

# Public Policy Framework supporting “Mobility as a Service” implementation

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Views on MaaS

Knowledge

Insight & Inspiration

Create, combine, and  
structure

1. How others define MaaS?
2. Public Policy, Policy instruments & nature of decisions within the Urban Mobility System
3. Finland's MaaS case study
4. **Proposal** | 4.1 - MaaS Conceptualization and MaaS Topology  
| 4.2 - Public Policy Framework for MaaS implementation
5. Conclusions

# O. World and Urban Mobility Context & trends

- Continuous **growth of World Population**  
(9.8 billion in 2050) | Demographic transition “Population Ageing”
- Rising **urbanization**  
(from 55% in 2017 - to 68% in 2050)
- Increasing **levels of congestion**  
(costing 1% of the EU’s GDP annually – €100 billion Eur)
- **Digitalization** megatrend  
(> mobile subscriptions than people ) | Industry 4.0 | IOT | the Cloud | Big Data
- From **“Ownership”** to **“Usership”**  
(Sharing Economy in EU: €28.1 bn transactions - 2016)

# 1. What is MaaS ?



- “a new mobility concept”
- “a paradigm shift”
- “a systemic innovation”
- “a new way of thinking”
- “a disruption in mobility”
- (...)

3 approaches were found:

- I. MaaS exists when a specific action occurs (and it is defined by it)
- II. MaaS is what happens when some conditions exist (no direct action needed for MaaS to exist)
- III. MaaS understood as a Mobility Distribution Model (a model that enables a set of conditions that allow afterwards the occurrence of specific actions within the mobility system)

## 2. Public Policy & Policy instruments

► **Public Policy** – “Anything a government chooses or not to do” (Dye, 2013)



Composition of: **Policy Goals** + **Policy Means** (Lasswell, 1958)

► **Policy Instruments** : Tools of governance - “The means and methods by which governments effect their policies” (Howlett & Ramesh, 1993)

		Governing resource				
		Information	Authority	Treasure	Organization	
Purpose of tool	Substantive	Public Information Campaigns	Independent regulatory agencies	Subsidies and grants	Public enterprises	{ Substantive - those directly providing goods & services }
	Procedural	Official secret acts	Administrative advisory committees	Interest-group funding	Government reorganizations	

Taxonomy of Policy Instruments (Howlett, 2011)

## 2. Decision Levels in Public Policy & Stakeholders

### ► Urban Mobility Management System Decision Levels (Macário, 2011)



with focus on Public Policy:

- **Strategic level** *policy formulation phase*  
where the rationale behind the policy is established - **“Why?”**
- **Tactic level** *policy implementation phase*  
where strategies, goals and visions (the Why) are matched with packages of policy tools (means) leading to its operationalization – **“How?”**
- **Operational level** *relates to “evaluation and monitoring”*  
where it is decided specifically **“What”** to do ensuring the compliance with the strategical goals (“Why”) and the enabling policy means (“How”)

### ► Nature and role of **entities considered (groups of stakeholders)** :

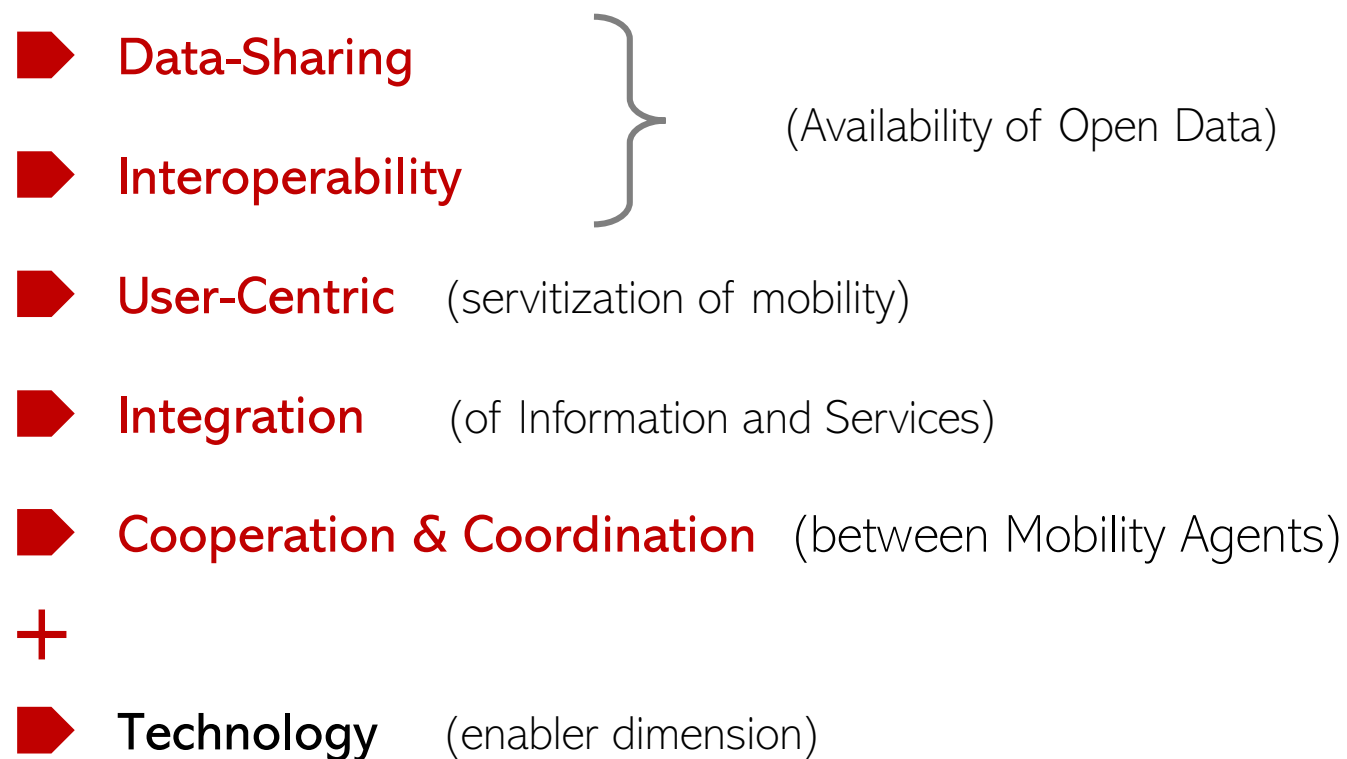
e.g.: Political and Regulating Authorities / Technical authorities and agencies / Operators / Suppliers / Clients / Other interest parties  
(NGO; Academia, etc.)

### 3. MaaS case-study: Finland



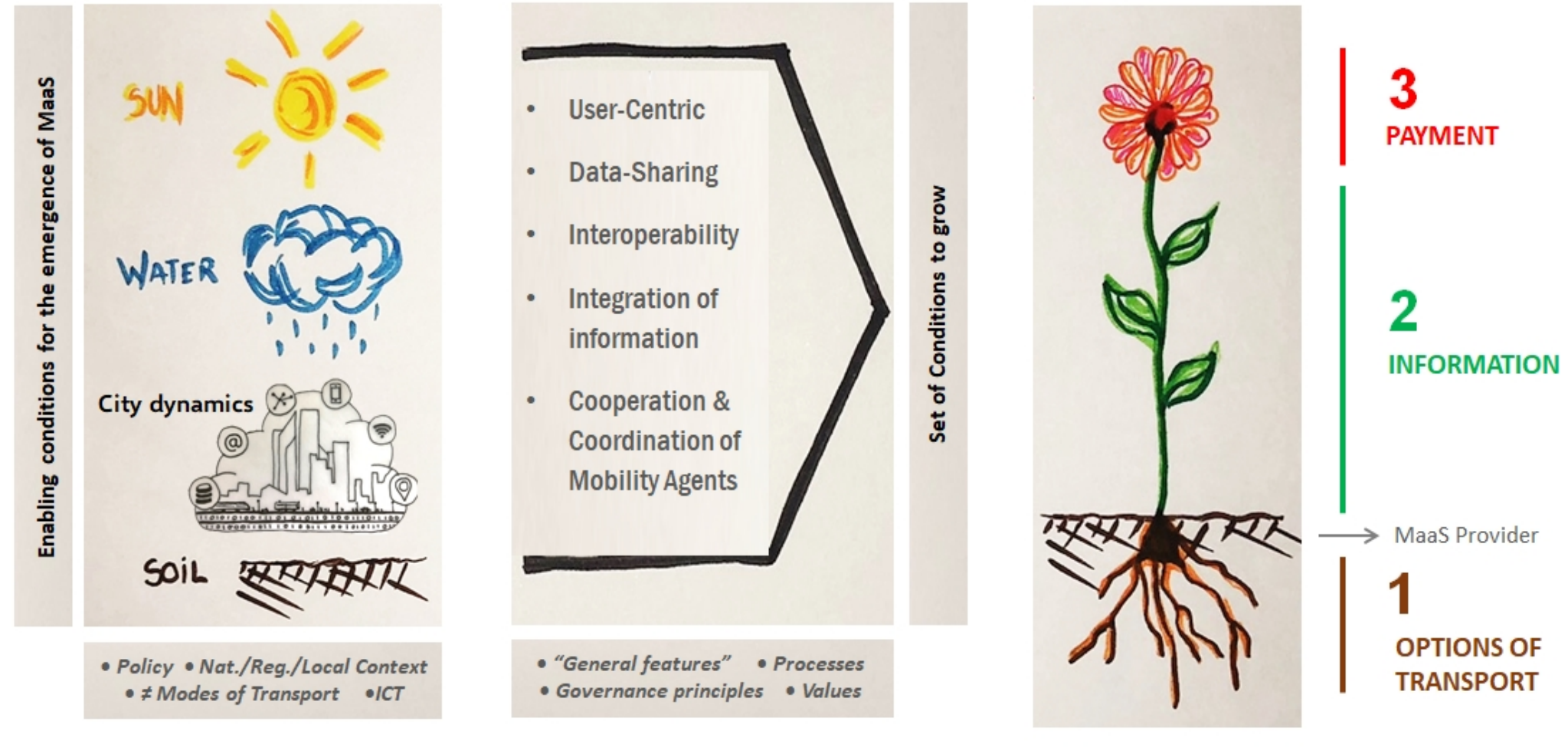
## 4.1 MaaS: General features

Represent the **governance principles** established outside the system or  
are **materialized** by the **existence of a set of features**





# MaaS Flower Model



# 1st Pillar – “Diversity of Transport Services”

Diversity of transports is the basis for a “MaaS system”:

- ▶ **Degree of choice** – associated with nature of transport services  
*“collective” or “individual” & “self-service” or “non self-service”*
- ▶ **“Geographic area’s Capilarity”** – aggregated offer available (diversity)  
*potentially enhancing the “seamless mobility experience” of the user*

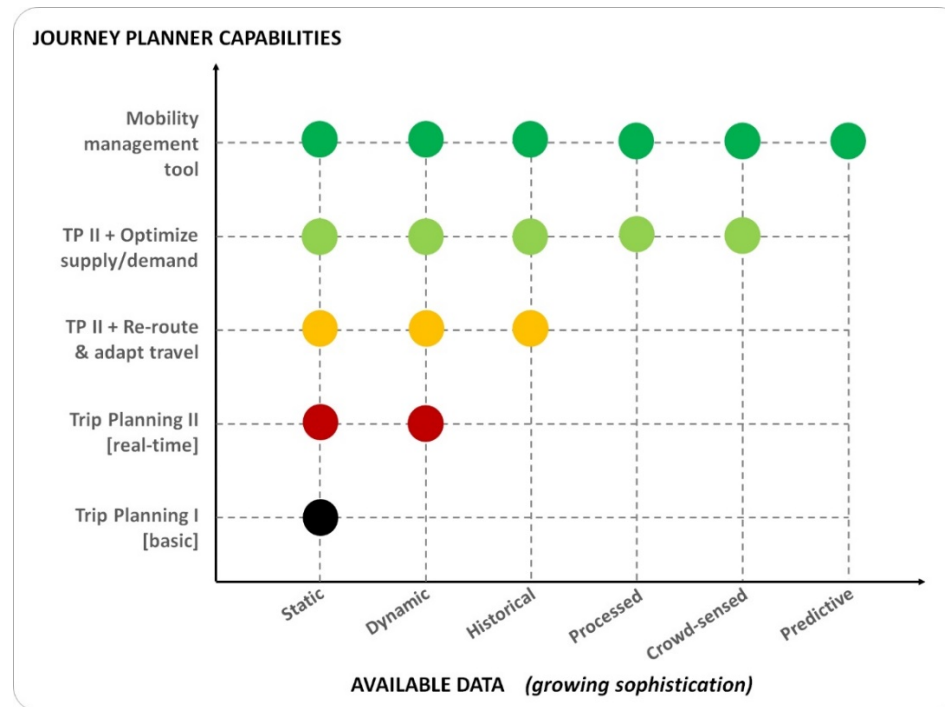
The capilarity of transport services is highly dependent on context

C1 – Transport Services
1. ‘Self-service’ transport (only)
2. ‘Non-self-service’ transport (collective or collective and individual);
3. ‘Non-Self-Service’ (collective or collective and individual) and ‘Self-Service’ collective transport;
4. ‘Non-Self-Service’ (collective or collective and individual) and ‘Self-Service’ (individual or collective and individual) transport.

## 2nd Pillar – “Information”

### Information perceived as an “enabler of choice”

- ▶ Digital & based on a “One-Stop-Shop” principle
- ▶ “Journey Planner” as central element in the provision of information
- ▶ Access to open data conditions its capabilities and maturity (*type of data available*)



#### C2 - Information

**1. Static Multimodal Journey Planner** (“Static” data)

**2. Dynamic Multimodal Journey Planner** (“Real-time” data)

**3. Assistant & Dynamic Journey Planner I** (“User preferences” data)

**4. Assistant & Dynamic Journey Planner II** (“Crowd-sensed” data)

**5. Assistant & Dynamic Journey Planner III** (“Predictive” data)

**6. Intervention, Assistant & Dynamic Journey Planner**

Payment perceived as an “enabler of use”

- Access to open sales interfaces
  - Possibility of reselling tickets by 3<sup>rd</sup> party (single & seasonal)
  - Single payment (e-payment) & One Ticket
- 
- ▶ “Physical” or “Electronic” access to the transport services
  - ▶ Besides Pay-as-you-go (PAYG), the existence of “Mobility Packages”/“Bundles”
  - ▶ Flexibility and diversity valued

C3 - Payment
1.Pay-as-you-go (PAYG) (physical access only)
2. Pay-as-you-go (PAYG) (electronic possibility)
3.PAYG and Single Subscription (physical access only)
4.PAYG and Single Subscription (electronic possibility)
5.PAYG and Fixed Subscription (electronic possibility)
6.PAYG and Flexible Subscription (electronic possibility)

## 4.1 MaaS Topology: MCDA model

**MaaS Topology** aims to structure different possible configurations of “MaaS Systems”



**Topology** – study of space    ►    “3 MaaS Pillars” will correspond to a “3-D representation” of a MaaS System

a Multicriteria Decision Analysis model (additive model) was applied

allowing a coherent and consistent transformation of each criterion Local Values in Global Values :

$$V(a) = \sum_{j=1}^n w_j v_j(a) \quad , \quad \text{with} \quad \sum_{j=1}^n w_j = 1 \quad \text{and} \quad w_j > 0 \quad (j = 1, \dots, n)$$

where:  $V(a)$  is the overall value of option  $a$ ;  $v_j$  is the (partial) value of option  $a$  on criterion  $j$  and  $w_j$  is the weighting coefficient of criterion  $j$ , with  $j = 1, \dots, n$ .

- 1<sup>st</sup> Phase : Structuring – definition of criteria (3 pillars) and descriptors of performance
- 2<sup>nd</sup> Phase: Evaluation – creation of value functions and calculate criterion weights
- 3<sup>rd</sup> Phase: Testing – application of the MCDA

## 4.2 Public Policy Framework Proposal

« MaaS is a **mobility management model** that allows the emphasis of a **value proposal** and its articulation with supply and demand, **ensuring all the means of information and transaction** between the two market sides, and **where it is also enabled the feeding of monitoring functions** that the authority intends to wield »

“Who?”  
should do  
“What?”  
and  
“How?”



1

Identify the nature of “**Decisions**” associated with each “**Feature**” of a “MaaS System”

2

By each “**Feature**” identify which **types of policy instruments** would best fit the purpose or the enabling of that feature, and which **indicative group of Stakeholders** would be responsible for its implementation

By each feature understand which **Decision Levels** should take **action**

 Required
  Optional
  Absent

- ▶ Features comprehending *“required” action* in **all** Levels correspond to **essential core** features of a MaaS System
- ▶ Essentially are related with provisions on **“data-sharing”** and **“interoperability”** as well as **“open sales interfaces”**
- ▶ *“Optional” action*, is related with **context**, whether by the “governance of the system” or dependent on the business models

		Decision Levels			
		Strategic	Tactic	Operational	
General Features	Data-Sharing	<div></div>	<div></div>	<div></div>	
	Interoperability	<div></div>	<div></div>	<div></div>	
	User-Centric	<div></div>	<div></div>	<div></div>	
	Integration of Information	<div></div>	<div></div>	<div></div>	
	Coordination & Cooperation between mobility agents	<div></div>	<div></div>	<div></div>	
Specific Features	C1 – Transport Services	C1.1	<div></div>	<div></div>	<div></div>
		C1.2	<div></div>	<div></div>	<div></div>
		C1.3	<div></div>	<div></div>	<div></div>
		C1.4	<div></div>	<div></div>	<div></div>
	C2 - Information	C2.1	<div></div>	<div></div>	<div></div>
		C2.2	<div></div>	<div></div>	<div></div>
		C2.3	<div></div>	<div></div>	<div></div>
		C2.4	<div></div>	<div></div>	<div></div>
		C2.5	<div></div>	<div></div>	<div></div>
		C2.6	<div></div>	<div></div>	<div></div>
	C3 - Payment	C3.1	<div></div>	<div></div>	<div></div>
		C3.2	<div></div>	<div></div>	<div></div>
		C3.3	<div></div>	<div></div>	<div></div>
		C3.4	<div></div>	<div></div>	<div></div>
		C3.5	<div></div>	<div></div>	<div></div>
		C3.6	<div></div>	<div></div>	<div></div>

Required

Optional

Absent

By each general & specific Features

which type of policy instruments best fit

within each level of decision & indicative stakeholder

S T



Features	Policy Instruments (by governing resource and purpose of tool)		Levels of Decision and indicative group of Stakeholders	
			Strategic	Tactic
<ul style="list-style-type: none"><li>• Data-Sharing</li><li>• Interoperability</li><li>• C2.1 Static Multimodal Journey Planner ("Static" data)</li><li>• C2.2 Dynamic Multimodal Journey Planner ("Real-time" data)</li><li>• C3.1 Pay-as-you-go (PAYG) (physical only)</li><li>• C3.2 Pay-as-you-go (PAYG) (electronic)</li></ul>	Auth. (subst.)	Direct Government Regulation [1]: <i>Laws, independent regulatory commissions.</i>	Political authorities	Technical authorities and agencies Regulating authorities
		Market Creation and Maintenance tools [2]: <i>establishing of limits and permits</i>	Political authorities	Technical authorities and agencies Regulating authorities
		Visions and strategies: <i>Policy Vision, Strategic options and plans [6]</i>	Political Authorities	
	Org. (subst.)	Direct Government [3]: <i>Line departments, central support agencies</i>	Political authorities	Technical authorities and agencies
	Org. (proc.)	Network management tools: <i>Creating or reorganizing government agencies [4], Legislative and executive oversight agencies [5]</i>	Political Authorities	Technical authorities and agencies Regulating authorities

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(...)

(...)

(...)



## 5. Conclusions

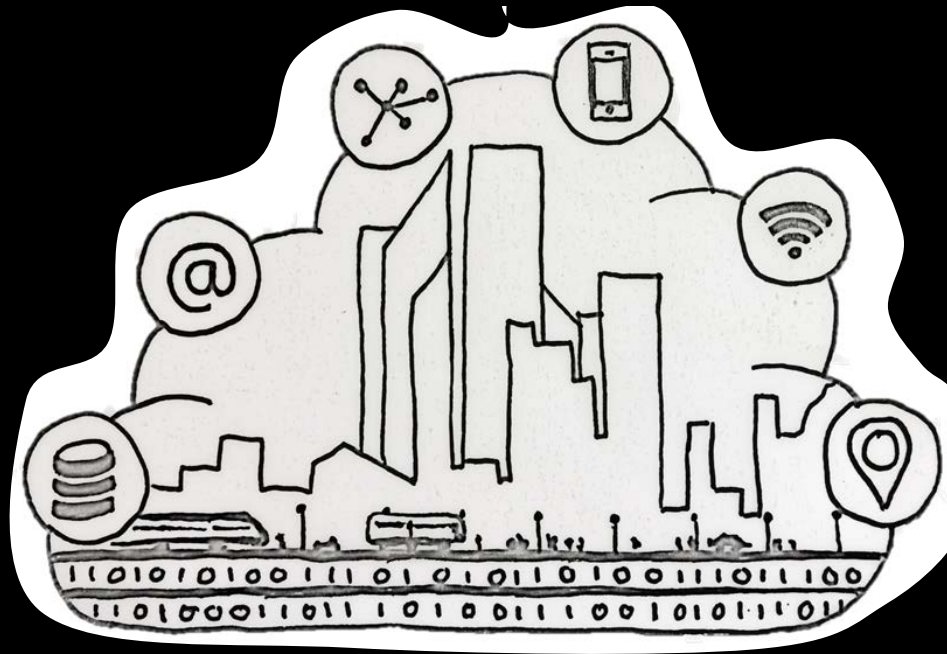
A structure for “MaaS concept” and a “Public Policy Framework” supporting its implementation was proposed

### Common challenges & barriers:

- ▶ Non-availability of Open Data, that allow data-sharing
- ▶ Lack of standardization and “interoperability” of Data
- ▶ Lack of cooperation between mobility agents
- ▶ Access to “Sales and Tickets interfaces”
- ▶ “Privacy” of data & “Data security”
- ▶ Subsidy not only for PT but also first/last mile MaaS (?)

### “MaaS” as a Mobility Management Tool

- \_has higher potential in **Monitoring** capabilities
- \_has the possibility to increase the **efficiency of the transport system**
- \_can play an active role in the promotion of **sustainable mobility goals**
- \_can be a **game changer in the role of public transport**



MaaS is not only about technology!

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