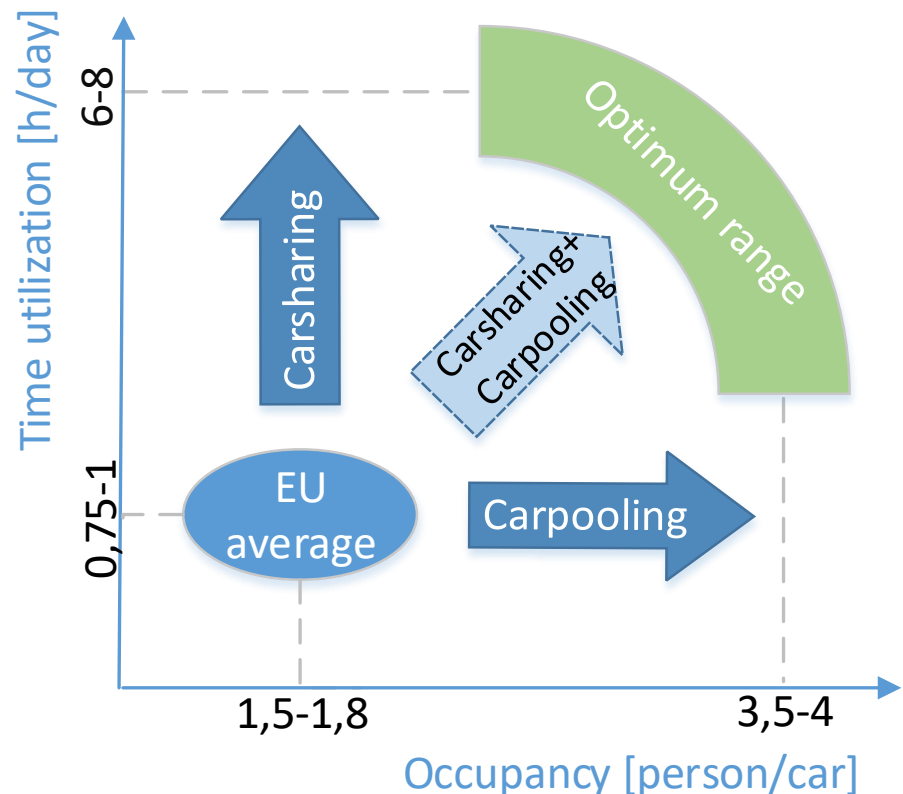


Characteristics of operation of car-sharing systems

1. Introduction
2. General features of car-sharing
3. Structure and operation of the telematics system
4. Further development, outlook

The availability is more important than the ownership

shared parking



1. Introduction

Open workshop – expensive tools

Aim:

- Creating whole mobility chains,
- Partial replacement of the individual car usage,
- Reduction in the downtime and in the total cost per distance unit of the public cars,
- Reduction in the number of the owned passenger cars,
- Reduction in the number of the necessary parking places,
- Reduction of the environmental impacts.

Key to the success: critical mass; trust




business-like service

Automated information management system and operation

1 car sharing car: ~35 user, ~8 private cars are replaced:

shedding effect (sell the car) + suppression effect (do not buy an additional car)

Car sharing history

1948		1980		2000	
cost efficiency		environment		telematics	
<ul style="list-style-type: none">• first car sharing community: Switzerland (1948) main reason: cars were expensive• model: people shared their own cars with others – peer-to-peer round trip• operated for 50 years• model for French, Dutch, Swedish car-sharing communities		<ul style="list-style-type: none">• environmental consciousness• university studies and project on car-sharing – how to develop the model• experimental projects started on how to evolve the round-trip model – station-based model appeared		<ul style="list-style-type: none">• rapid development in IT – remote management of cars• university projects laid the foundation of free floating model• several car manufacturers and rental companies have free-floating cars-sharing services	

source: Bálint Michaletzky: *Car Sharing – history and present in Budapest*, presentation, Greengo, 2017.03.20

2. General features of the car-sharing system

aim: increasing in the running time of the vehicles

Development of the service

Operational features

- using different forms of mobility in a combined way
- diverse/various vehicle fleet (eco-friendly)
- handling of the accident (automatic alert, e-call)
- fuelling
- return of the vehicle (to the same parking place) round trip, one way
- **the basic process and the information management operations mustn't be manipulated**
- maintenance (planned or not planned), cleaning operations
- evaluation of and by the traveller
- what is the scope of the **responsibility** (insurance)

Operating companies:

1. private companies,
2. new local public service companies,
3. after profile expansion of any existing transport service companies (e.g.: railway company)

p2p [peer-to-peer carsharing](#) (car club)

Fee payment features

the amount of the fee/rate is influenced by:

- type of the operation
(business-like or non-profit operation according to community principles),
- features of the vehicle fleet,
- features of the car sharing parking area/lots (pl. location),
- additional services,
- partner programs (cooperation with other service providers), etc.

Usage-dependent charges

Usage-independent charges

Additional charge, surcharge

Automatic payment

use of **public** cars, at **different time periods** by unknown people

aim: decreasing of cost outgoings, increasing individual feature

more efficient in case of shorter distances

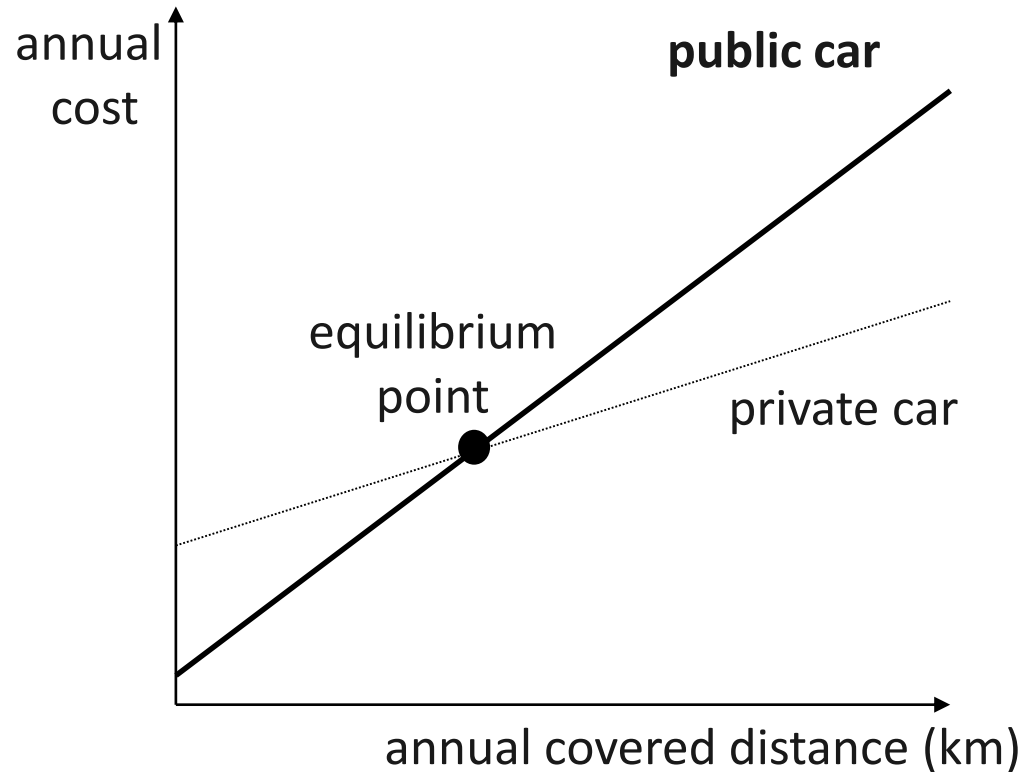
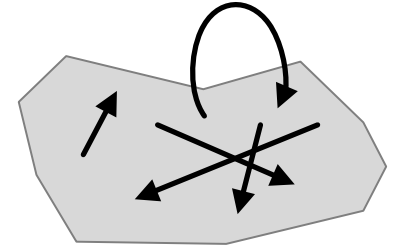
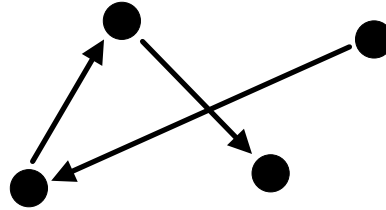


Diagram of costs of public car and private car

Impact on the environment

Comparison of models

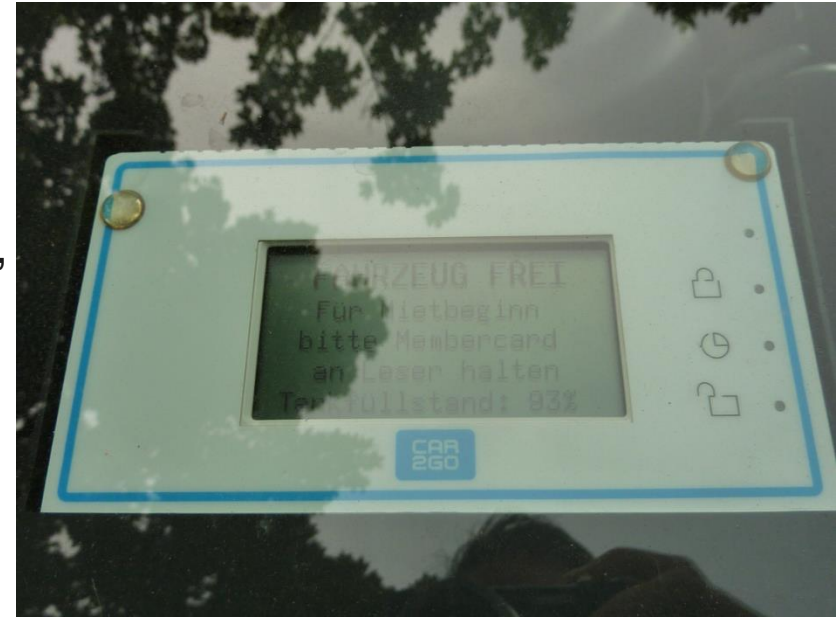


model	round trip	station-based	free floating
pick-off drop-off	at any station or at owner of vehicle vehicle has to be returned to the original spot	vehicle picked up and returned to any given station in the network	pick-up and drop-off are not limited to specific points but a large area
car owner	privately (peer-to-peer) or service provider	privately (peer-to-peer) or service provider	service provider
fleet	diverse flett	homogenous or diverse	homogenous
pros	peer-to-peer version demands low investment low fleet management cost availability of cars are guaranteed charging of electric vehicles is simple	diverse fleet can meet different needs private cars and trips can be replaced around a station availability of cars are guaranteed charging of electric vehicles is simple	flexible private cars and trips can be replaced (walking distance is reduced) averting needs to public transportation
cons	inflexible usage and availability is geographically limited	inflexible usage and availability is geographically limited	regulatory and municipality cooperation are required on parking availability in walking distance is not guaranteed (but operators try to distribute vehicles according to demands) charging of electric vehicles requires additional activities and runs

Characteristic of information management of car-sharing systems

Telematics background

- GIS databases
(development of database management),
 - positioning/tracking of passengers and vehicles,
 - high-speed and high-capacity wireless data transmission
 - Internet, WAP service,
 - navigation systems,
 - personal identification systems and procedures.
-
- cooperation with other passenger transportation modes
 - choice between substitutable modes (according to complex system of aspects),
 - travel chain planning;
 - aiding operational management (transfers)

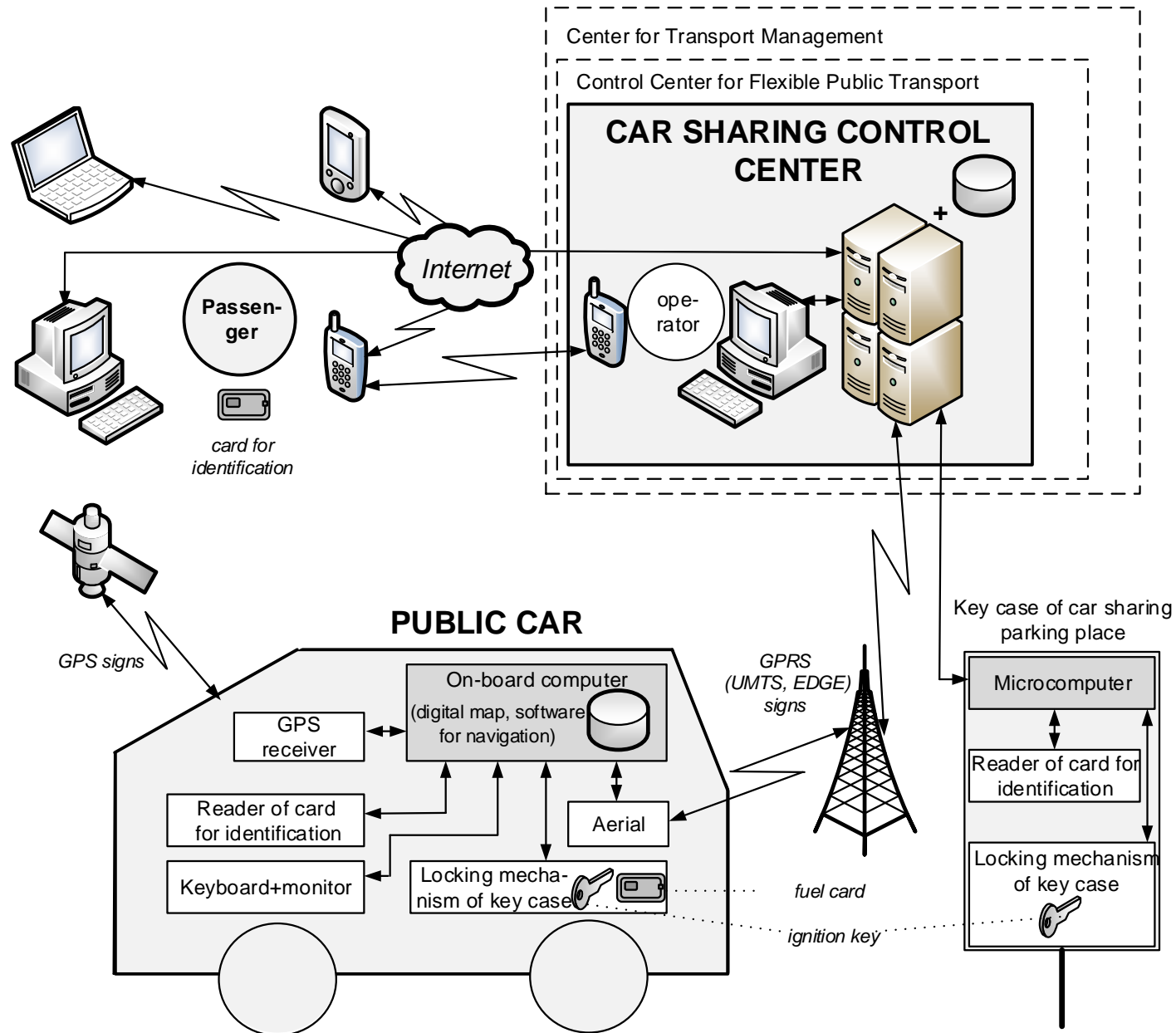


Detailed comparison of the car sharing and car rental systems

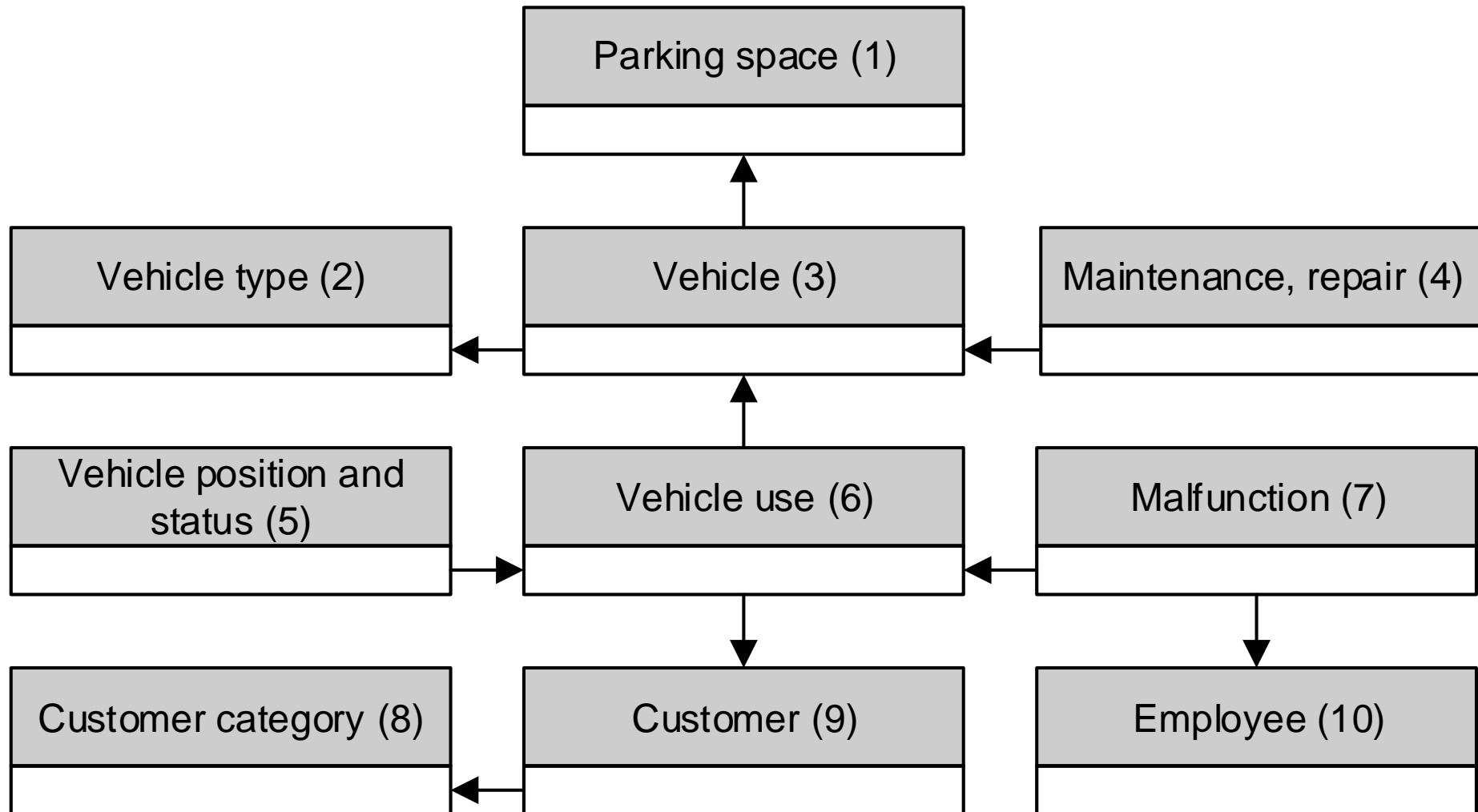
	Car sharing	Car rental
Targeted public	Mainly local residents	Tourists, businessmen
Users/Beneficiaries	Only registered members (membership)	Open service
Pick up location	At the designated parking areas; several place throughout the city, usually at public transport hubs	Usually at airport and some place in the city
Drop-off location	Just in the own parking place (usually at the place of takeover)	By prior arrangement anywhere (for extra fee)
Temporal availability	non-stop	In opening hours (can be non-stop)
Type of the service	Self-service	Company staff is necessary
Minimal usage time	1 hour	1 day
Duration of use	Usually some hours	Some days
Fuel price	Included in the renting fee	Not included in the renting fee
Insurance fee	Mandatory liability insurance is included in the renting fee	
Development, maintenance, repair fee	Included in the renting fee	
Type of operation	Can be profit-oriented and non-profit oriented	Profit-oriented

3. Structure and functions/operations of the telematics systems

Structural model

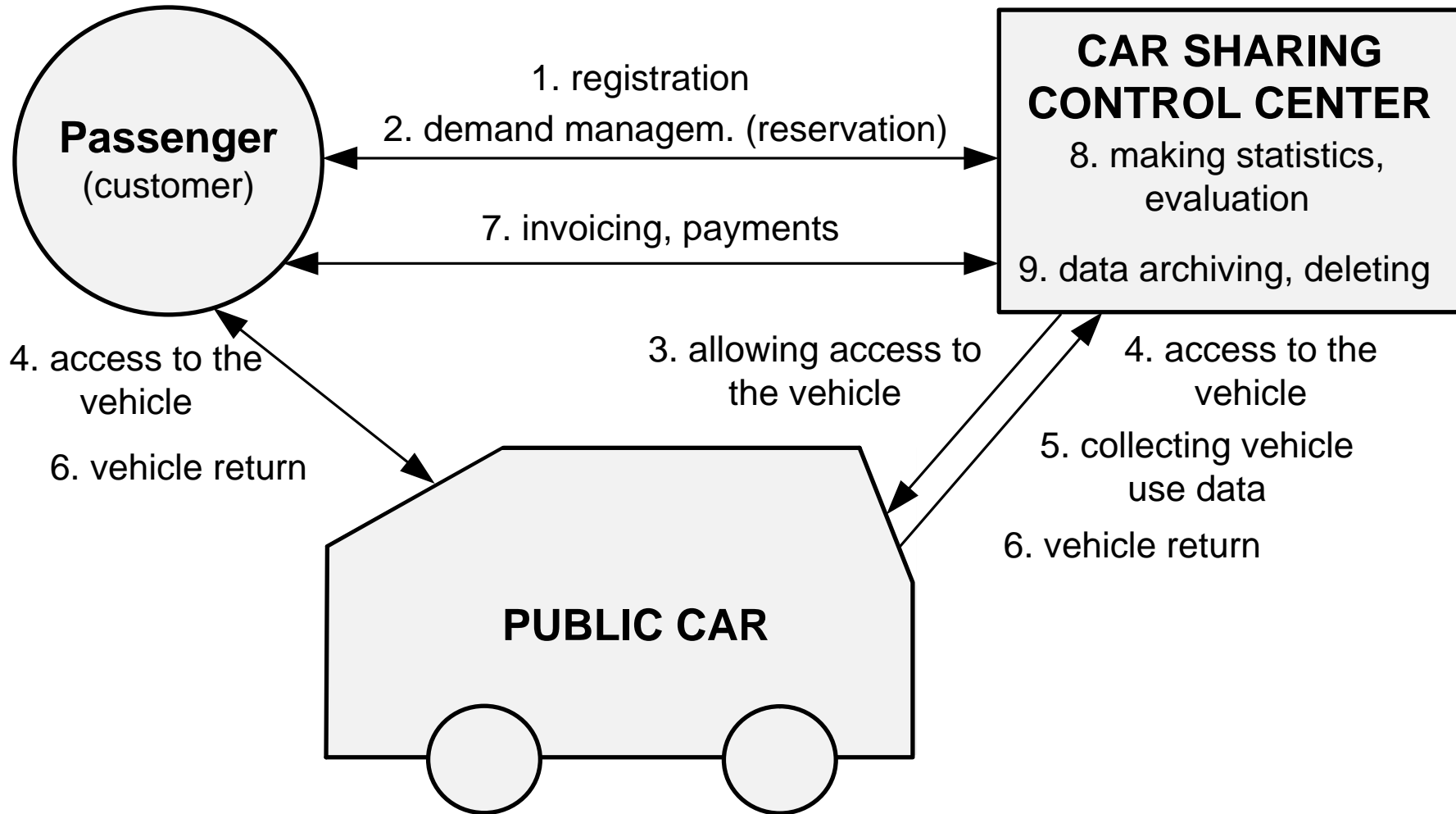


Structure of the central database



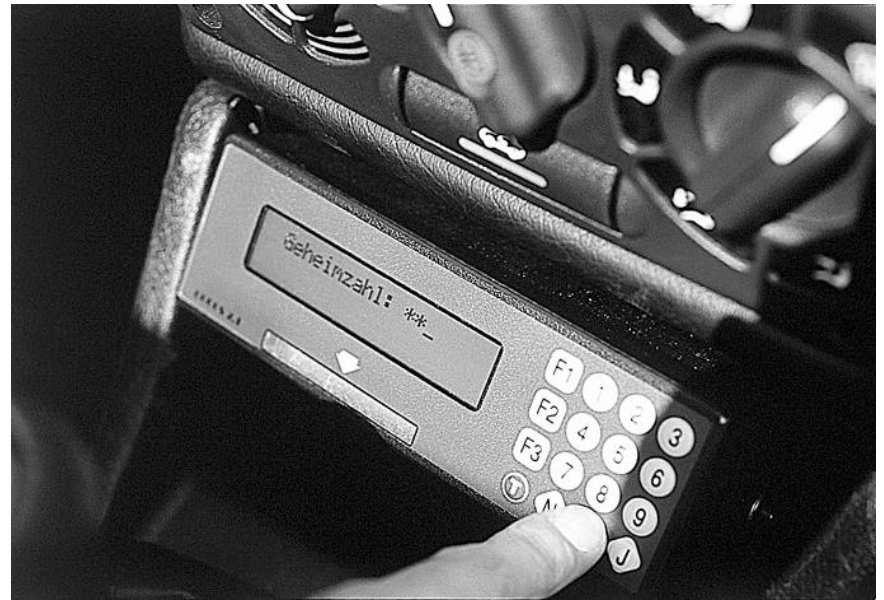
- Dynamic data, mainly automatic data input.
- Static and half dynamic data, mainly manual data input.

Functional model





Using Client ID Card



Using PIN code

4. Further development, outlook

- automatic positioning of the passenger
- different starting and finishing parking place + free flow solutions
- rating of the customers
- integration of dispatch/control systems of different DRT systems/modes
(*multimodal mobility organizer*)
- ride sharing
- (moto)bike sharing

Missing link

- appropriate availability,
- integration with the other mobility services
(*especially with the public transportation*),
- rising awareness, marketing campaigns
(*e.g.: advertising on buses and transit stations*).

the total share in the passenger transport is low

uniform procedures and technology

telematics integration

<http://www.getaround.com/>

<https://beerides.com/hu>