

# Mobilidade como um Serviço: passado, presente e futuro

João Fonseca Bigotte\*

\* Universidade de Coimbra | CITTA – Centro de Investigação em Território, Transportes e Ambiente | Dep. Eng. Civil

# Outline

- 1. Introduction**
- 2. MaaS Demand**
- 3. MaaS Offer**
- 4. The future of MaaS**
- 5. Conclusion**

# 1. Introduction

## What is MaaS?

“Mobility as a Service (MaaS) integrates various forms of transport and transport-related services into a single, comprehensive, and on-demand mobility service.”



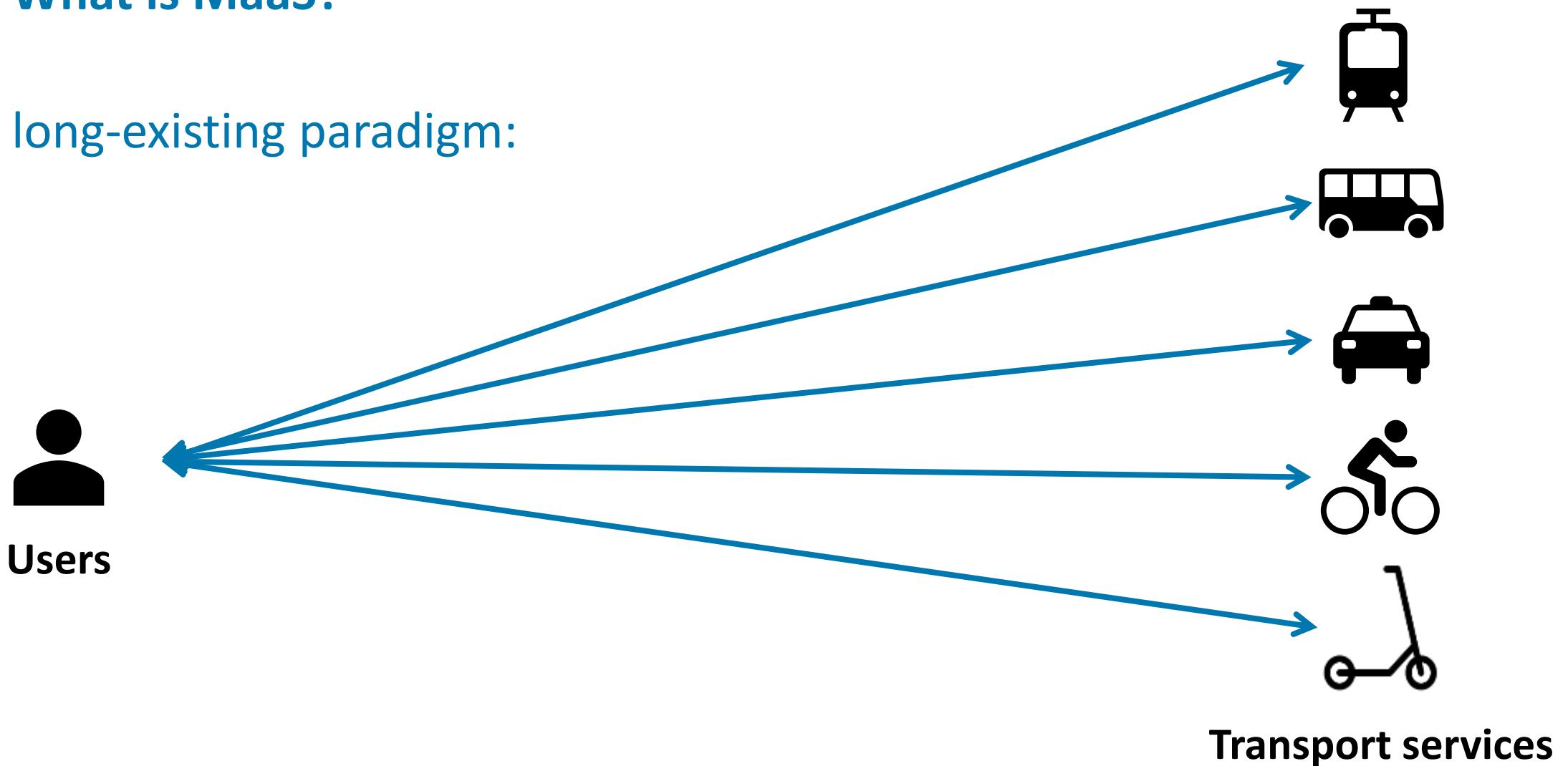
MaaS Alliance

<https://maas-alliance.eu/>

# 1. Introduction

## What is MaaS?

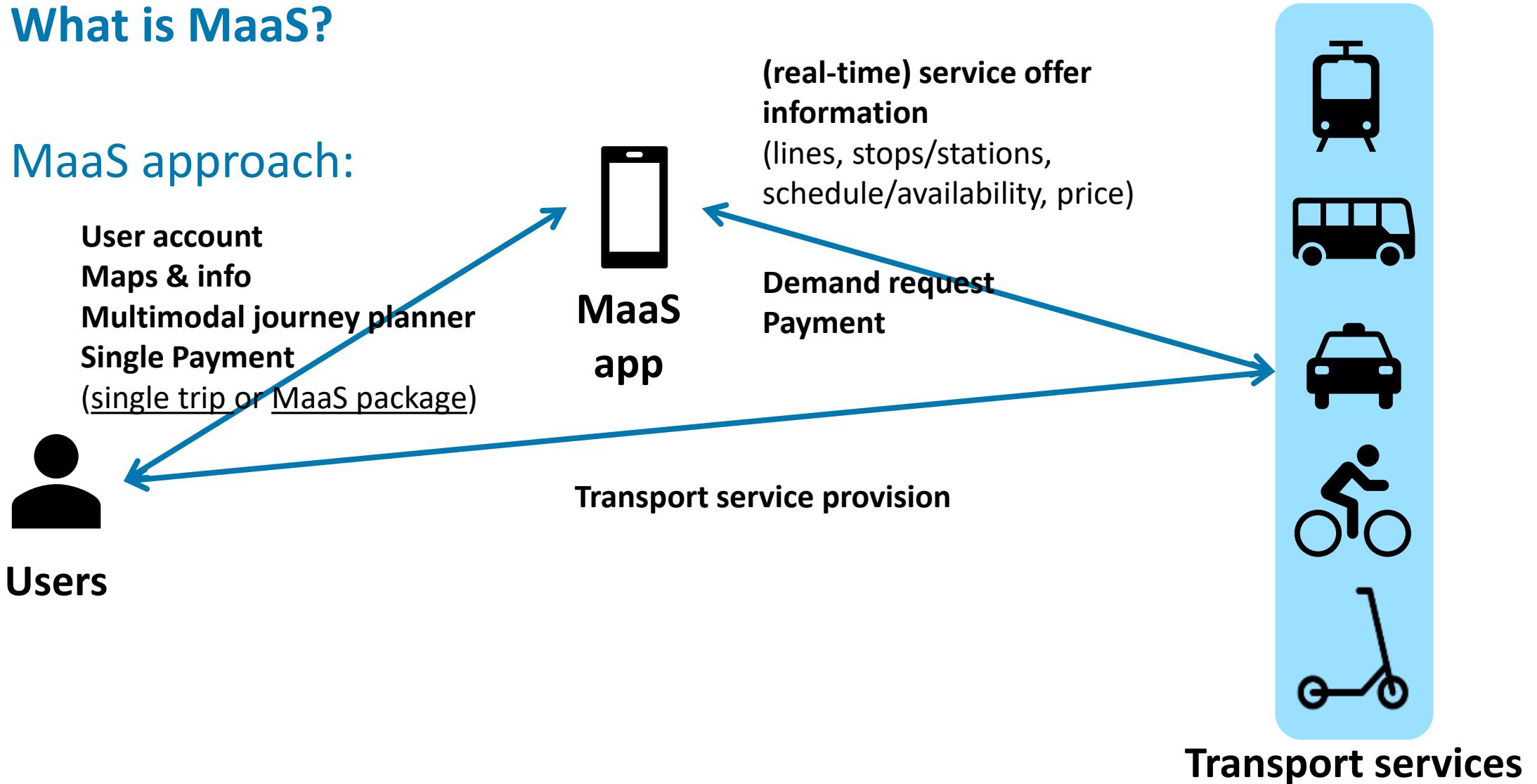
long-existing paradigm:



# 1. Introduction

## What is MaaS?

### MaaS approach:



# 1. Introduction

## The main idea



Fulfill mobility needs without requiring to own a private car or various travel cards/apps from different public transport companies or mobility service providers.

# 1. Introduction

## MaaS promises/claims



### Users

- Access mobility through a single platform
- Single payment
- Tailor-made, door-to-door, on-demand mobil.
- Seamless experience



### Transport operators

- Access to pool of users
- Better demand info
- Opportunity to serve unmet demand



### Cities / Transport authorities

- Increase the transport system efficiency
- Promote sustainable transport
- Reduce congestion and transport externalities

# 1. Introduction

## The origin of MaaS

2014 | M.Sc. thesis



Sonja Heikkilä

**Mobility as a Service**

– A Proposal for Action for the Public Administration

Case Helsinki

Thesis submitted for examination for the degree of Master of Science in Technology.

Esopo 28.04.2014  
Supervisor: Professor Eric Brunn  
Instructors: Ville Lehmuskoski, Sampo Hietanen

ITS & TRA  
MANAG  
SUPPL

2015 | Eurotransport

Sampo Hietanen  
CEO, ITS-Finland

## ‘Mobility as a Service’ – the new transport model?

What if a service provider took care of your mobility requirements and the only choice you would need to make is how many minutes in advance you would need to order your ride? Your operator would take care of all your transportation needs locally and, if chosen, abroad. What would it take to create a package that offers a better service-promise than a privately owned car? Advances in technology are enabling new ways for service offerings and new players are regularly stepping into the mobility market.

The ‘digitalisation-wave’ soon to hit transport

Many industries have been dramatically hit by a wave of digitalisation and transformed services. The telecoms sector, media industry and even the banking sector have radically changed over the last couple of decades. And the biggest change in the media sector was not made by the media companies themselves but by Google and Facebook etc.

Transportation has unchanged struc-

ture since owning a private car became dominant. Nowadays, transport systems are a strange combination of separately financed traffic systems, political decisions and local businesses, and the consumer is always left alone to deal with the differences.

For example, if I wanted to compare the cost of using a taxi, bus, train, airplane, rental car (or a private car) to make a 500km-long journey, the calculation would be very difficult.

Bus transportation is subsidised in one way

and trains in another, and private cars have high start-up costs but usage is relatively inexpensive. A flight ticket is perhaps the only example where all costs are somewhat included in its total price.

‘Mobility as a Service’ – the new transport paradigm

Mobility as a Service (MaaS) is a mobility distribution model in which a customer’s major transportation needs are met over one interface and are offered by a service provider. Typically,

Eurotransport  
Volume 12, Issue 2, 2014



**Sampo Hietanen** · 1st

Owner Aspectu, Founder MaaS Global (Whim app), Advisor

Helsinki, Uusimaa, Finland · [Contact info](#)

15,071 followers · 500+ connections

At that time (2014-15): CEO of ITS-Finland

# 1. Introduction

## MaaS – Where does it come from?

### Antecedents...

- Transport integration
- Multimodality
- ITS

### Triggers

- Digitalization
- Sharing economy
- New Mobility Services  
(NMS)

# 1. Introduction

## MaaS is not all the same → MaaS classification

- Kamargianni et al., 2016: considering the degree of integration, distinguishes between partial/advanced integration.
- Sochor et al., 2018: classifies MaaS schemes based on integration levels (0 to 4).

**Table 1**

Typology of MaaS schemes according to the level of integration.

Integration Categories (Kamargianni et al., 2016)	Integration Levels (Sochor et al., 2018)	Examples
-	4 - Integration of societal goals	
Advanced Integration with mobility packages	3 - Integration of service offers (bundles)	Whim, UbiGo (pilot)
Advanced Integration	2 - Integration of booking & payment	Free2Move, moovel, Jelbi
Partial Integration	1 - Integration of information	Moovit, Qixxit, Google maps
-	0 - No integration	Lyft, Hertz

Source: Hasselwander, M., Bigotte, J. F., Antunes, A.P. & Sigua, R.G. (2022). Towards sustainable transport in developing countries: Preliminary findings on the demand for mobility-as-a-service (MaaS) in Metro Manila. *Transportation Research Part A: Policy and Practice*, 155, 501-518. <https://doi.org/10.1016/j.tra.2021.11.024>

# 1. Introduction

## MaaS is not all the same → MaaS classification

- Orozco-Fontalvo et al. (2024). IMPReSS: a comprehensive method to classify MaaS systems, Transport Policy 155, 234-241.

Complexity/Relevance order	Feature	Question
1	Societal goals and values	Are local, regional and/or national policies and goals integrated into the service?
2	Service subscription	Does it offer more than one subscription option?
3	Booking & Reservation	Is it possible to book within the app?
4	Payment (Seamless)	Is it possible to pay within the app?
5	Multimodal options	Does it include public transport and other modes?
6	Information access	Does it include a multimodal trip planner, providing different travel alternatives?

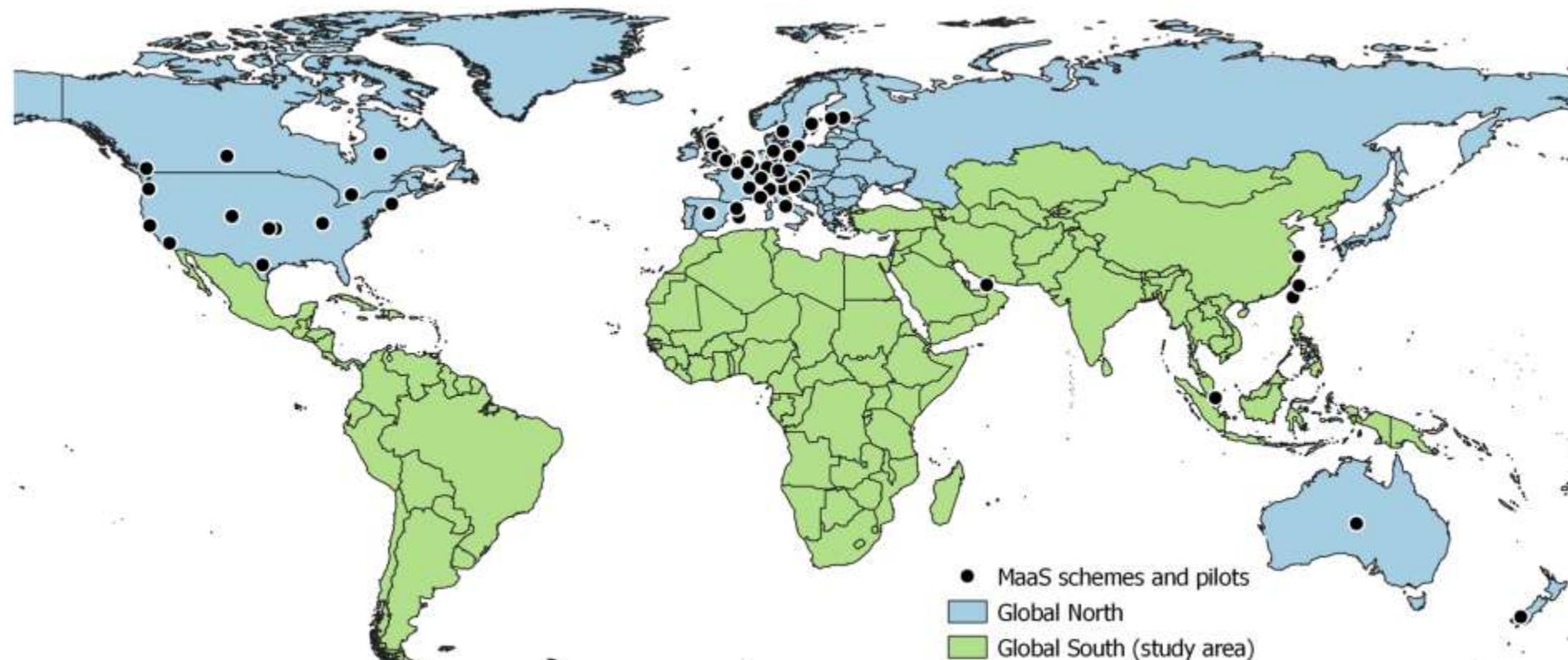


Information access	Multimodal options	Payment (Seamless)	booking or Reservation	Service subscription	Societal goals and values
1 (included)	1 (included)	1 (Included)	0 (absent)	1 (included)	0 (absent)

## 2. MaaS Demand

# Introduction

## MaaS trials



**Fig. 1** Worldwide MaaS penetration: Map of existing MaaS schemes and pilots as of 2019. (Data source: MaaS-Alliance)

Source: Hasselwander, M. & Bigotte, J.F. (2023). Mobility as a Service (MaaS) in the Global South: research findings, gaps, and directions. European Transport Research Review, 15, 27. <https://doi.org/10.1186/s12544-023-00604-2>

## 2. MaaS Demand

### MaaS adoption

### Recent review (SLR)

Kriswardhana and Esztergar-Kiss (2023):

Total of 29 scientific studies (no grey literature)

- revealed preference: 3
- stated preference: 26

Author	Country	Number of respondents	Experiment design	Modeling technique
Sochor et al. (2016)	Sweden	195	RP	-
Ho et al. (2018)	Australia	252	SP	MNL
Matyas and Kamargianni (2019b)	UK	1068	SP	MNL
Floreze et al. (2019)	Netherlands	568	SP	LCCA, Regr.
Ho et al. (2020)	Australia, UK	290	SP	MNL
Caiati et al. (2020)	Netherlands	1078	SP	MNL
Feneri et al. (2020)	Netherlands	1010	SP	ECLogit
Vij et al. (2020)	Australia	3985	SP	LCCM
Guidon et al. (2020)	Switzerland	998	SP	MNL
Polydoropoulou et al. (2020b)	UK	N/A	SP	HCM
Ye et al. (2020)	China	600	SP	SEM
Jang et al. (2020)	Netherlands	1078	SP	MNL
Alonso-Gonzalez et al. (2020)	Netherlands	1006	SP	LCCA
Schikofsky et al. (2020)	Germany	1067	SP	PLS-SEM
Zijlstra et al. (2020)	Netherlands	1547	SP	CFA, Regr.
Hoerler et al. (2020)	Switzerland	995	SP	BLR
Mola et al. (2020)	French, Finland	201	SP	SEM
Tsourous et al. (2021)	UK	574	SP	MNL
Lopez-Carreiro et al. (2021b)	Spain, Netherlands	1418	SP	GOLogit
Lopez-Carreiro et al. (2021a)	Spain	1000	SP	CFA
Ho et al. (2021)	Australia	150	RP	MNL
Sujeon Kim et al. (2021b)	South Korea	161	SP	Regr.
Hensher et al. (2021)	Australia	150	RP	BLM
E. J. Kim et al. (2021a)	South Korea	331	SP	MNL
Farahmand et al. (2021)	Netherlands	236	SP	MNL
Ko et al. (2022)	South Korea	781	SP	OPM
Hasselwander et al. (2022)	Philippines	238	SP	BCM
Matowicki et al. (2022)	UK, Poland	6405	SP	MNL
Seheon Kim and Rasouli (2022)	Germany	1299	SP	HCM

## 2. MaaS Demand

### MaaS adoption factors



#### Users

##### Socio-demographic characteristics

- Age ↓, MaaS ↑ (but Manila: across all groups)
- Educational level ↑, MaaS ↑
- Access to car ↑, MaaS ↓ (but NED: no)
- Tech adoption (apps) ↑, MaaS ↑
- Male / Female: no clear effect

##### Travel habits and attitudes (+)

- Inter/multimodal travellers ↑, MaaS ↑
- Shared mobility ↑, MaaS ↑
- Avg. daily travel distance: no clear effect

## 2. MaaS Demand

### MaaS adoption

#### Reasons for adoption

- Convenience
- Reliability
- Cost reduction
- Environmental sustainability (but Manila: no effect)
- Information and ticket/payment integration
- Personalization / Tailor-made

### 3. MaaS Offer

### 3. MaaS Offer

#### Diffusion of MaaS (vs ride-hailing)

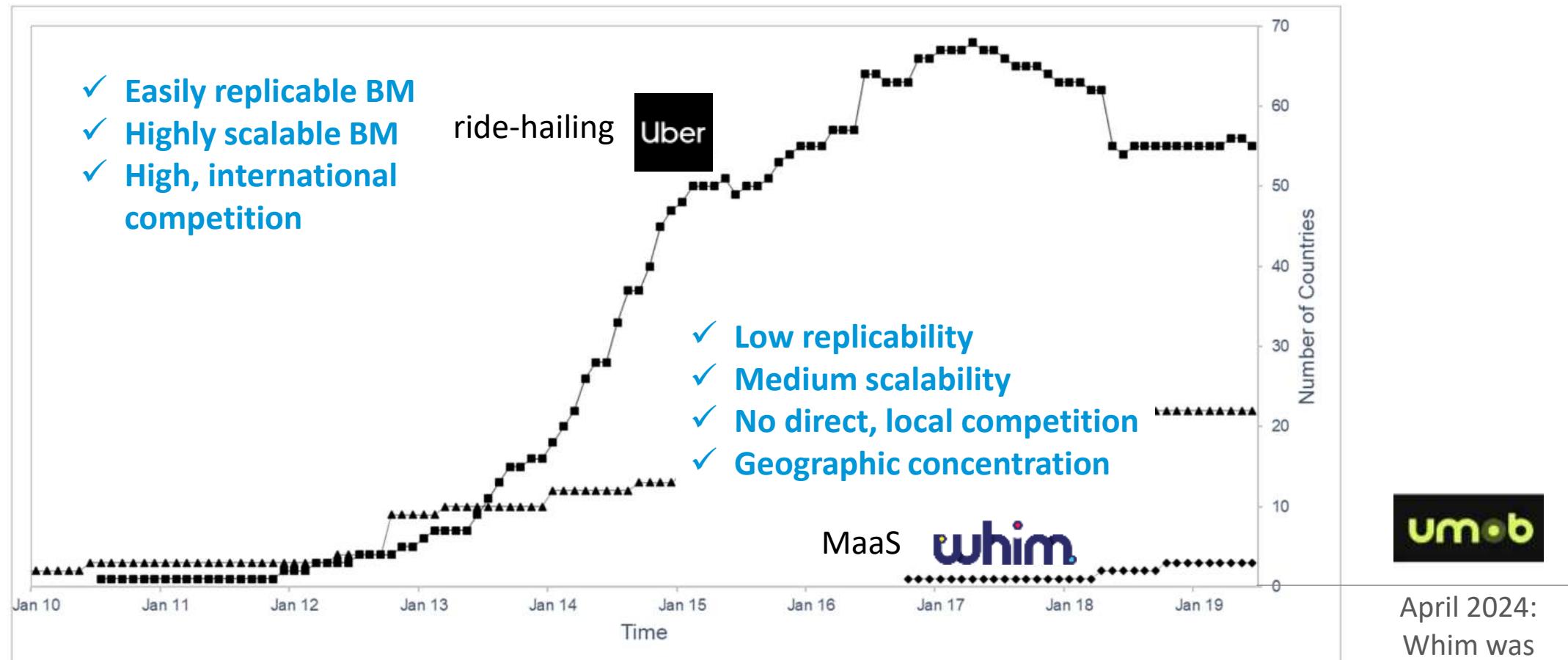


Fig. 6. Expansion of market leaders over time (Jan 2010 – Jun 2019).

Source: Hasselwander, M., Bigotte, J. F., & Fonseca, M. (2022). Understanding platform internationalisation to predict the diffusion of new mobility services. *Research in Transportation Business & Management*, 43, 100765. <https://doi.org/10.1016/j.rtbm.2021.100765>

### 3. MaaS Offer

#### MaaS ecosystem / stakeholders

- Transport authorities
- Transport service providers
- Customers / end-users
- Tech solutions and infrastructure (e.g. ticketing and payment, journey planners, ICT infra.)

#### ➤ New roles!!

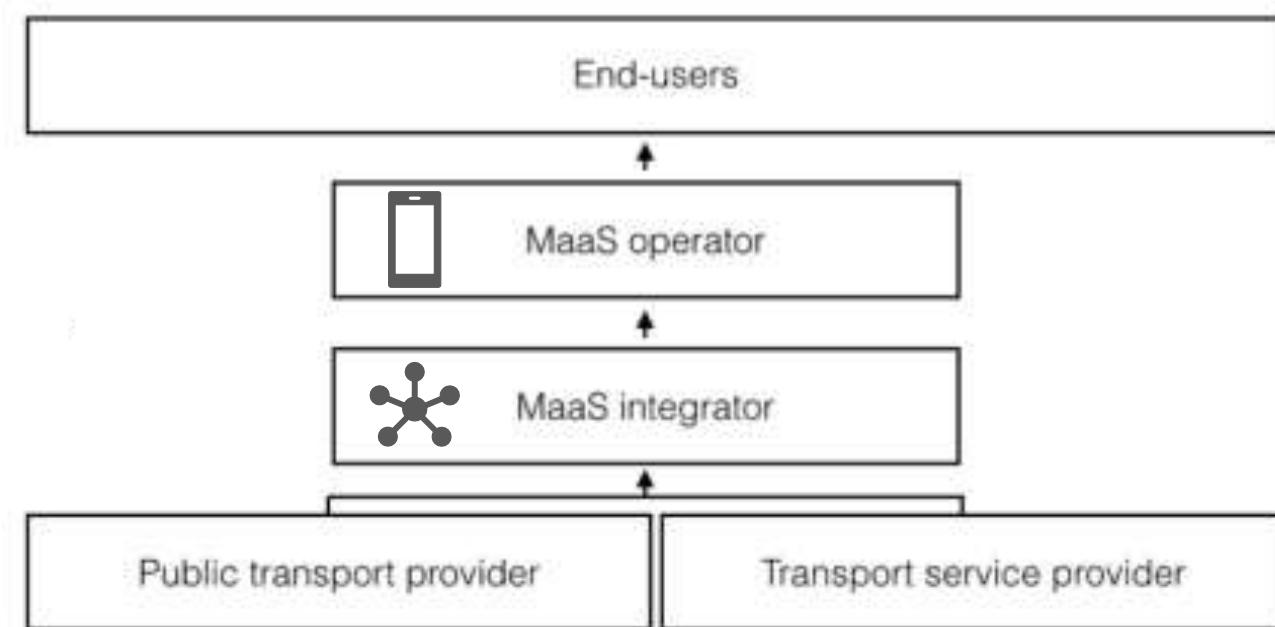


MaaS operator(s)



MaaS integrator

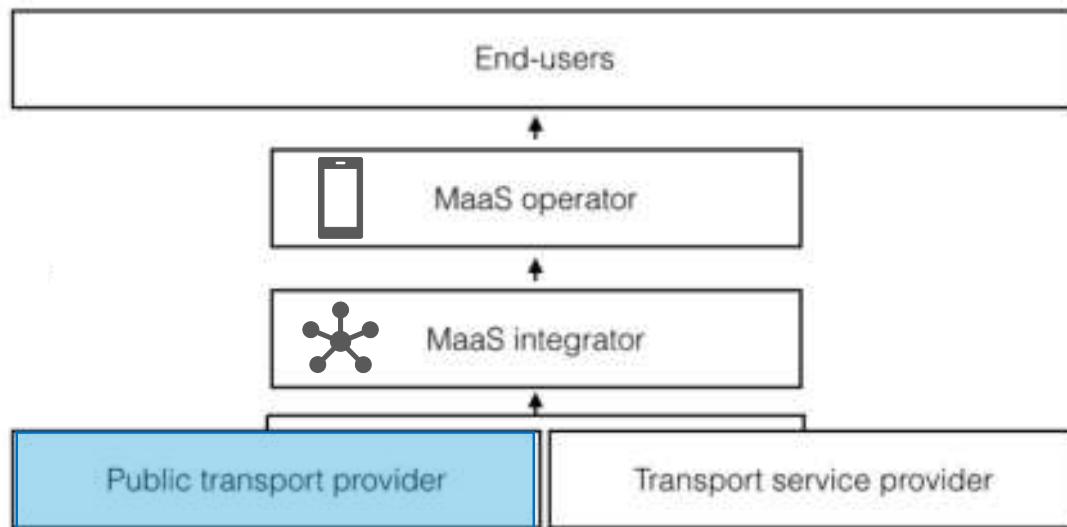
Source: Smith et al. (2018). MaaS: Development scenarios and implications for public transport. Research in Transportation Economics, 69, 592-599.



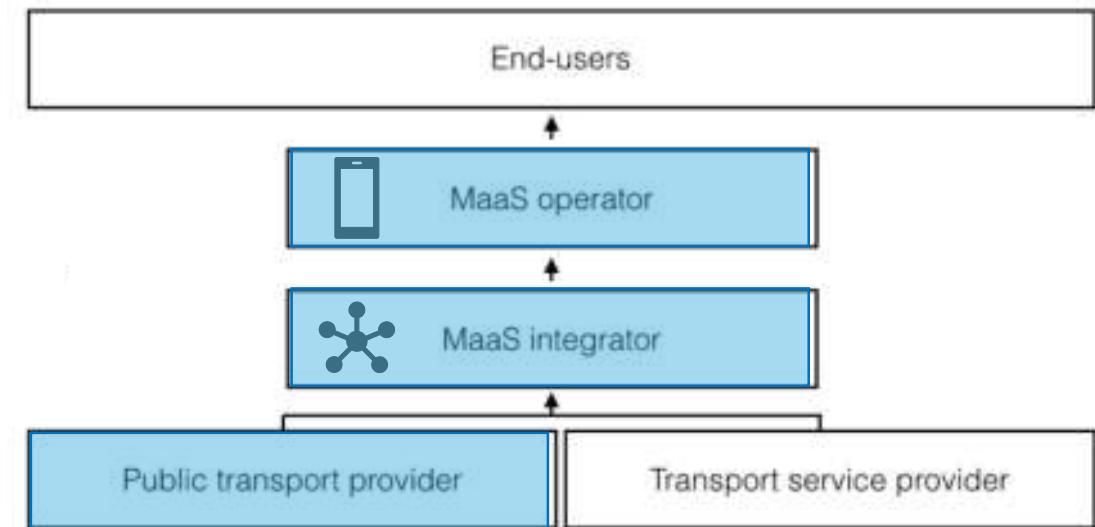
### 3. MaaS Offer

## MaaS governance models / development scenarios

### Market-driven



### Publicly-controlled

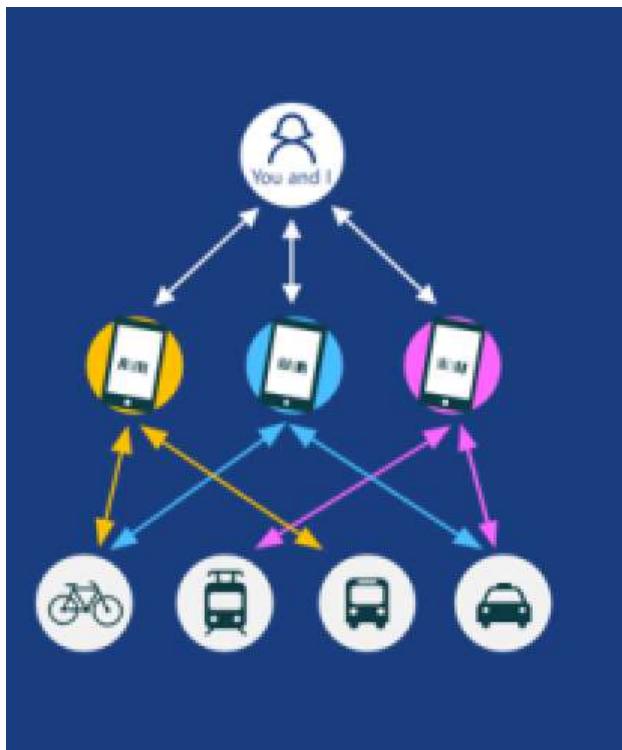


 Public sector role

### 3. MaaS Offer

## MaaS governance models / development scenarios

Market-driven



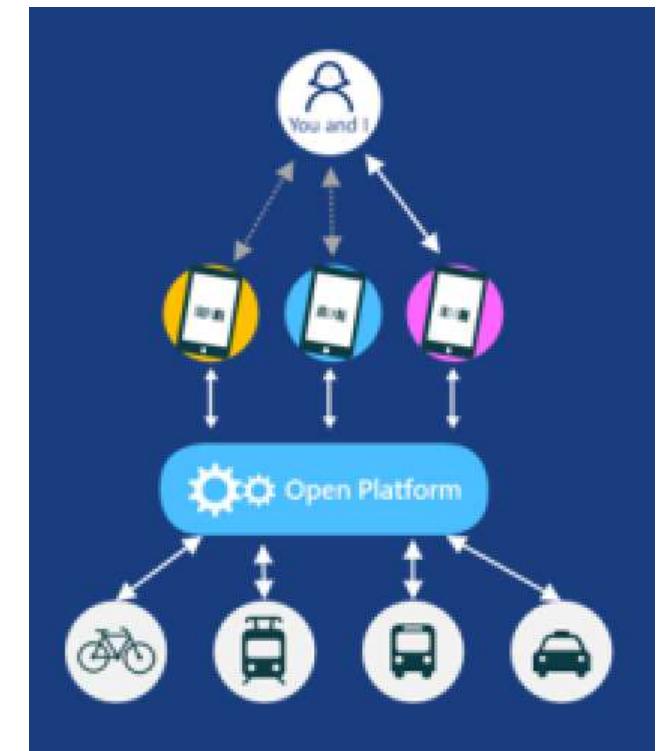
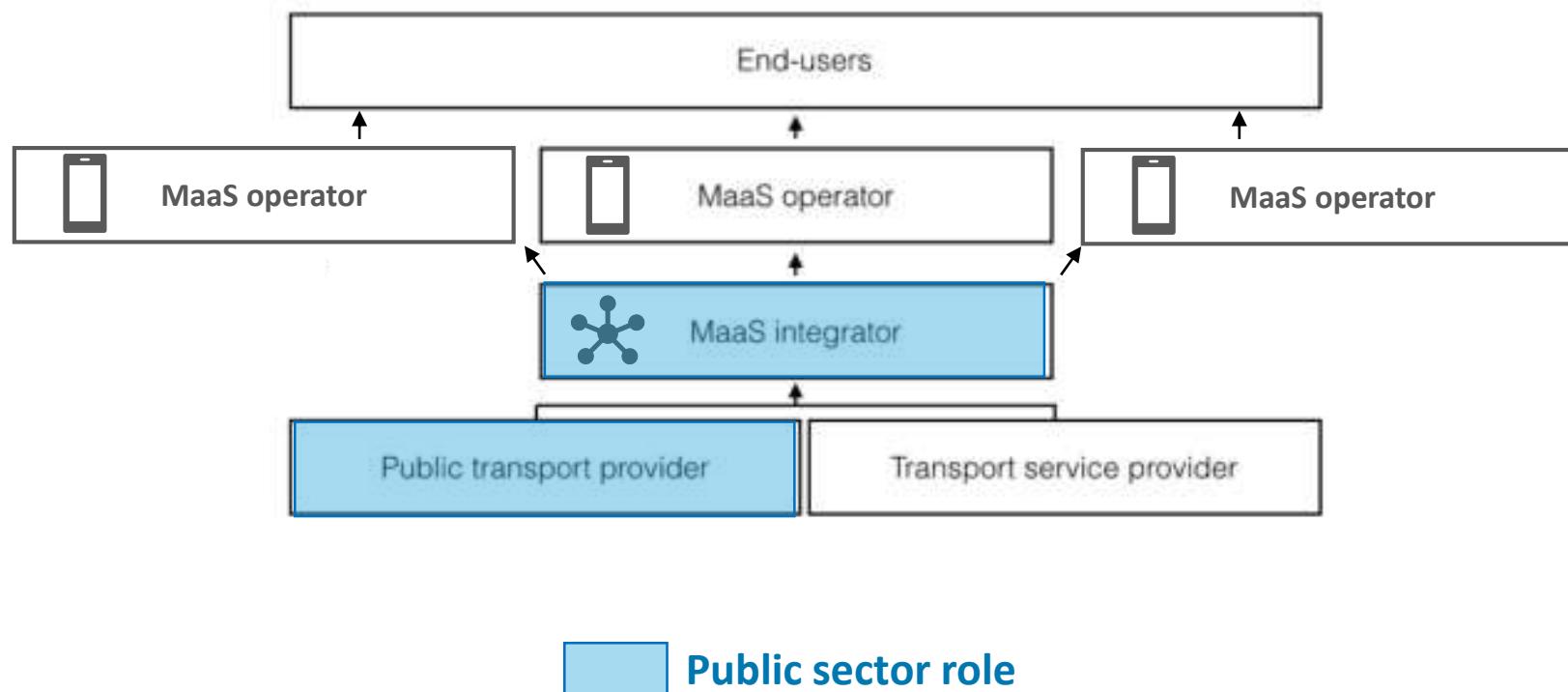
Publicly-controlled



### 3. MaaS Offer

## MaaS governance models / development scenarios

### Public-Private Partnership (PPP)



### 3. MaaS Offer

#### **MaaS business model**

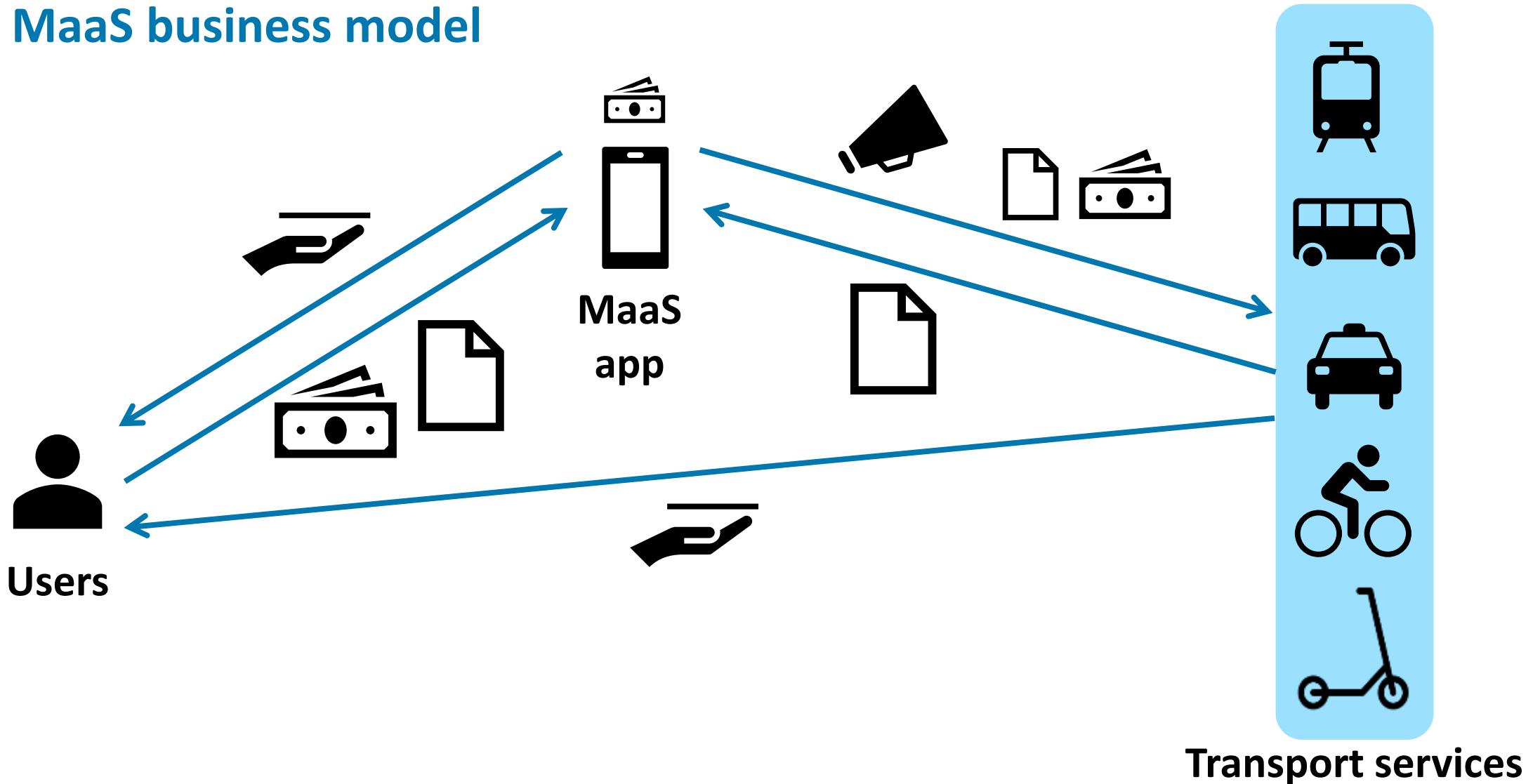
➤ It is a digital platform business model.

##### Key aspects:

- Bring together 2 or more distinct but interdependent groups of customers.
- Create value by promoting and facilitating interactions between the groups.
- The larger the number of customers of one group the more interesting to the other group.
- At least one group must be willing to pay.

### 3. MaaS Offer

#### MaaS business model

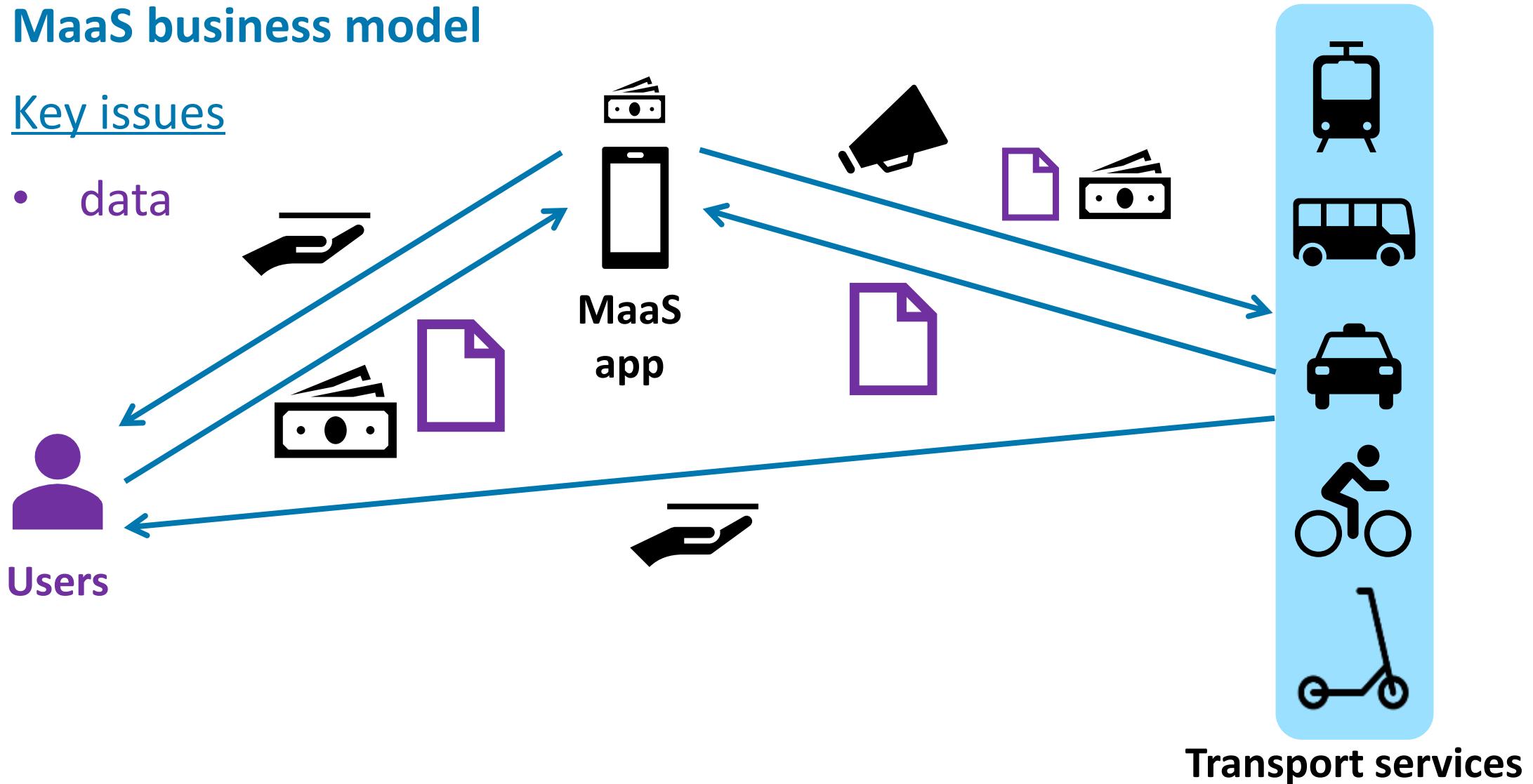


### 3. MaaS Offer

#### MaaS business model

##### Key issues

- data

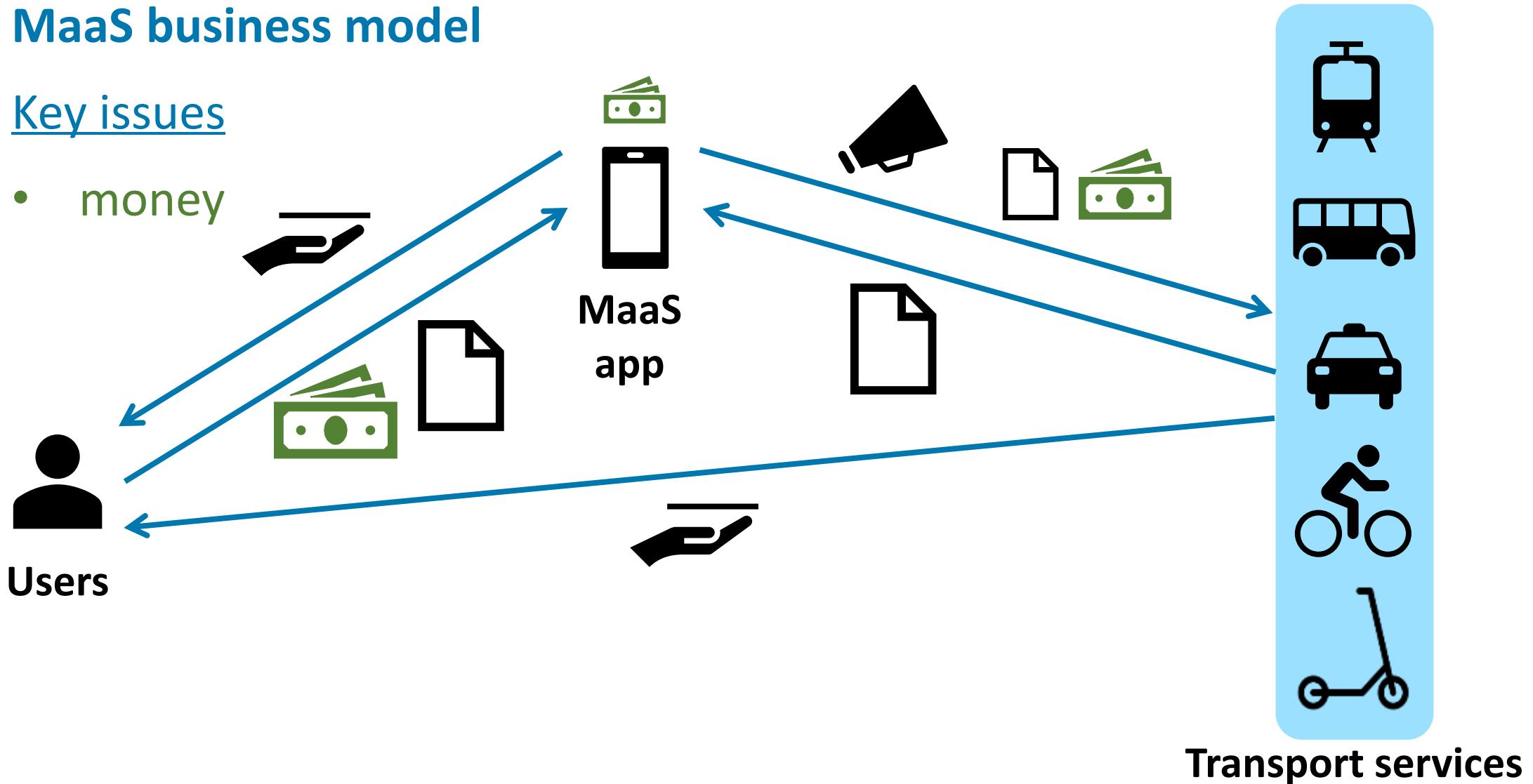


### 3. MaaS Offer

#### MaaS business model

##### Key issues

- money



## 4. The future of MaaS

## 4. The future of MaaS

### MaaS promises/claims – some are not yet proven and raise serious doubt



#### Users

- Access mobility through a single platform
- Single payment
- Tailor-made, door-to-door, on-demand mobil.
- Seamless experience



But...

#### Reasons for adoption

- Convenience
- Reliability
- **Cost reduction**
- Environmental sustainability
- Information and ticket/payment integration
- Personalization / Tailor-made

## 4. The future of MaaS

### MaaS promises/claims – some are not yet proven and raise serious doubt



- **What about my current users?**
- **OK, but who owns the data?**
- **OK, but what about unit economics?**

## 4. The future of MaaS

### MaaS promises/claims – some are not yet proven and raise serious doubt

	Cities / Transport authorities
<ul style="list-style-type: none"><li>– Increase the transport system efficiency</li><li>– Promote sustainable transport</li><li>– Reduce congestion and transport externalities</li></ul>	



- Individual choices + Limited capacity VS system efficiency & societal goals
- reduce cars trips OR increase use of car-based services (in bundles)
- Profit comes from increase in use

## 4. The future of MaaS

### Key questions

- How can MaaS create more value for the user than the sum of the individual offerings?
- How can MaaS add value to transport service providers? How do we fix the MaaS business model?
- What is the most adequate governance model / development scenario?
- Can MaaS truly promote sustainable mobility? What should the role of car-based services be? (What about AVs)?
- Can MaaS contribute to equity? (no promises/claims about equity)

## 4. The future of MaaS

### Emerging trends

- **Superapps**
- **Mobility as a Feature (MaaF)**

Travel is a derived demand.  
Shift from multimodal mobility to multi-service perspective.



# 5. Conclusion

## 5. Conclusion

### Key insights

- ✓ There is still a long way to go until MaaS fulfills its promises.
- ✓ MaaS is evolving to MaaS 2.0
- ✓ It's the right time to work and do research about MaaS!

# Get in touch!



**João Fonseca  
Bigotte**



[jbigotte@dec.uc.pt](mailto:jbigotte@dec.uc.pt)



[orcid.org/0000-0002-0324-2406](https://orcid.org/0000-0002-0324-2406)



[Linkedin.com/joaofonsecabigotte](https://www.linkedin.com/joaofonsecabigotte)

