27%

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End-users preferences for MaaS subscription

Monthly price

People tend to be highly sensitive to the monthly price they are asked to pay for a monthly subscription

Social influence

Social influence also plays an important role in MaaS adoption. People tend to be more willing to subscribe to MaaS when they have positive reviews of the service and when more relatives, friends and colleagues already have a subscription
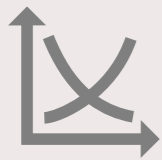
Individual characteristics

Most socio-demographic variables and travel-related characteristics have significant effects on the subscription intention

Findings from:
Caiati at al. (2020)

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End-users preferences for bundles

Pricing

Bundle configuration choice driven by the pricing schemes offered
Preference for flat rate plans or two part plans, as in the case of e-bike sharing and on demand bus

End-Users

Choice about bundle configuration is systematically related to socio-demographics and transport related characteristics of the respondents
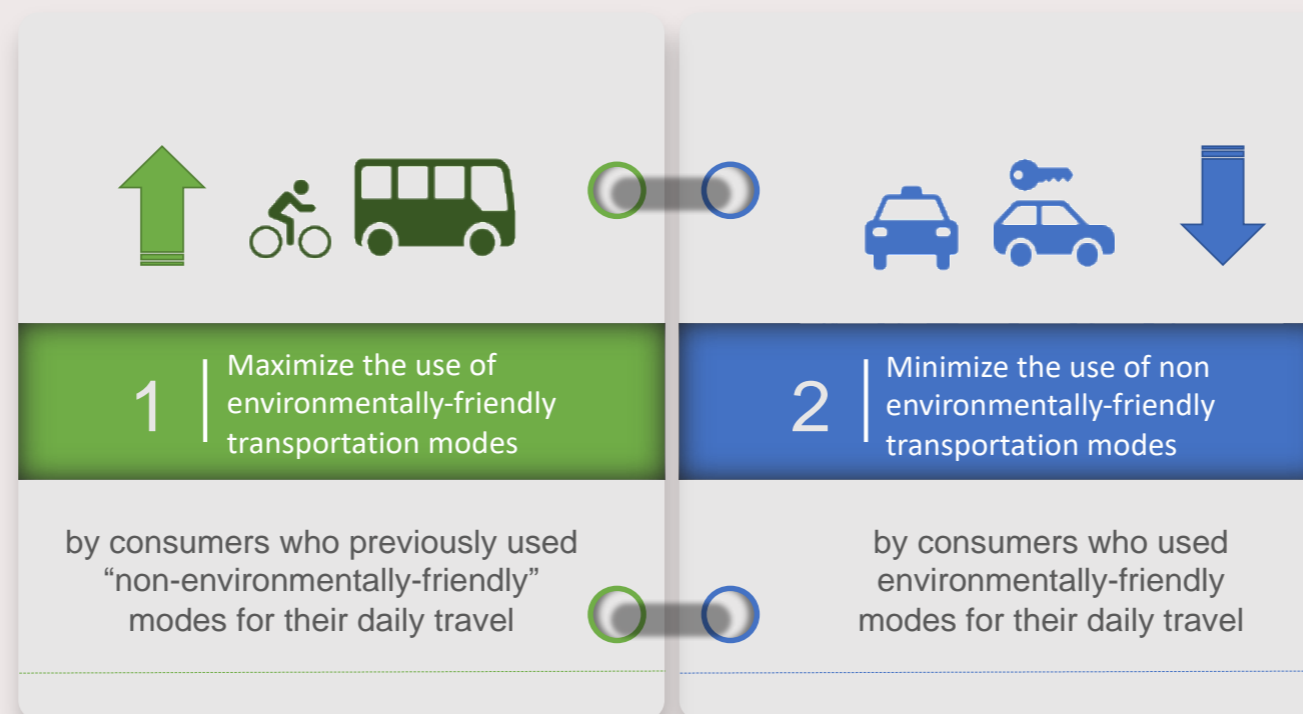
Cross-effect

The cross-effect is highest for the combination e-bike sharing and taxi, indicating that respondents prefer to include both e-bike and taxi in their bundle
The cross-effect is most negative for the combination of car rental and on-demand bus

Findings from:
Caiati at al. (2020), Jang et al. (2020)

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Effect of MaaS bundles

The sustainability effects of MaaS depend on how many people subscribe to MaaS, their current transportation modes and which bundle they choose and use

MaaS should achieve two objectives to improve the sustainability of the transportation system

1 Maximize the use of environmentally-friendly transportation modes	**2** Minimize the use of non environmentally-friendly transportation modes
by consumers who previously used "non-environmentally-friendly" modes for their daily travel	by consumers who used environmentally-friendly modes for their daily travel

Jang et al. (2020)

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Effect of MaaS bundles

Environmentally-friendly consumers

Non environmentally-friendly consumers

35% Of the subscriptions involved non-environmentally friendly modes (taxi, car rental, ride sharing)
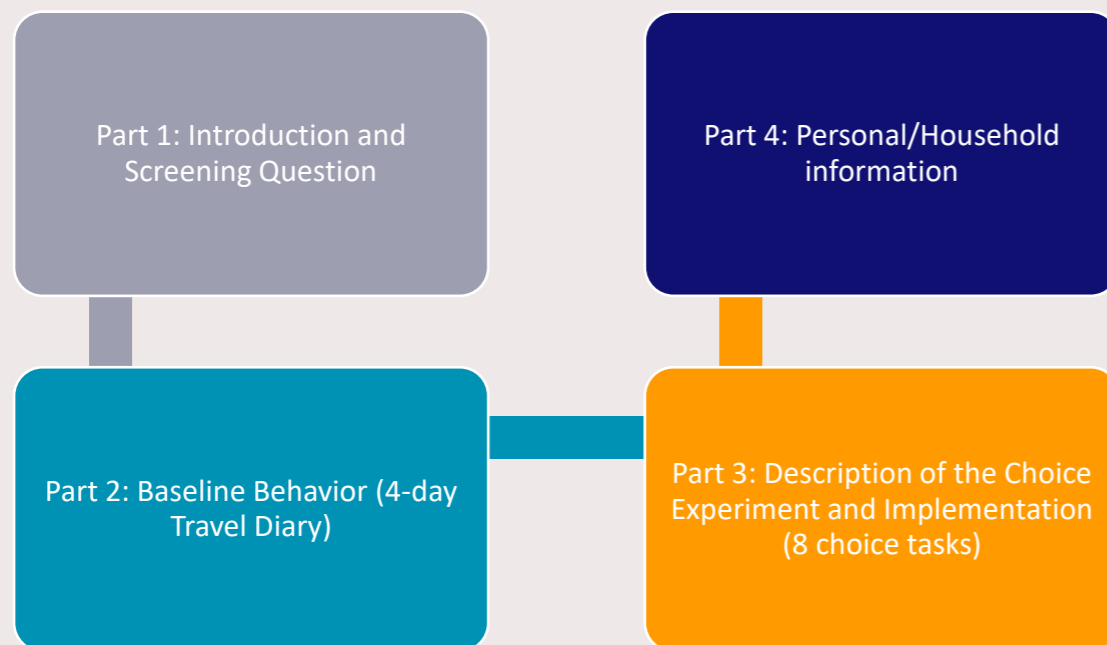
45% Of the subscriptions involved environmentally friendly modes (public transportation, e-bike sharing, e-car sharing, on demand bus)

Jang et al. (2020)

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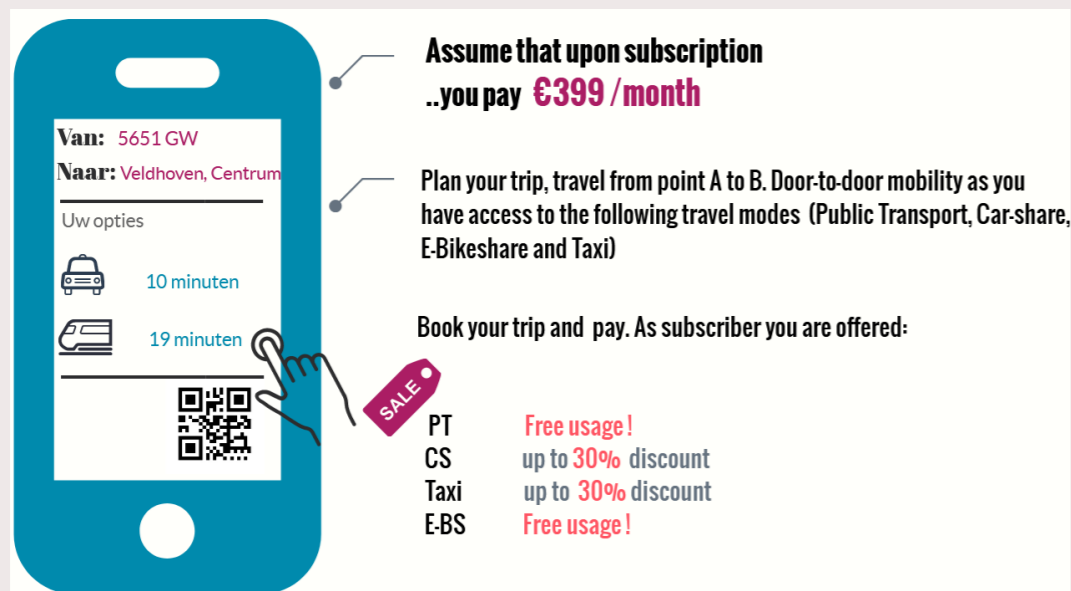# Effect of MaaS on day-to-day travel behaviour

To model the **switch in terms of transportation mode choice** as a result of a hypothetical subscription to MaaS, a survey has been conducted (Rotterdam, Amsterdam and Utrecht), consisting of 4 parts:

Part 1: Introduction and Screening Question

Part 4: Personal/Household information

Part 2: Baseline Behavior (4-day Travel Diary)

Part 3: Description of the Choice Experiment and Implementation (8 choice tasks)

MaaS Mobiliteitsbundels

Bundel A	Bundel B	Bundel C	Bundel D
€0 per maand	**€49 per maand**	**€99 per maand**	**€399 per maand**
Boek uw reis en betalen. Als lid heeft u: **E-Fietsdelen**: Kortingen tot 75% per reis !	**OV**: tot 20% korting **Autodeel**: tot 10% kortingen **Taxi**: tot 10% kortingen **E-Fietsdelen**: Gratis !	**OV**: tot 40% kortingen **Autodeel**: tot 20% kortingen **Taxi**: tot 20% kortingen **E-Fietsdelen**: Gratis !	**OV**: Gratis ! **Autodeel**: tot 30% kortingen **Taxi**: tot 30% kortingen **E-Fietsdelen**: Gratis !

Feneri at al. (2020)

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Stated adaptation choice experiment

Assume that upon subscription

..you pay **€399 /month**

Plan your trip, travel from point A to B. Door-to-door mobility as you have access to the following travel modes (Public Transport, Car-share, E-Bikeshare and Taxi)

Book your trip and pay. As subscriber you are offered:

PT	Free usage !
CS	up to 30% discount
Taxi	up to 30% discount
E-BS	Free usage !

Van: 5651 GW
Naar: Veldhoven, Centrum

Uw opties

- 10 minuten
- 19 minuten

SALE

Your reported trip	
Day	*Tuesday*
Trip Purpose	*Commuting to work*
Travel Mode	*Car-as-Passenger*
Travel Distance	*1-5 km*
Time Pressure	*No time pressure*

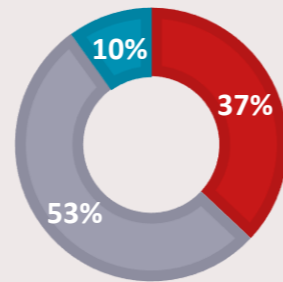|		MaaS OV	MaaS Carshare	MaaS Bikeshare	MaaS Taxi
Travel Cost	*1-5 €*	0 €	0.6 €	Free!	6.6 €
Trip Duration	*Less than 5 min*	2.2 min	3.2 min	5 min	2.5 min
Access Time	*9-12 min*	6-9 min	0-3 min	0-3 min	-
Waiting Time	-	0 min	>5 min	-	-
Egress Time	*6-9 min*	9-12 min	0-3 min	-	-
Parking Cost	*1.10 €/hour*	-	Free	-	-
Parking Time	*5-10 min*	-	5-10 min	-	-
Number of transfers	-	Zero transfers	-	-	-
Make your new choice !		○	○	✓	○

Feneri at al. (2020)
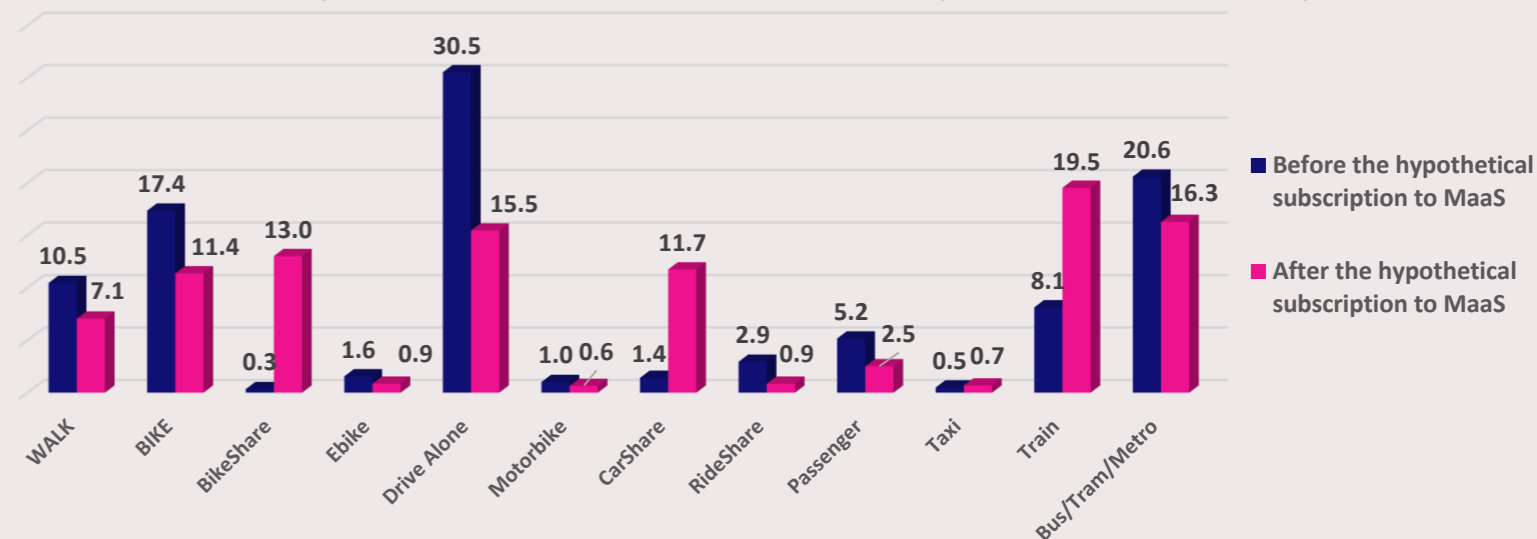
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Data collection and exploration

N=2143:

- 37% of the sample showed no interest

- 53% of the respondents indicated interest in subscribing to MaaS

- 10% showed a strong interest in the service

Findings from:
Feneri at al. (2020)

A total of 1010 respondents were used for analyses and 8080 trips

Bar chart values — Before the hypothetical subscription to MaaS (dark blue) / After the hypothetical subscription to MaaS (pink):

- WALK: 10.5 / 7.1
- BIKE: 17.4 / 11.4
- BikeShare: 0.3 / 13.0
- Ebike: 1.6 / 0.9
- Drive Alone: 30.5 / 15.5
- Motorbike: 1.0 / 0.6
- CarShare: 1.4 / 11.7
- RideShare: 2.9 / 0.9
- Passenger: 5.2 / 2.5
- Taxi: 0.5 / 0.7
- Train: 8.1 / 19.5
- Bus/Tram/Metro: 20.6 / 16.3

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Results on MaaS potential to alter daily travel patterns

Inertia effects

Respondents tend to stick with their current transportation mode. **Younger age groups** are more eager to choose a MaaS mode compared to older age groups. Travelers who currently are **drivers or passengers of privately owned cars** are less willing to continue using their current mode compared with walkers or bikers.

Combination of pricing factors

It is not price per se but the **combination of monthly fees and the discounts** for various transportation modes within a specific bundle to affect the preference towards a specific mode within a bundle

Mode choice

Respondents have a higher tendency to **choose public transportation**, followed by bike sharing, from the inventory of transportation modes in their MaaS bundle. **Bundle C** with 40% discount for public transportation, 20% discount for car sharing and free bike usage positively impacts the tendency of choosing these modes.

Findings from:
Feneri at al. (2020)

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Concluding remarks

01

Public transportation plays a key role in MaaS development

02

MaaS may improve but also deteriorate the sustainability of the transportation system, depending on the kind of transitions between transportation modes that are induced.

03

Findings may support informed decision about pricing and business strategies, service design and user targeting

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Thank you!
Questions?

Valeria Caiati, Urban Planning and Transportation Group, v.caiati@tue.nl

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References

- Caiati, V. , Rasouli, S. , & Timmermans, H. J. P. (2020). Bundling, pricing schemes and extra features preferences for mobility as a service: Sequential portfolio choice experiment. *Transportation Research Part A: Policy and Practice* , *131* , 123–148.
- Feneri, A. M., Rasouli, S. and Timmermans, H. J. P. (2020). Modeling the effect of Mobility-as-a-Service on mode choice decisions. *Transportation Letters*. Taylor & Francis, pp. 1–8
- Guidon, S., Wicki, M., Bernauer, T., & Axhausen, K. W., 2020. Transportation service bundling – for whose benefit? Consumer valuation of pure bundling in the passenger transportation market. *Transportation Research Part A: Policy and Practice* 131, 91-106.
- Hensher, D.A., Ho, C.Q., Reck, D.J. (2021) Mobility as a service and private car use: Evidence from the Sydney MaaS trial. Transportation Research Part A: Policy and Practice, 145, pp. 17-33
- Ho, C. Q. , Hensher, D. A. , Mulley, C. , & Wong, Y. Z. (2018). Potential uptake and willingness-to-pay for mobility as a service (MaaS): A stated choice study. *Transportation Research Part A: Policy and Practice* , *117* , 302–318.
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- Jang, S., V. , Rasouli, S. , Timmermans, H. J. P. & Choi, K. (2020) Does MaaS contribute to sustainable transportation? A mode choice perspective, International Journal of Sustainable Transportation
- Kim, Y. , Kim, E. , Jang, S. , & Kim, D. (2020). Mode choice models of private car user and public transportation user towards mobility-as-a-service: Integrated choice and latent variable approach [Paper presentation]. Paper Presented at the 99th Annual Meeting of the Transportation Research Board, Washington, DC.
- Matyas, M. , & Kamargianni, M. (2019a). The potential of mobility as a service bundles as a mobility management tool. *Transportation* , *46* (5), 1951–1968.
- Polydoropoulou, A. , Tsouros, I. , Pagoni, I. , & Tsirimpa, A. (2020). Exploring individual preferences and willingness to pay for mobility as a service [Paper presentation]. Paper Presented at the 99th Annual Meeting of the Transportation Research Board, Washington, DC.
- Sochor, J. *et al.* (2018). A topological approach to Mobility as a Service: A proposed tool for understanding requirements and effects, and for aiding the integration of societal goals', *Research in Transportation Business and Management*. Elsevier, 27(March), pp. 3–14

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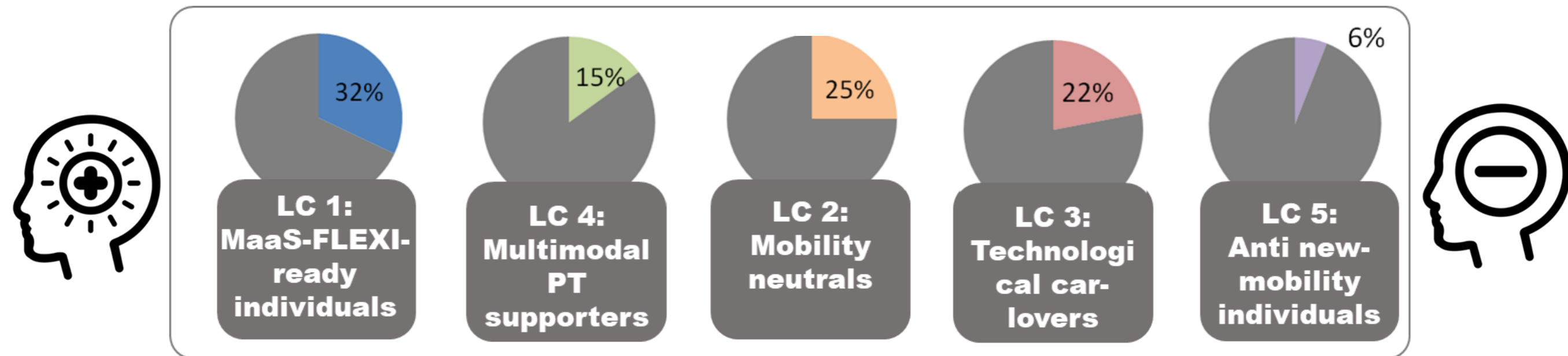# Demand and supply of urban on-demand mobility services

25th March 2021

María J. Alonso González, Jishnu Narayan, Niels van Oort, Oded Cats, Serge Hoogendoorn

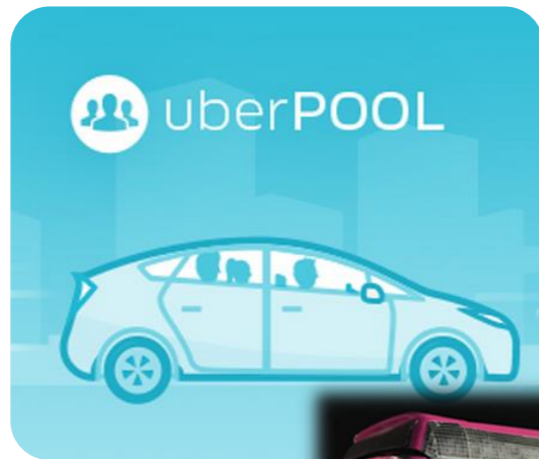# Five distinct clusters regarding attitudes towards MaaS

LC 1: MaaS-FLEXI-ready individuals — 32%

LC 4: Multimodal PT supporters — 15%

LC 2: Mobility neutrals — 25%

LC 3: Technological car-lovers — 22%

LC 5: Anti new-mobility individuals — 6%

Main barriers to MaaS adoption

High (car) ownership need

Low technology adoption

➢ Policies that can help MaaS adoption: (1) Promote MaaS services for occasions for when private car unavailable, and (2) offer hybrid systems that do not require a mobility app (e.g., smartcard).

TUDelft

Pooled on-demand services: an important piece in MaaS and the future of mobility?

Current usage is still limited and does not provide insights into potential demand.

Surveys can help!

Stated preference experiments are a useful tool to investigate individuals' preferred trade-offs

"One size does not fit all" – On-demand services allow for service differentiation and this can lead to an increase in demand.

TUDelft

What are the determinants of the willingness to share a ride? DISCLAIMER: Pre-Covid-19 research!
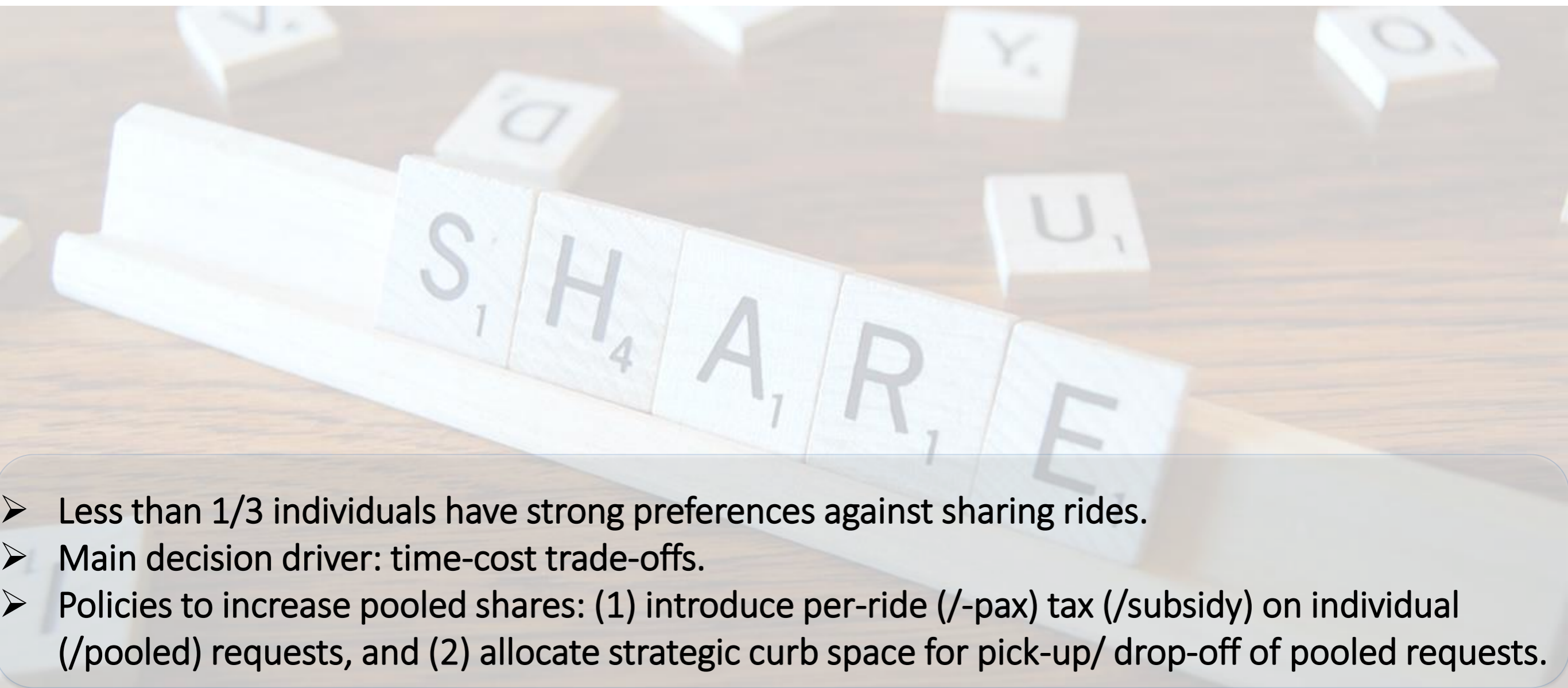
➢ Less than 1/3 individuals have strong preferences against sharing rides.
➢ Main decision driver: time-cost trade-offs.
➢ Policies to increase pooled shares: (1) introduce per-ride (/-pax) tax (/subsidy) on individual (/pooled) requests, and (2) allocate strategic curb space for pick-up/ drop-off of pooled requests.

TUDelft

What about the supply side?
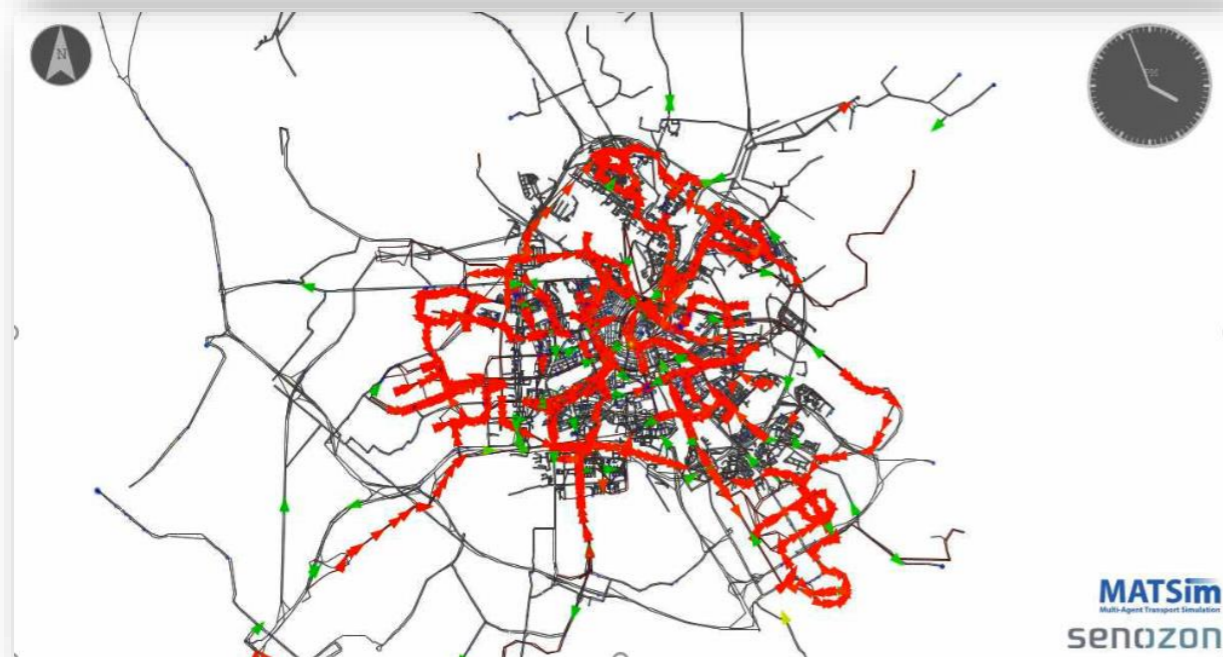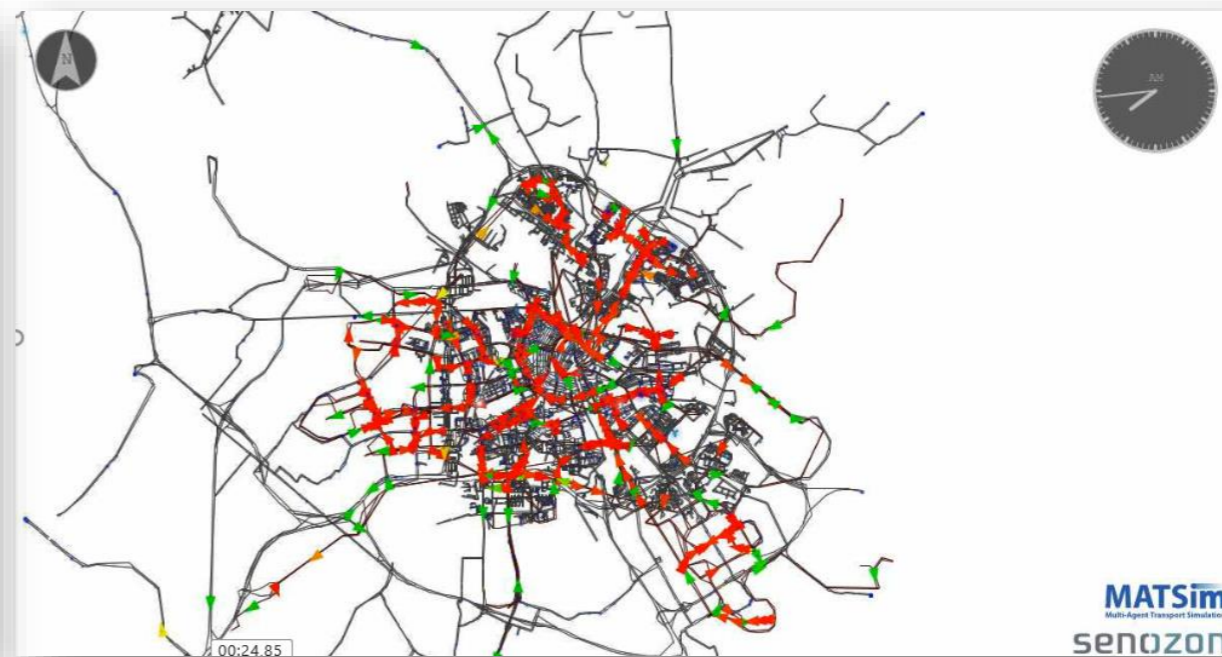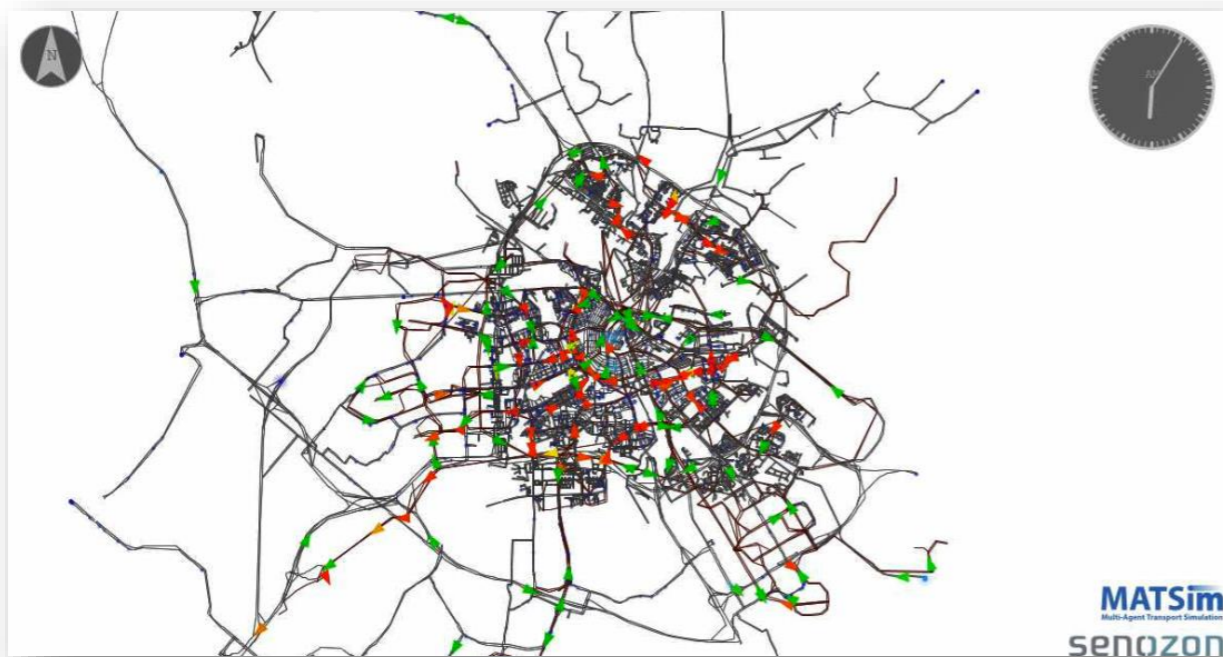
Integrating traditional PT and on-demand services can improve the first-last mile for PT users

A ✕ ✕ **B**

C

TRANSFER

➢ Allowing combination of on-demand and PT results in an overall increase in PT share by about 5%.

➢ Most of the users that combine PT and on-demand use PT in the base case

➢ On-demand service mostly used to cover <30% of the trip length

➢ High volume transfer stops correspond to metro stations and public transport interchange locations within the ring area.

TUDelft

Better results for veh-km and empty drive ratio for the pooled variant

	📶🚗	📶🚐
Veh-km		✔
Empty drive ratio		✔
Travel time	✔	

There is potential for pooled on-demand services to become more commonplace in urban areas in the future

$\tilde{T}$UDelft

Do you want to know more? CONTACT US!!

María J. Alonso González
maria.alonsogonzalez@minienw.nl
in *mariaj-alonsogonzalez*

Jishnu Narayan
j.n.sreekantannair@tudelft.nl

Niels van Oort
n.vanoort@tudelft.nl

Oded Cats
o.cats@tudelft.nl

PhD theses available online:

Demand for Urban Pooled On-Demand Services | TU Delft Repositories

Design and Analysis of On-Demand Mobility Systems | TU Delft Repositories

SCRIPTS

Demand
Supply
Living labs
Governance

TUDelft
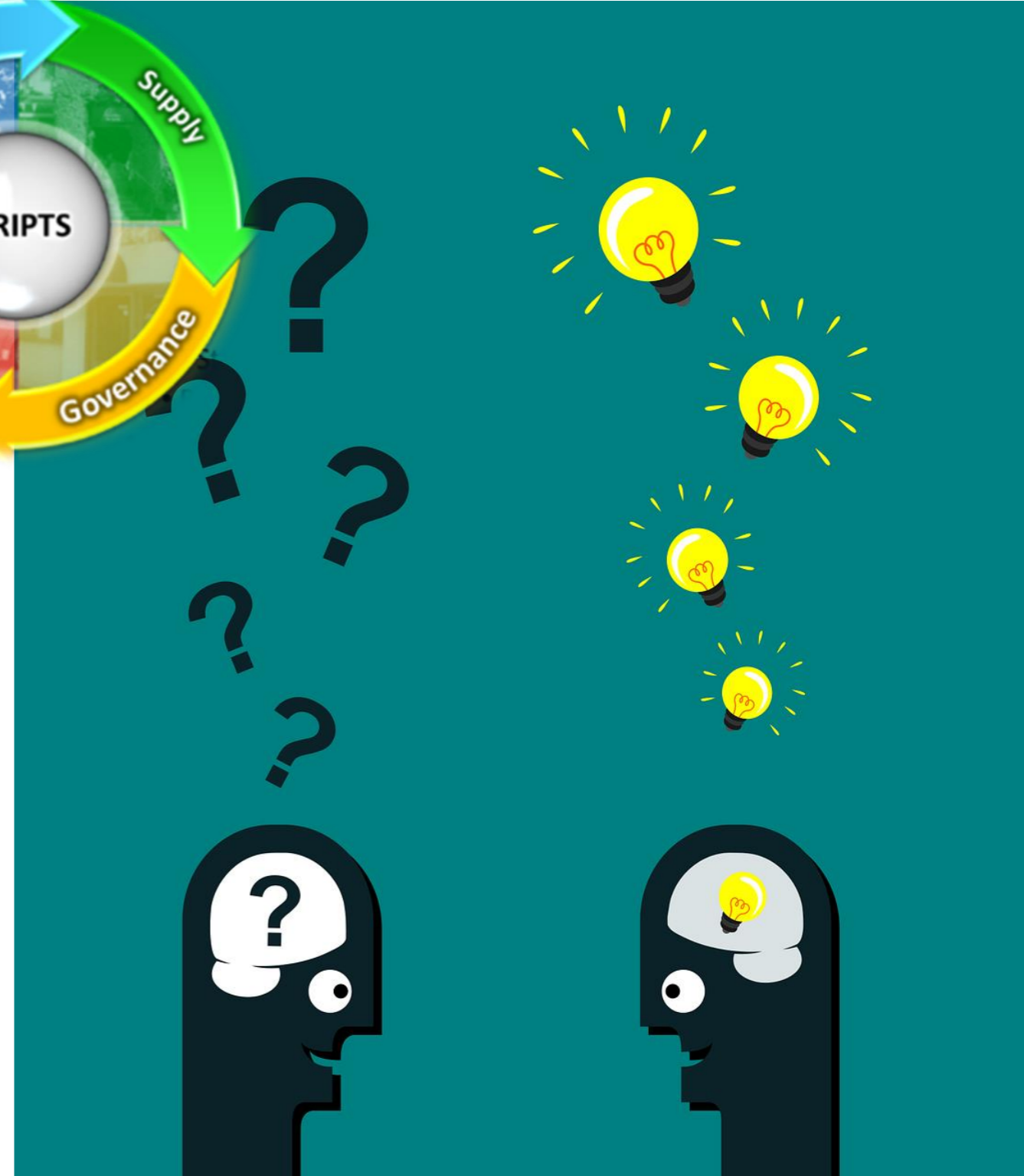
Formulating an adaptive plan to implement MaaS

March 26th 2021 – Verdus conference

P. Jittrapirom*, V Marchau, R van der Heijden, and H. Meurs

p.Jittrapirom@fm.ru.nl
Senior Researcher, Radboud University

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Mobility-as-a-Service MaaS:
- integration of different modes 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

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 arrangements?
- Liability and insurance?

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?

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

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

Climate change mitigation **Assisted driving system** **Airport planning**
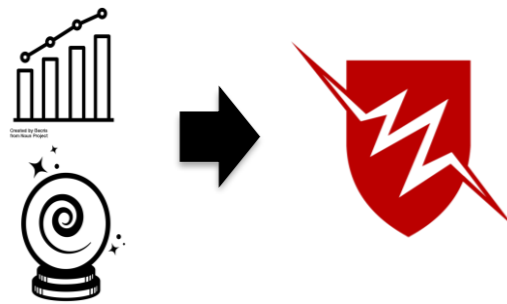
Dynamic Adaptive policymaking framework

- A move away from predictions; acknowledge uncertainties

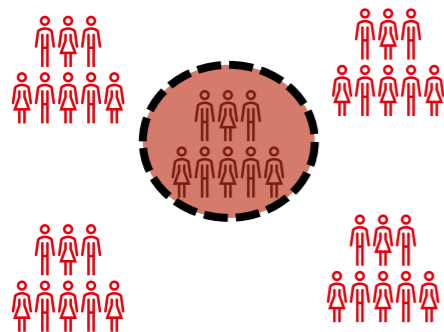- Search for robust policies, focus on monitoring

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*

(*See Bosomworth et al., 2017)

Cr. Till Teenck, Yazmin Alanis, Becris

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# APPLICATION OF DAP TO SUPPORT MAAS IMPLEMENTATION

1.Desktop DAP

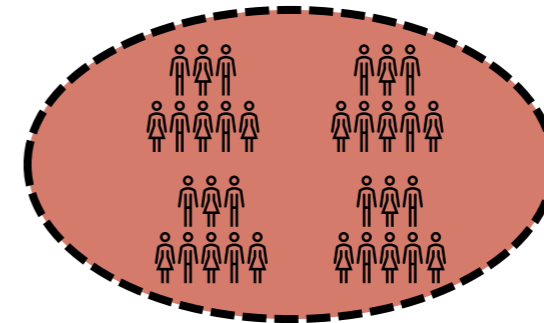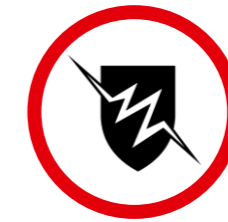Derive an adaptive plan to implement MaaS from desktop study, literature review, and discussion among a limited group of experts*
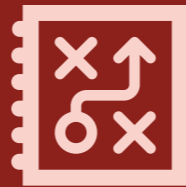
2.Delphi Survey

Gaining a broader perspective by involving global experts*

3.Participatory Planning Session

Contextualize plan through local actors and stakeholders' participations

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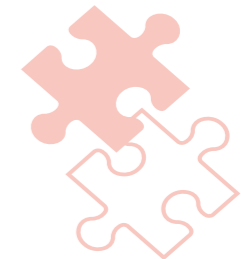
DELPHI SURVEY FUTURE OF MAAS (2018)

~75%

- 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

Created by Ralf Schmitzer
from Noun Project

Results

Early market

2020   2020-2030

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
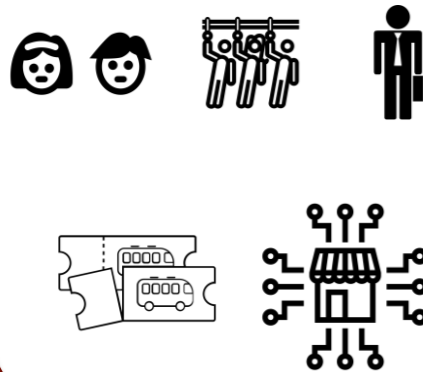
- Challenges in MaaS implementation are non-technical
- Urban MaaS & Rural niches

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

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

SELECTED PLANNING ELEMENTS

Planning

Why implements MaaS (Objectives)?
- Reducing car dependency and usage
- Promote cleaner transport modes
- Provide accessibility to ensure inclusions
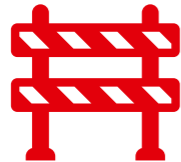
What are possible constrains?
- Existing public transport contract & Funding
- Infrastructure
- Limitations in finance and operation regulation

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 else would be required?

- Changes in contractual, regulatory, and budgeting arrangements required

- 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

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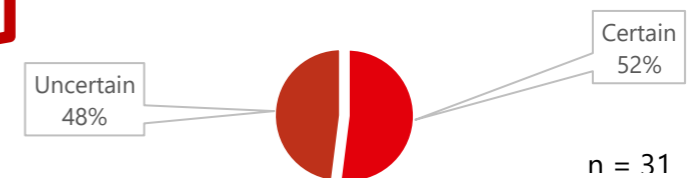
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Planning
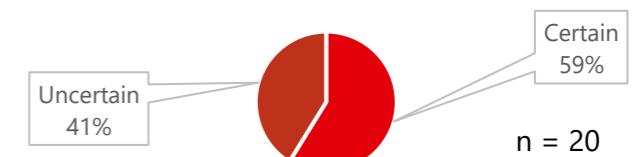
Potential vulnerabilities
- Crucial actors are unwilling to collaborate
- Lack of an appropriate and attractive business model
- Traveller do not recognise the added value of MaaS

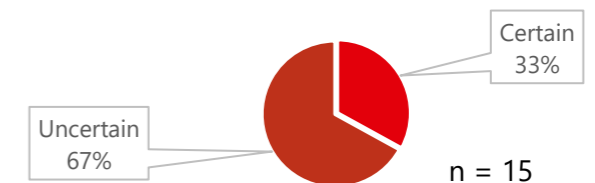**Possible opportunity**
- Active collaborations between actors and stakeholders
- Strengthening of political and financial support
- Travellers' satisfaction with the project is above expectation

Certainty

Active collaborations between stakeholders

Uncertain 35%

Certain 65%

n = 23

A strengthening of political and financial supports

Certain 19%

Uncertain 81%

n = 18

Travellers' satisfaction is above expectation

Certain 44%

Uncertain 56%

n = 21

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SELECTED PLANNING ELEMENTS

Planning

Potential vulnerabilities
- Crucial actors are unwilling to collaborate
- Lack of an appropriate and attractive business model
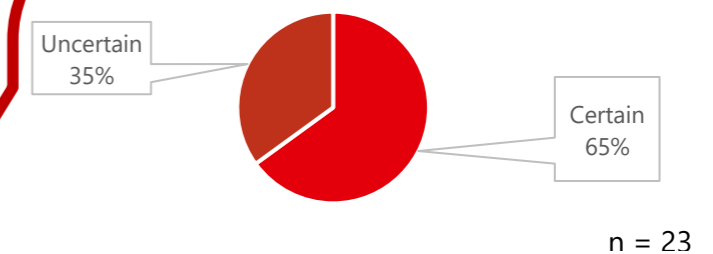- Traveller do not recognise the added value of MaaS
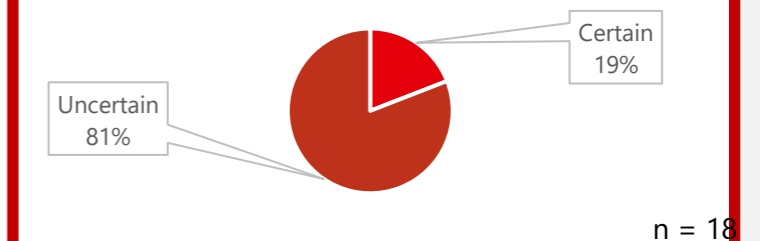
Possible opportunity
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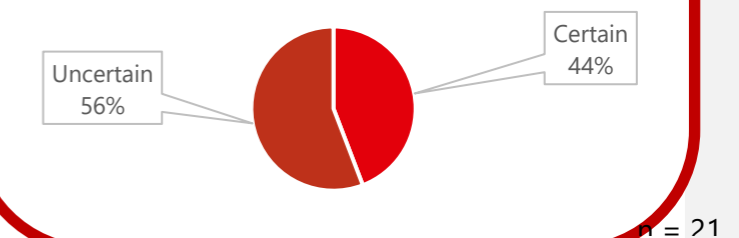- Travellers' satisfaction with the project is above expectation

Interesting remarks
- Marketplace approach vs mobility package approach
- A stronger role for government and public authority is desirable to ensure societal benefits
- Potential social problems & inequality

Challenges in scaling up ?
- Vendor & integrator lock-in
- User acceptance
- Expansion of collaborations & operation

Implications

- Establishing collaboration in MaaS is a challenge
- What can be a suitable business model for MaaS?

- Active use of pilot project

- Wider implications of MaaS

- Plan for up-scaling

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INTERACTIVE WORKSHOP (2019)

NIJMEGEN REGION MAAS 2030 – LOCALIZATION OF THE IMPLEMENTATION PLAN
SELECTED RESULTS

	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)

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SUMMARY

- We implement a Dynamic adaptive planning (DAP) planning framework that address uncertainty surrounding MaaS concept

- We use the Delphi Method and an interactive workshop to widen participations and perspectives included

- The process identify 'jigsaws' to support planning process in implement MaaS
  - Early market of MaaS, its objective, constrains and possible policies
  - Enable quantification level of agreement and uncertainty in expert opinion
  - Enable opinion that may be outlying in normal settings to be heard

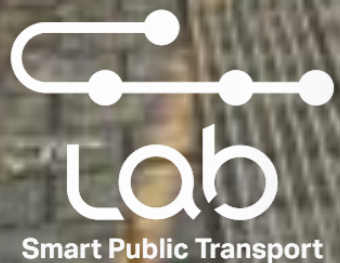- The process is adopted-ready for local authority interested to implement MaaS

Next:

- Formulating a process to support sustainable transport transition (onthemoveproject.nl)

- Inclusions of visioning exercise and participatory planning into the process

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MaaS en flexibilisering mobiliteitsdiensten

Hoe nu verder?

Maart 2021

Niels van Oort

smartPTlab.tudelft.nl
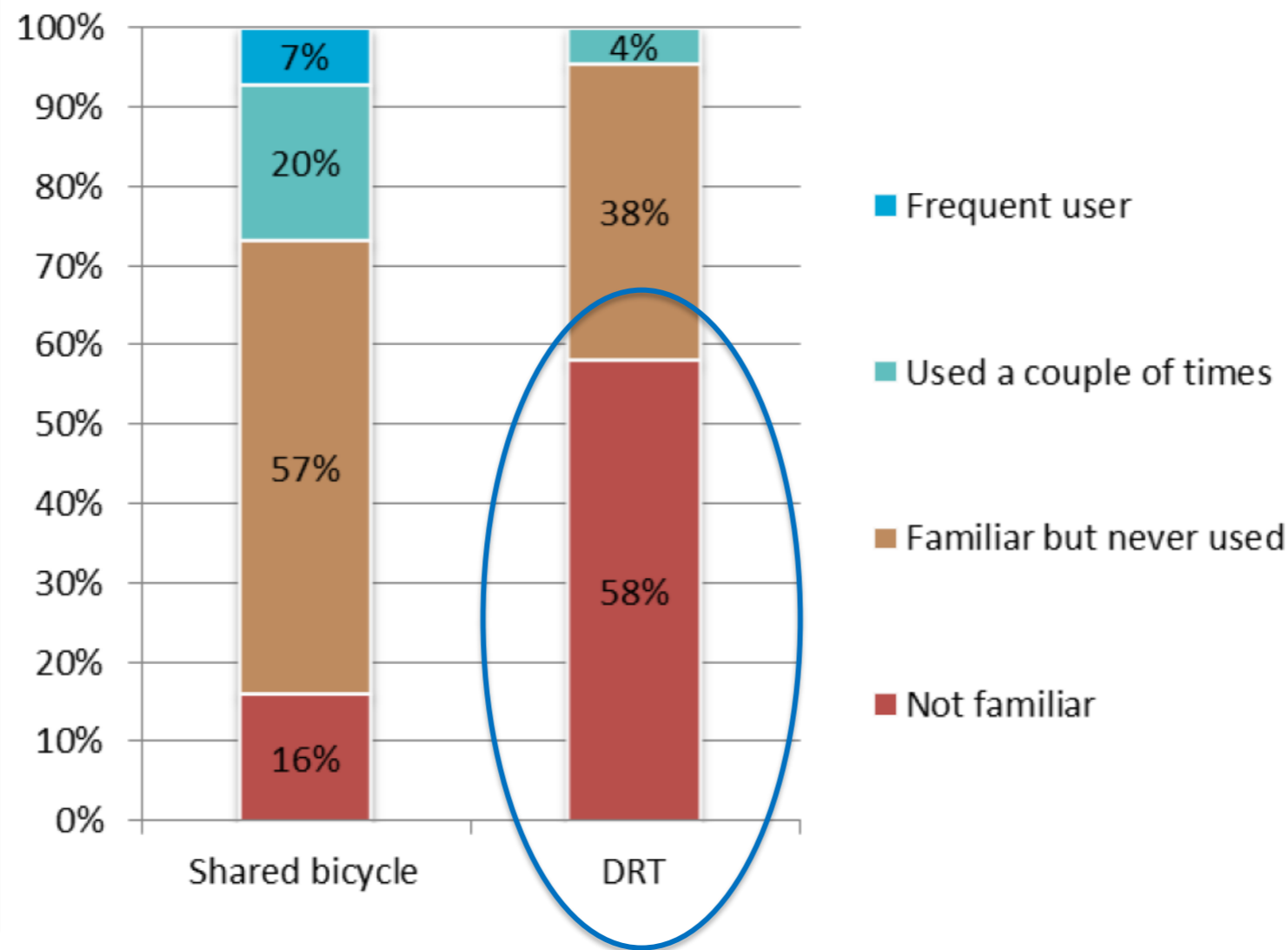
@Niels_van_Oort

Foto: OV Magazine

Flex OV wereldwijd

Region	Active	Inactive	Total	% Active	% Inactive
USA/Canada	17	17	34	50%	50%
UK	12	24	36	33%	67%
AU/NZ	6	7	13	46%	54%
Europe	24	7	31	77%	23%
Total	59	55	114	52%	48%

Active DRT as of 2019

Failed DRT

1970-1984
Early Dial-a-Bus Services

1985-2009
Paratransit / Community Transport Era

2010-2019
ICT Micro-transit Era

Currie en Fournier (2020)

Smart Public Transport

TUDelft

57
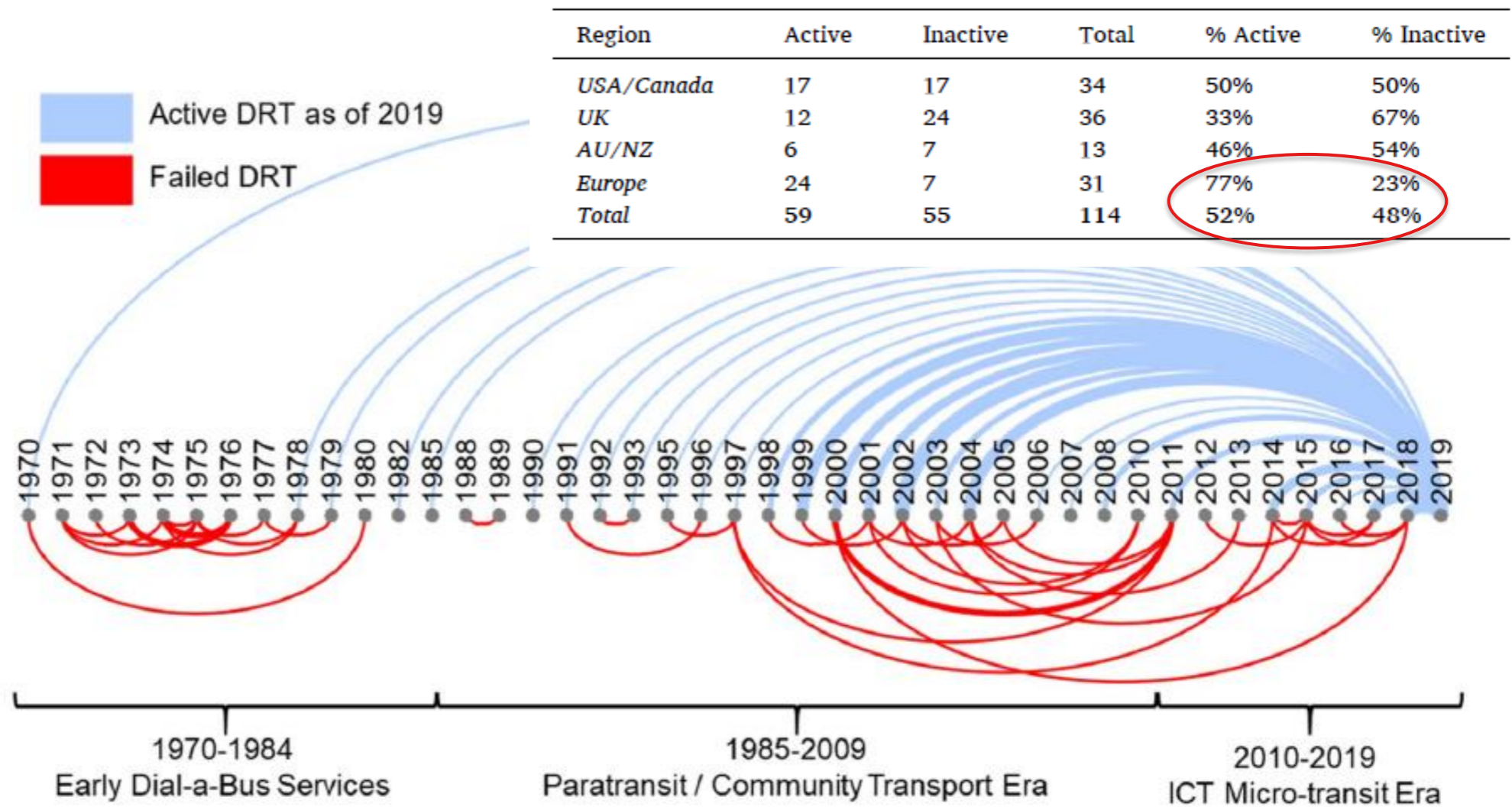
Lessen

- "Increased mobility is rather intangible when compared to the harsh reality of deficits on a balance sheet" [1]

- Koppel aan specifiek vervoer voor rechtvaardiging extra subsidie; WMO?

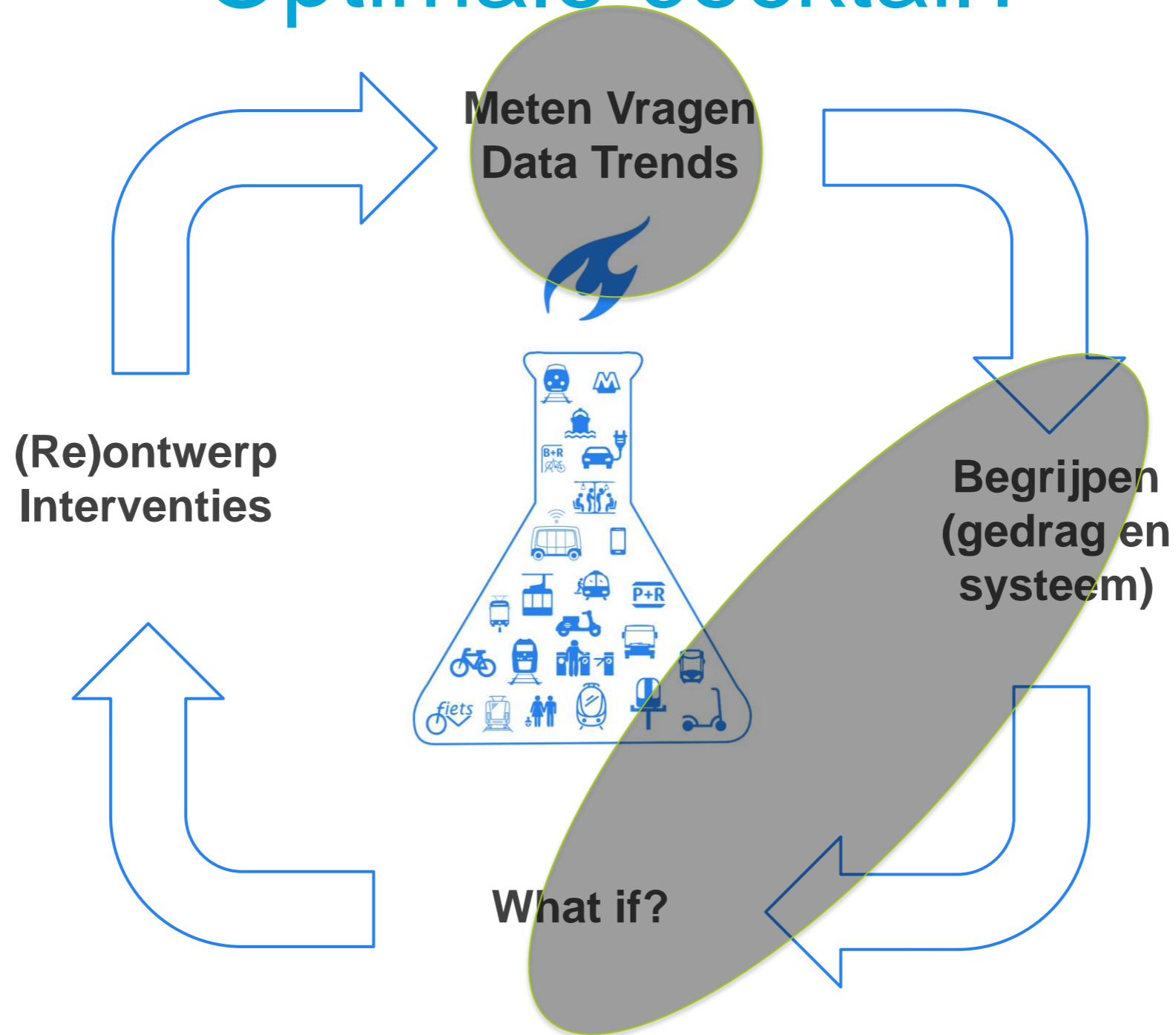- Goede marketing is essentieel

[1]Transport Canada (1978), Currie en Fournier (2020), Alonso-Gonzalez (2018), Coutinho (2020), Bronsvoort (2020), Enoch (2004), Van Oort (2020)
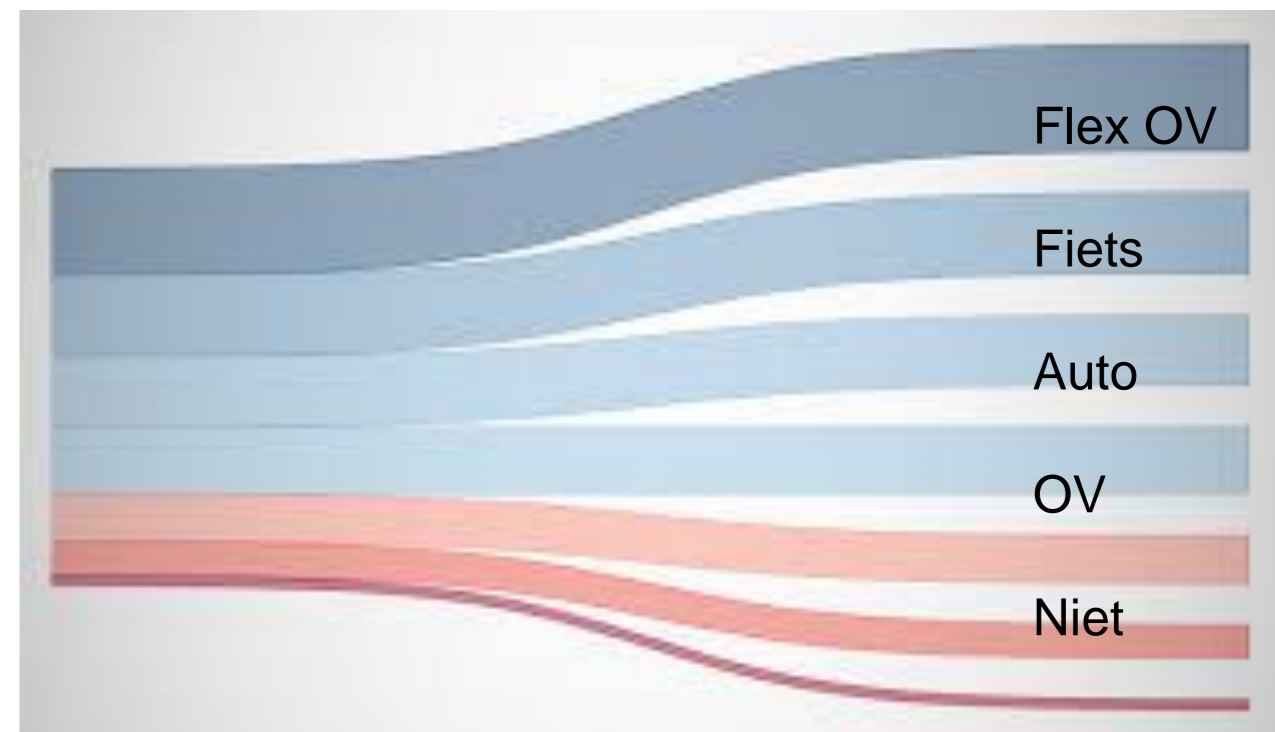
Onbekend maakt onbemind?

Bronsvoort et al. (2020)

Optimale cocktail?

Meten Vragen Data Trends

(Re)ontwerp Interventies

Begrijpen (gedrag en systeem)

What if?

Doelen en modal shift
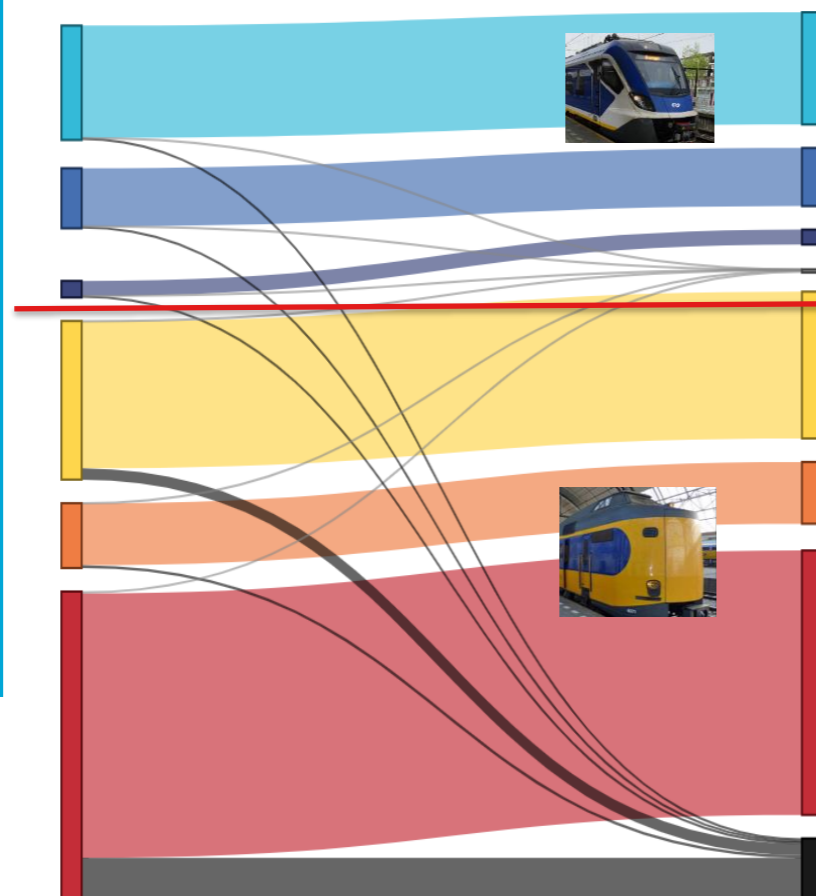

Flex OV

Fiets

Auto

OV

Niet

Fictief voorbeeld modal shift
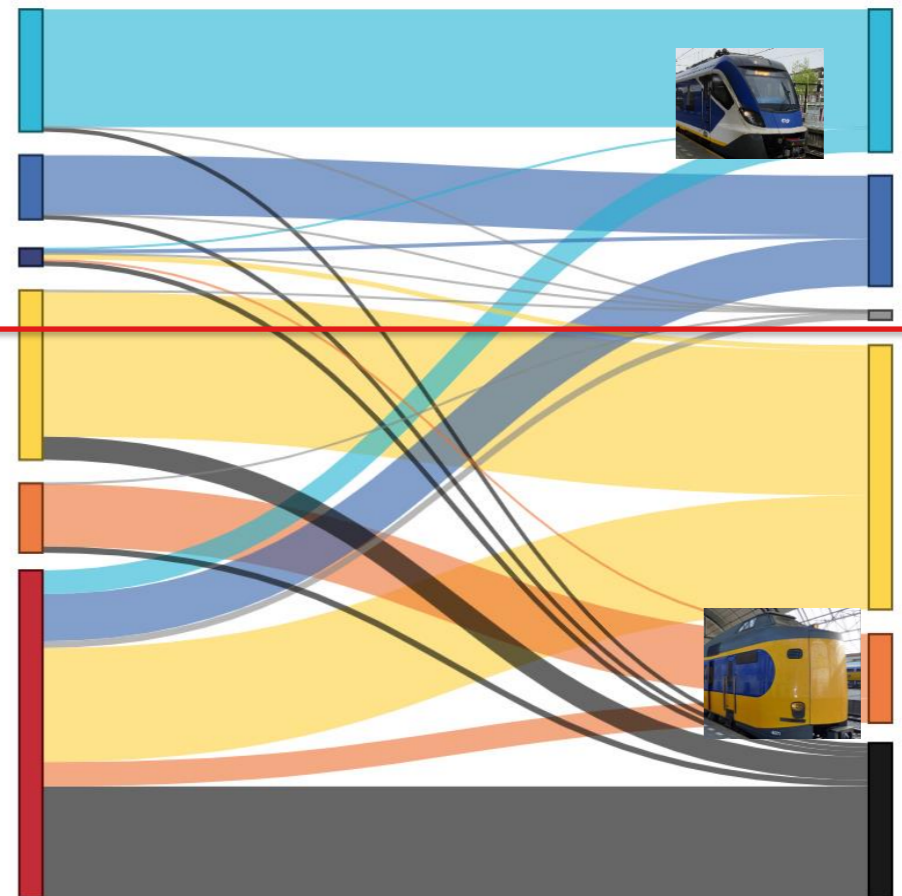
Van Oort et al. (2017)

Flex services to rail stations: modal shift

COMPETITION   **SUBSTITUTION**

Bicycle -> Local

Car -> Local

PT -> Local

FLEX -> Local

Bicycle -> InterCity

Car -> InterCity

PT -> InterCity

FLEX -> InterCity

Gerzinic, N. (2020)
Critical MaaS project

Meer informatie & contact

Dr.ir. Niels van Oort
Smart Public Transport Lab
n.vanoort@tudelft.nl
smartptlab.tudelft.nl/
http://nielsvanoort.weblog.tudelft.nl/