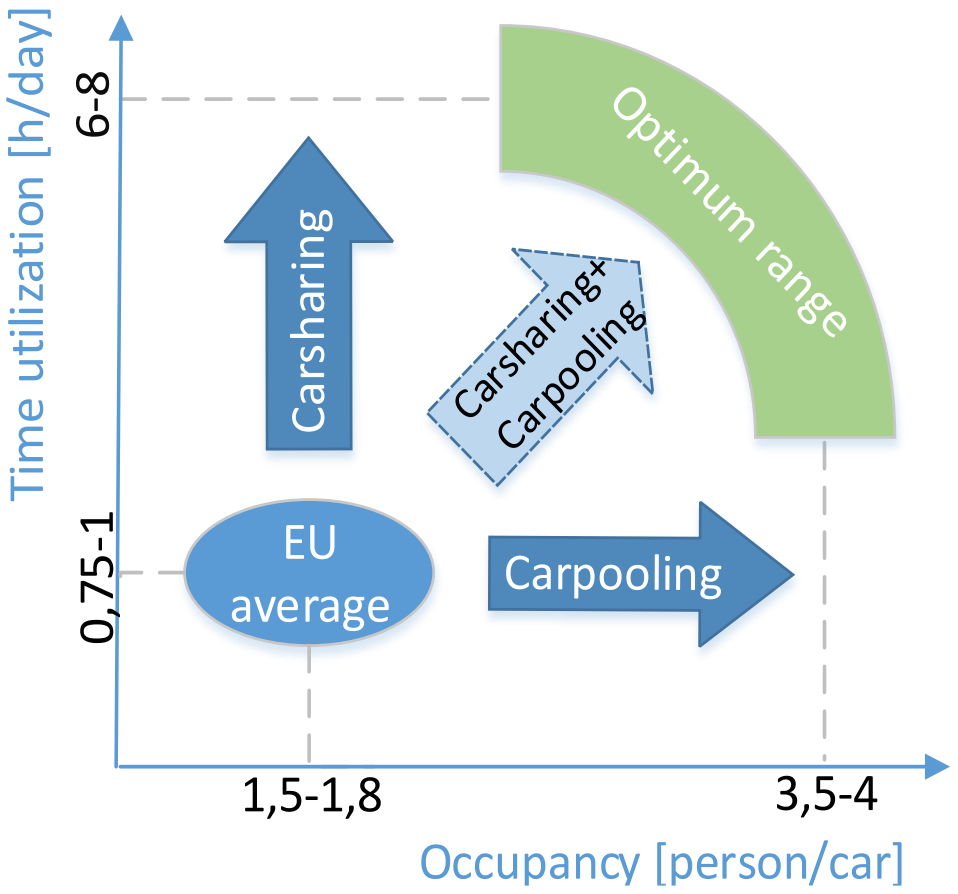
Car pooling systems

1. Introduction
2. General features of carpooling
3. Transportation process
4. Information Management Process
5. „Oszkár” system
6. Further developments



Daily trips in Hungary ~1000

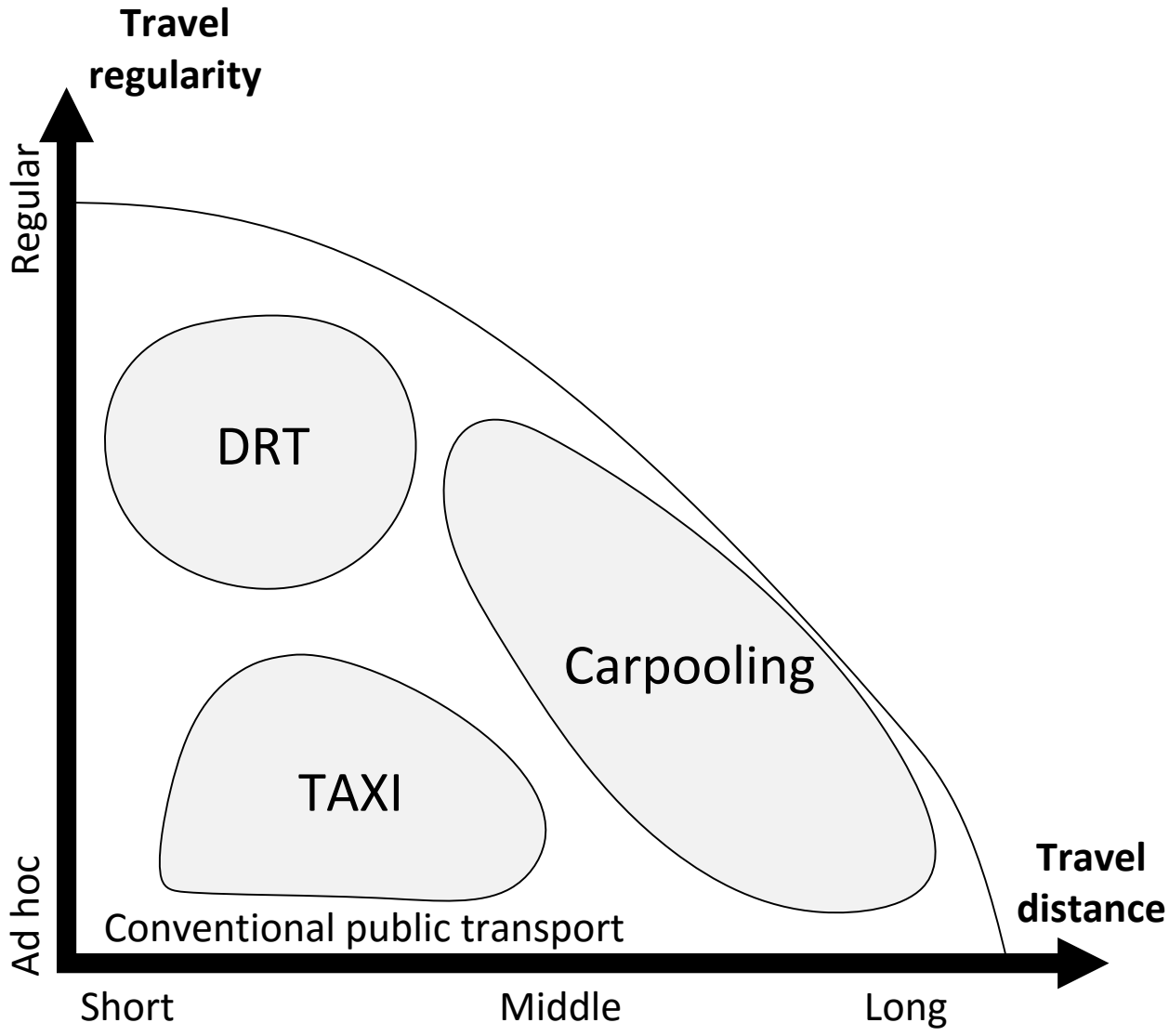
Waze - Carpool (2)

1. Introduction

- car pool,
- telecar, **teletaxi**
- non-business-like
- trust
- reducing time and cost
- public transport can be replaced, supplemented
- insert the carpooling system into the passenger transport system
- UBER, WunderCar

2. General features of carpooling

- stages of development
- the activities and features of participants
- payment (stand of Hungarian Tax Authority)
- impact on the environment
- telematics background
- degree of regulation? designation of arrival and departure points – *in case of significant traffic*
- marketing - *carpooling applications on municipal webpages*



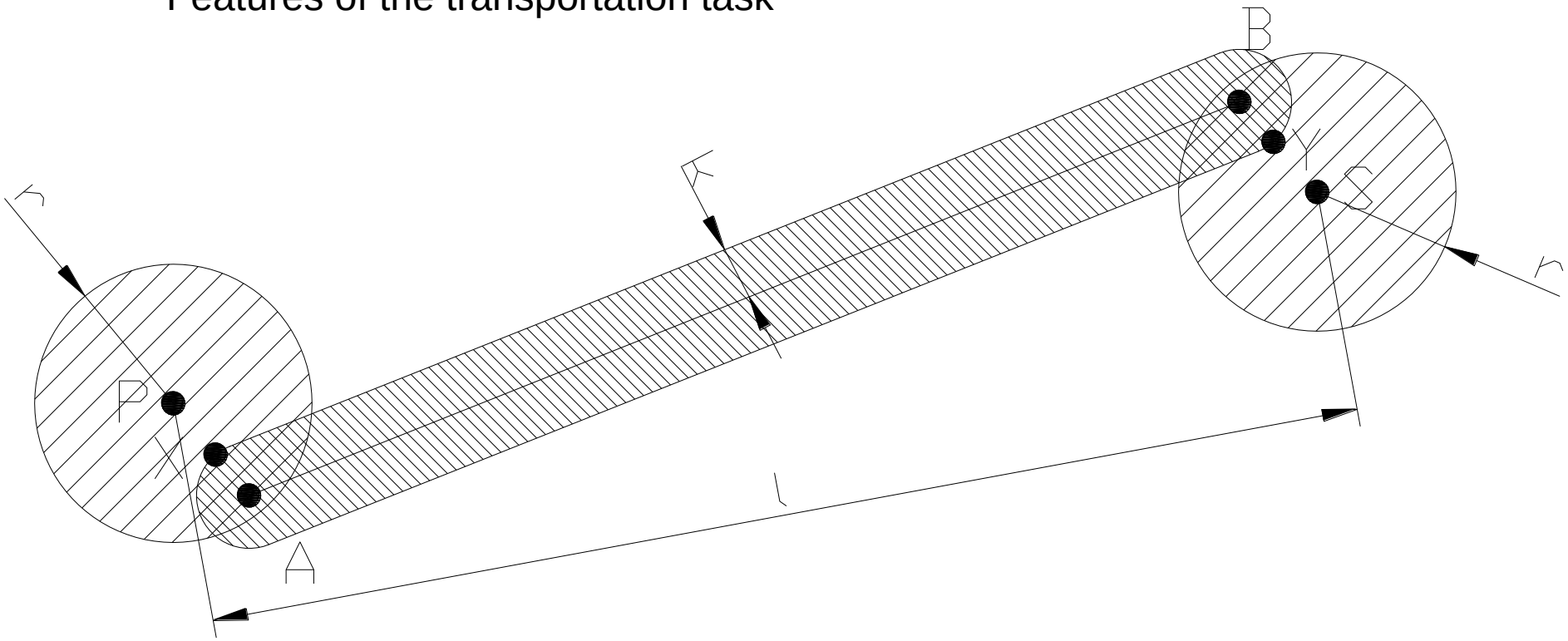
Comparison of public transport with car-pooling according to distance and regularity

Flexibility features	conventional public transport	demand responsive transport (DRT)	taxi	carpooling
Spatiality – location of boarding and alighting	at designated stops	at designated (conditional) stops or anywhere	anywhere	anywhere (agreed by the parties)
Spatiality – bound or unbound routes	on bound routes (lines)	partially bound or unbound	unbound	unbound
Temporality (schedule)	according to timetable	just the departure time at important stops are fixed or no timetable	no timetable	anytime (agreed by the parties)
Users	anyone	registered persons	anyone	registered persons
Pre-ordering	no	necessary	in most cases necessary	necessary
Charge/fee	fixed	fixed	fixed	according to the agreement

Comparison of public transport modes with car-pooling according to flexibility features

3. Transportation process

Features of the transportation task

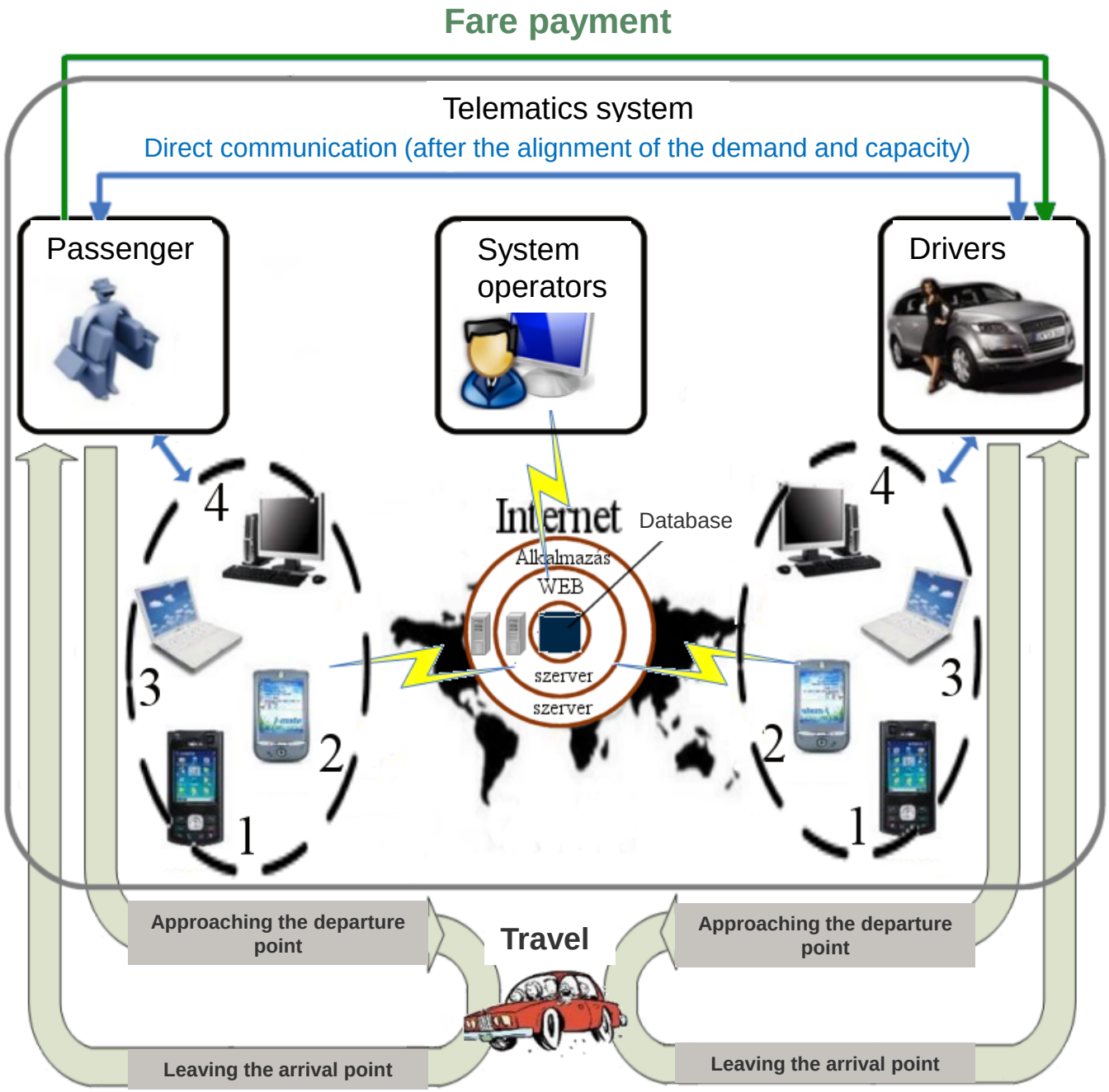


Spatial conditions of common travel

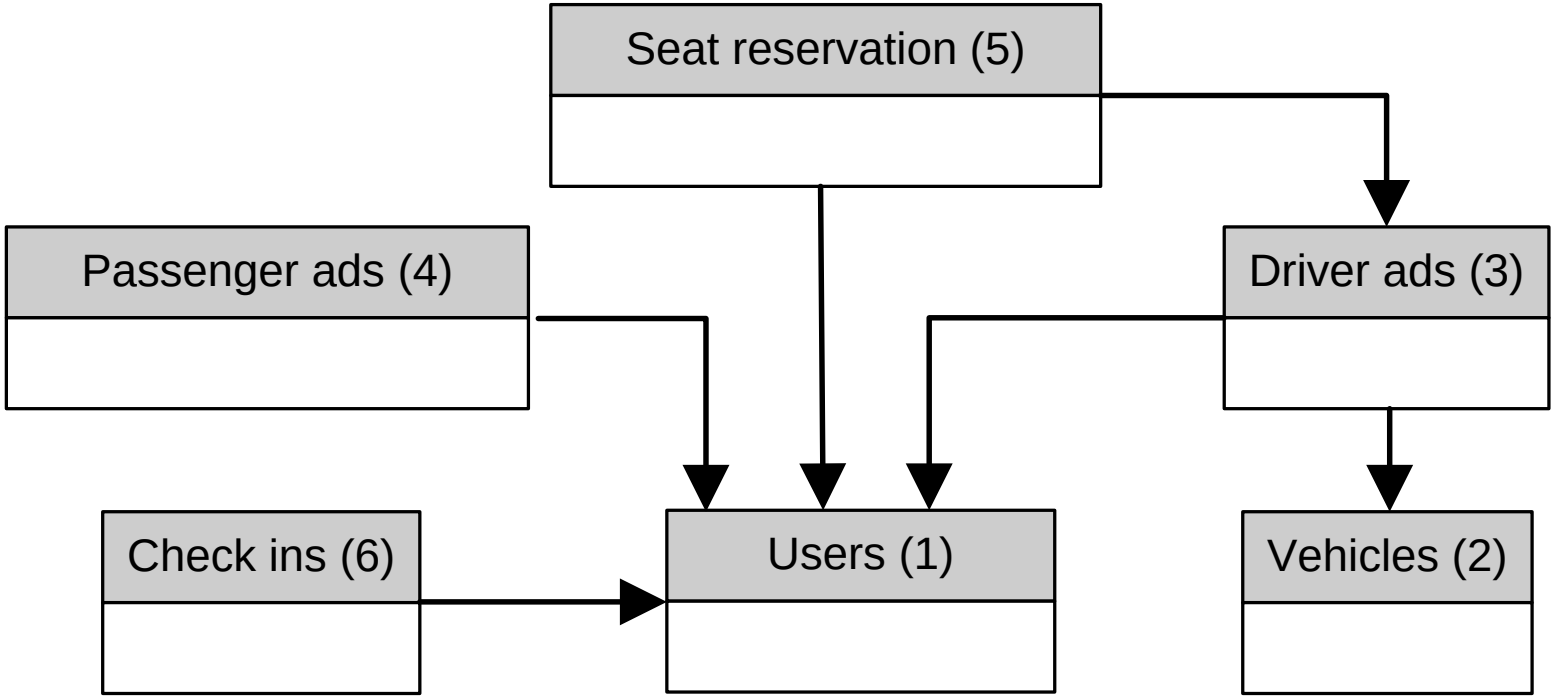
Preparation and execution of travel

4. Information Management Process

Structure of the telematics system

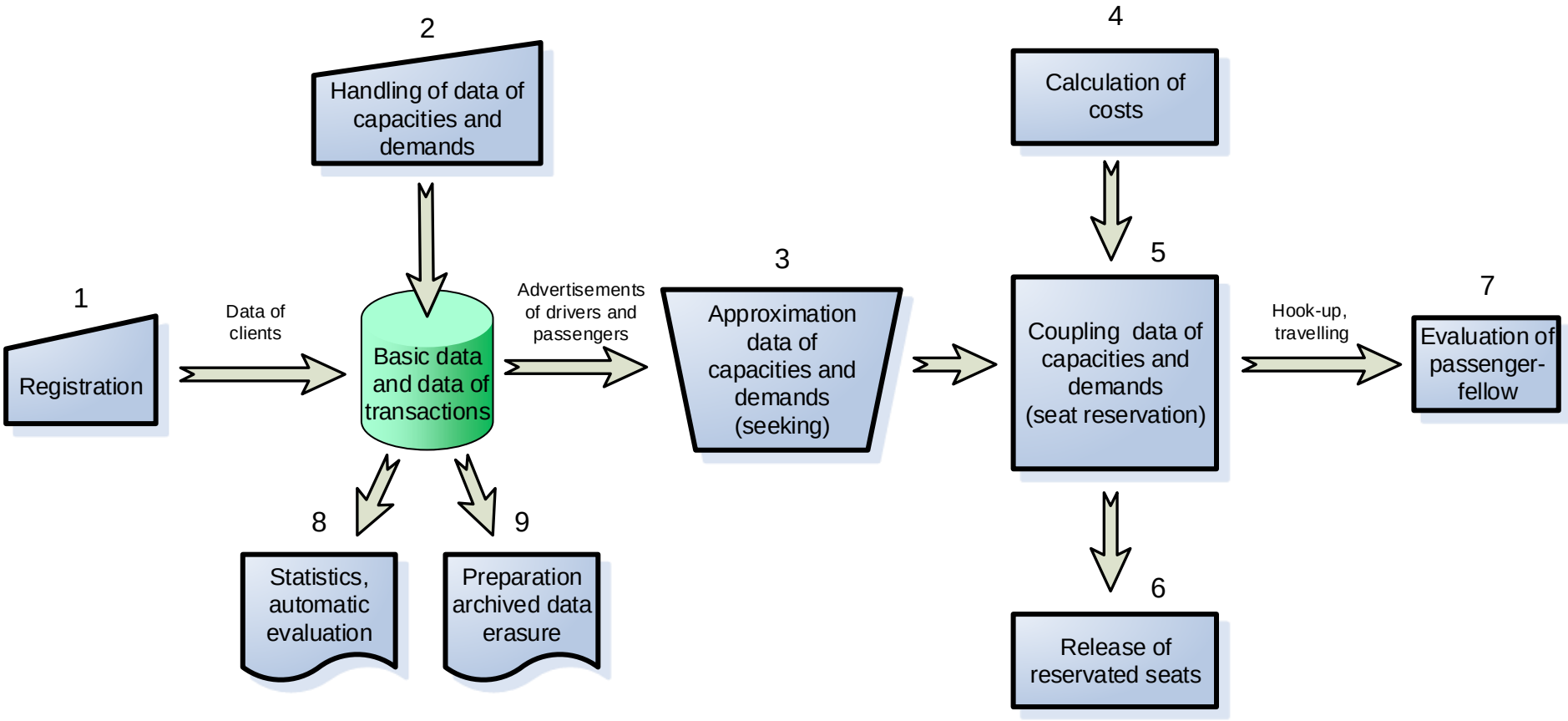


Structure of the database



- Information management operations of drivers
- Information management operations of passengers
- Information management operations of the telematics operators
- Data security

Operation of the telematics system



Operational flow chart of car pooling

5. „Oszkár” system

Delineations

Program features

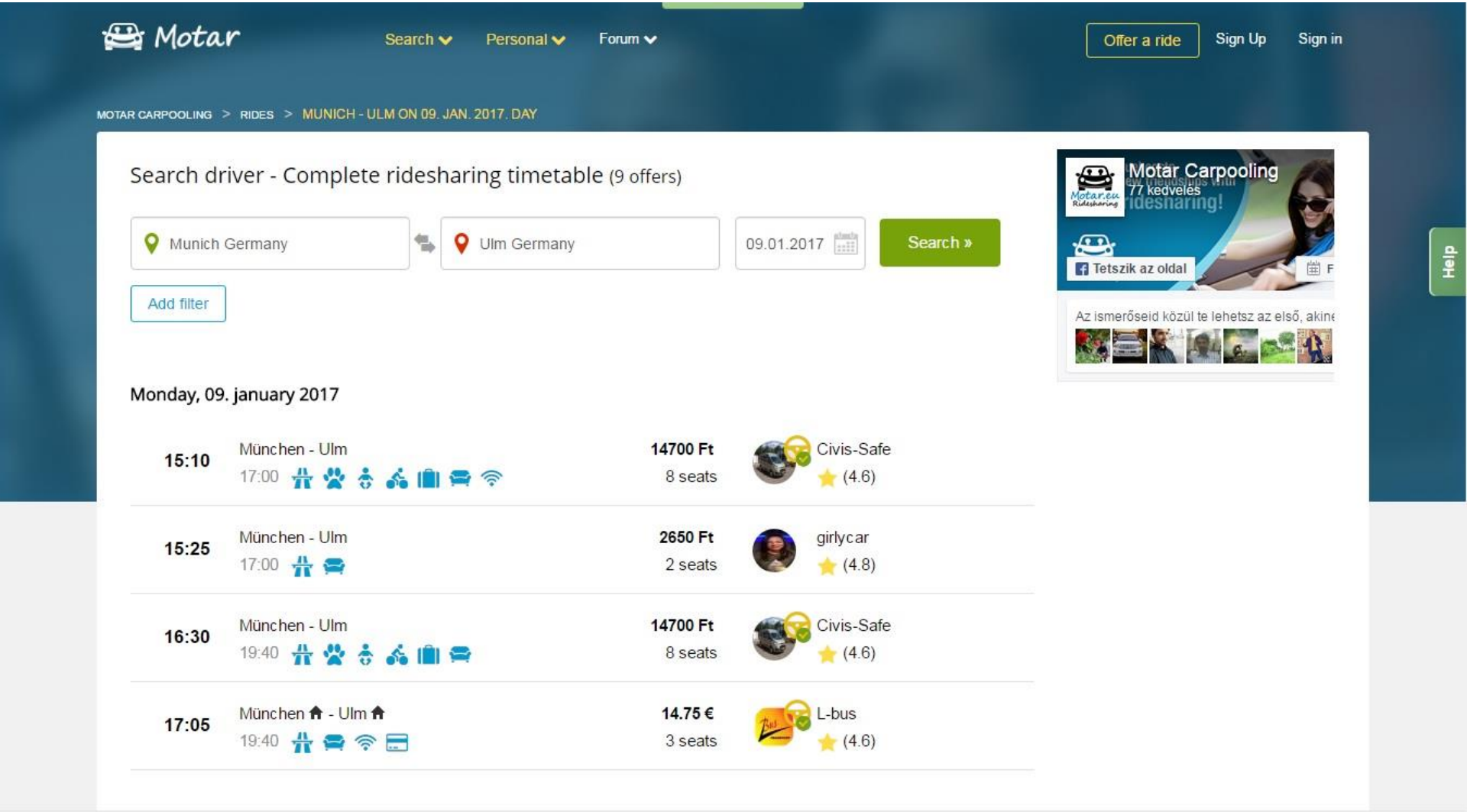
Operational experiences

www.oszkar.com

		kenguru.hu	elviszem.com	drive2day.com	utazzolcson.net
	Free	***no***	yes	yes	yes
Privacy / reliability	Registration is required	yes	yes	yes	yes
	Data can be seen without registration	no	***yes***	***yes***	no
	Profile picture	***no profile***	no	yes	yes
	Evaluation possibility	automatic	***no***	yes	professional
Functionality	Seat reservation	yes	***no***	***no***	***no***
	Suitable for domestic travels	***limited***	yes	***no***	yes
	Part way is possible	yes	yes	yes	yes
Supplementary functions	Save the vehicles	***no***	one	***no***	***no***
	Save the travels	***no***	***no***	***no***	***no***
	Regular trips	***no***	yes	yes	yes
	Cost calculator	mandatory	***no***	incorrect	simple

Comparison of carpool systems

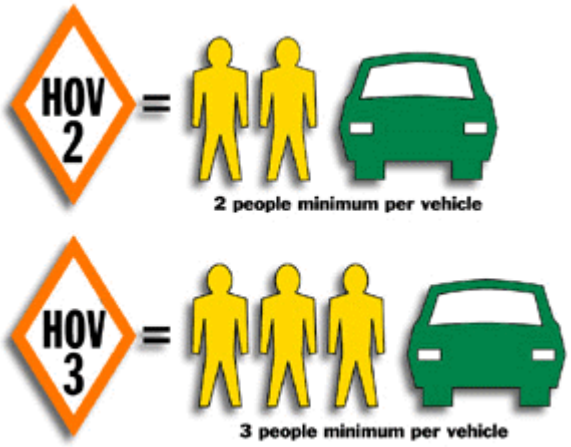
Screen of the result list



CarPool lane

Alternative names of the 2+ lanes:

- HOV lane
- carpool lane
- diamond lane
- transit lane T2 or T3 lane




CARPOOLS
2 OR MORE
ONLY
ONLY
POOL

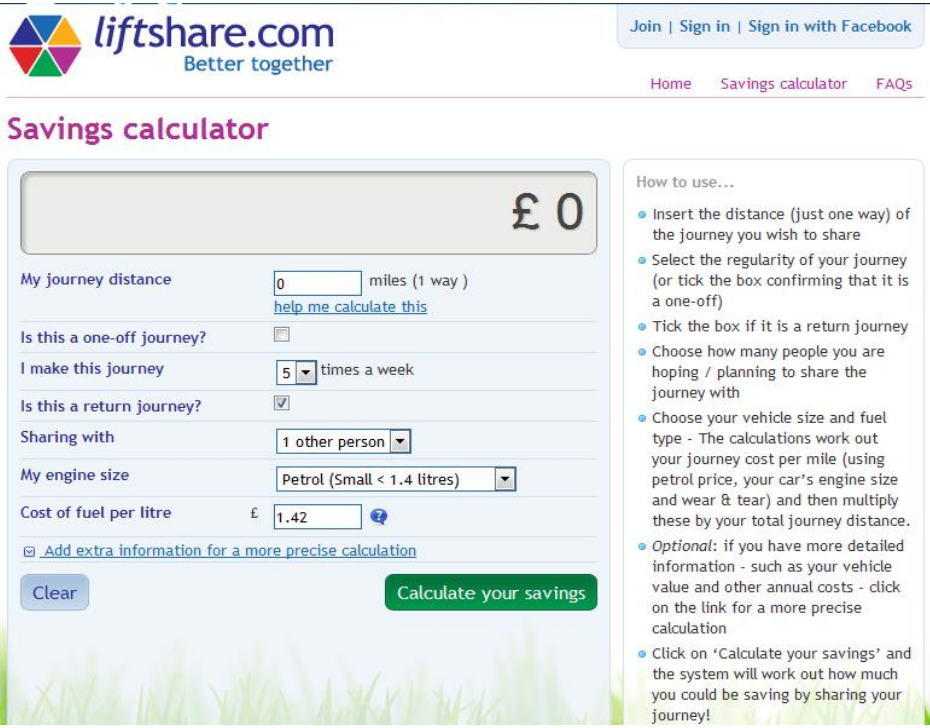

HOV 2+ ONLY
2 OR MORE
PERSONS
PER VEHICLE


HOV LANE
BUSES & HOV 2+ ONLY
3 PM-7 PM
MON-FRI
BUSES ONLY OTHER TIMES

- oszkar.hu
- utazzunkegyutt.hu
- utazas.com

- telekocsi.eu
- carpooling.com
- carpoolworld.com
- lifepool.com

https://www.liftshare.com/content/savings_calculator.asp



VanPool

	Driver	Vehicle Ownership	Vehicle Size
Conventional Public Transit	Paid	Public	Large
Paratransit	Paid	Public	Medium
Vanpool	***Unpaid***	***Group Rental***	***Medium***
Carpool	Unpaid	Personal	Small
Taxi	Paid	Business	Small

source: Victoria Transport Policy Institute Ridesharing. Victoria, Kanada
URL: http://www.vtpi.org/tdm/tdm34.htm

6. Further developments

- Automatic capacity-ads
- Information via SMS, app
- Automatic positioning of passenger
- Estimation of expected arrival time
- Electronic payment by mobile phone
- Package delivery

Waze carpool (2)

Introducing Uber Movement (3)

Chauffeur services

aided by telematics

1. Introduction
2. General features of chauffeur service
3. Travel processes
4. Information management functions
5. Structure and function of the proposed telematics system
6. Outlook

1. Introduction

- In own car as passenger
- Dynamic travel and chauffeur coordination problem
- Similar to the taxi service
- Business-like service
- Travels and drivers are assigned to each other – TELEMATICS

2. General features of chauffeur services

a., spatial features

city trips – from anywhere to anywhere

b., temporal features

evening and night hours – availability time – service time

type and volume of demand – acc. 400-500 daily tasks in Budapest

c., other features

traffic safety,

motivation of the trips,

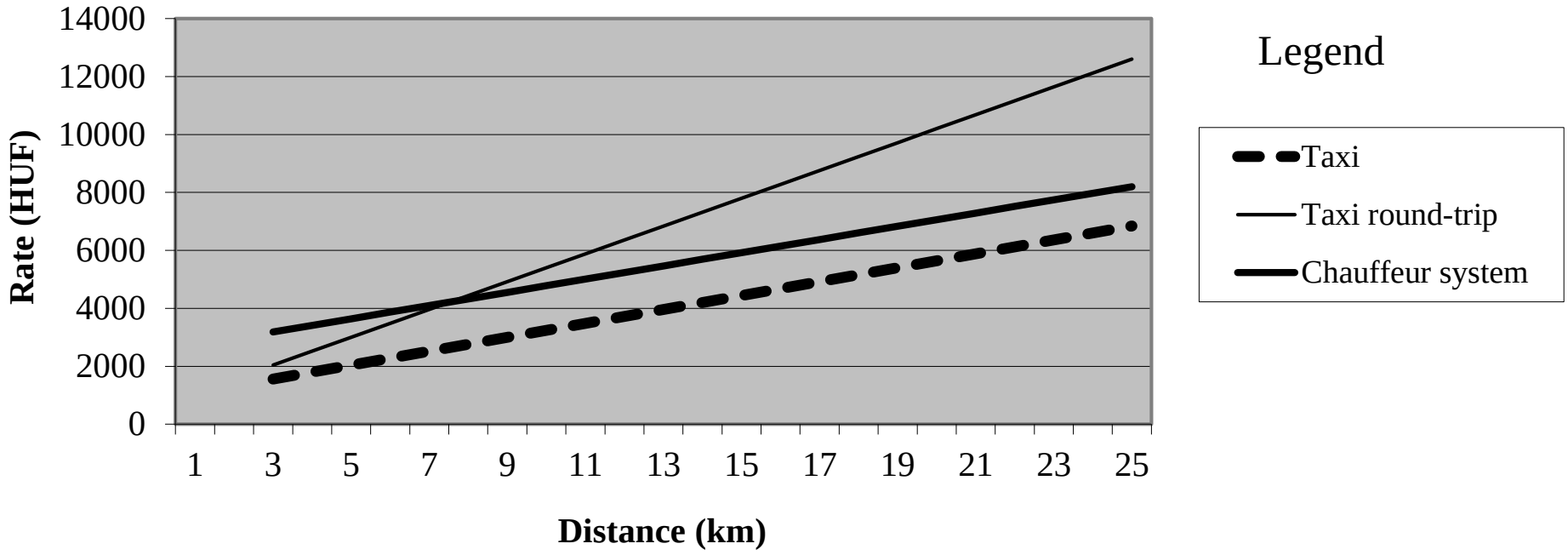
uniform,

perception/evaluation of the service

d., payment

payment – fee calculation (fix tariff, proportional to the distance, waiting charge)

above 8km distance the chauffeur service is cheaper than the taxi



Comparison of chauffeur service and taxi rates according to distance

e., flexibility features

Flexibility features / **Type of service**		Taxi	Chauffeur services
spatiality	Start and end point of the travel	anywhere	anywhere
	Travel distance	typically for short- and middle-distance	typically for middle-distance
	Bound or unbound routes	unbound	unbound
temporality	**Operating hours**	non-stop	usually in the evening and night time
	Service time	short (app. 5-15 mins)	medium (app. 20-40 mins)
users		anyone	anyone (with own vehicle)
ordering		in advance or currently	in advance or currently
popularity rate		many users – many vehicle	fewer users – fewer vehicle
rate		fixed	fixed

Comparison of taxi and car-pooling according to flexibility features

comfort

3. Travel processes

(base) driver, (base) vehicle, collection and distribution form

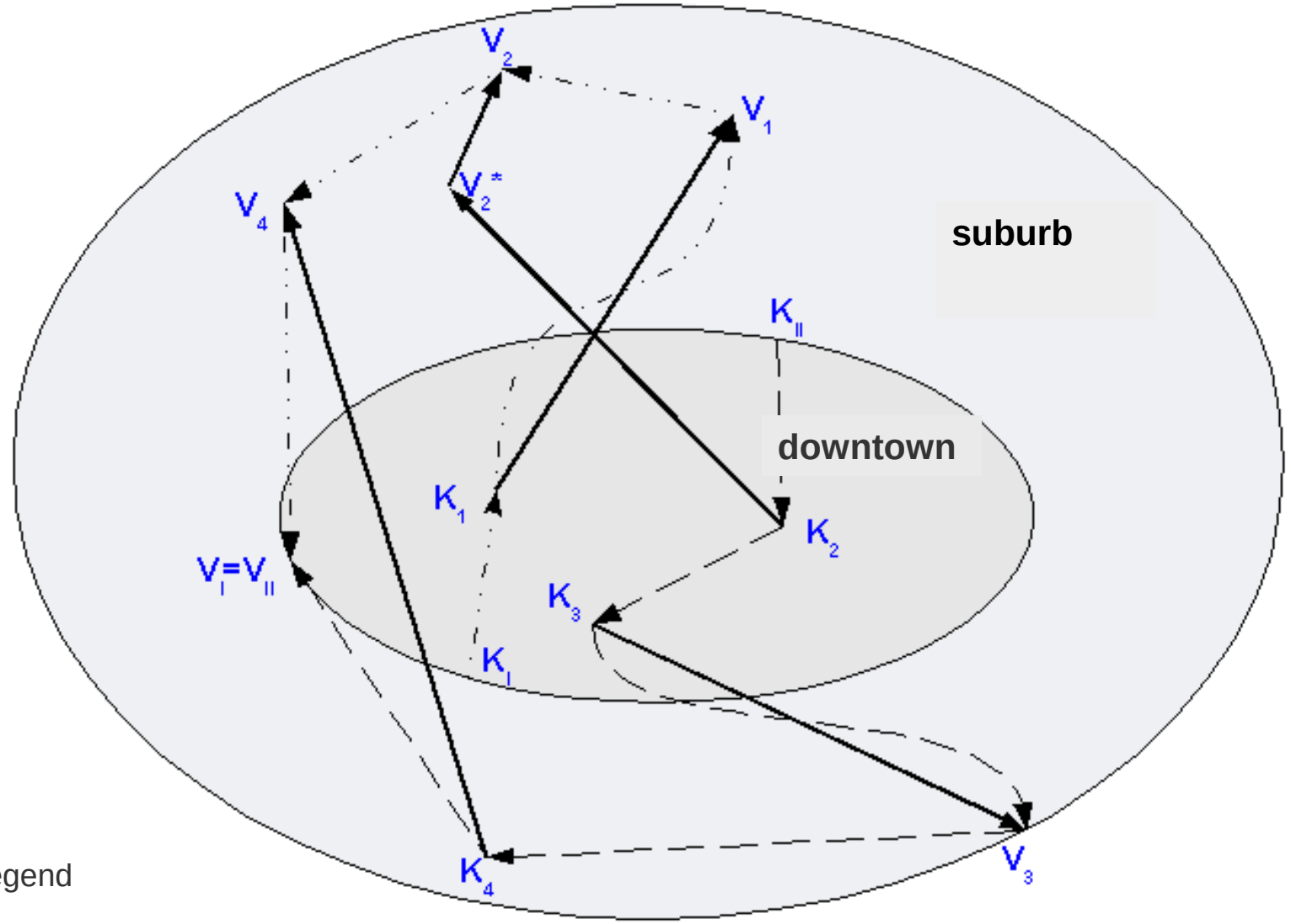
a., driver’s conveyance to the starting point

b., travel from the starting point to the destination point

incidents

c., driver’s conveyance from the destination point

spatial characteristics of the travel processes through an example (examined time interval)



Legend

$K_{1\text{-}4}$: start point

$V_{1\text{-}4}$: end point

$K_{I\text{-}II}$, $V_{I\text{-}II}$: location of vehicles at the beginning and the end of the time interval

V_2^*: middle point

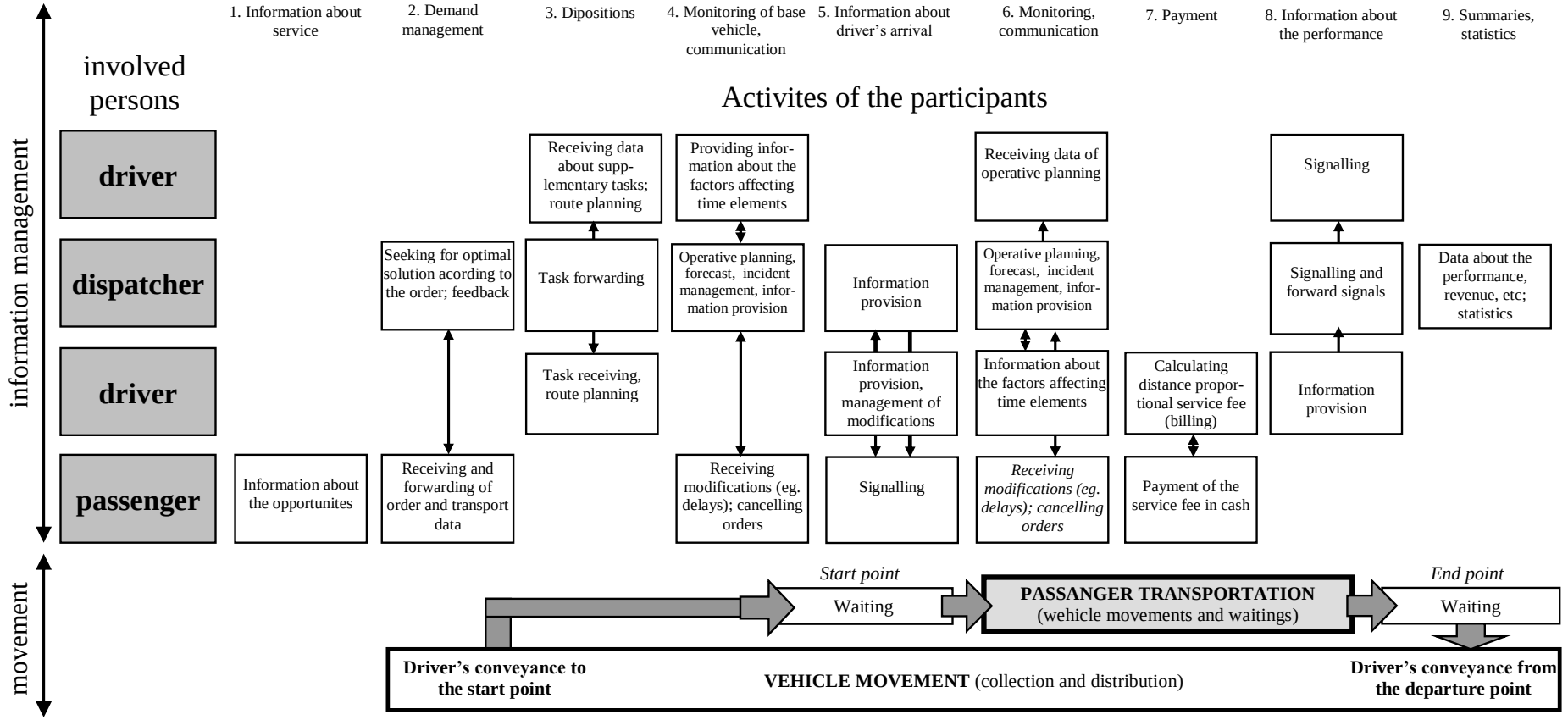
passenger transportation

movement of the car nr. 1

movement of the car nr. 2

4. Information Management Functions

currently manual information management



Basic processes and information management operations of chauffeur service

1. **Service understanding**

   sources of the information are friends, acquaintances

2. **Demand management**

   optimum searching according to several criteria: drivers are assigned to the tasks; operational planning is based on forecast of expected arrival time

3. **Dispositions**

   automatized routing

4. **Positions of the base cars are continuously monitored; communication**

   guaranteed service times, „untrustworthy” clients

5. **Information to the passenger about the arrival time**
6. **Positions of the drivers (and travels) are continuously monitored, communication**

   there is no cyclical or continuous connection

7. **Rate calculation**
8. **Information about performance of the tasks**
9. **Summaries, statistics**

5. The proposed structure and operation of the telematics system

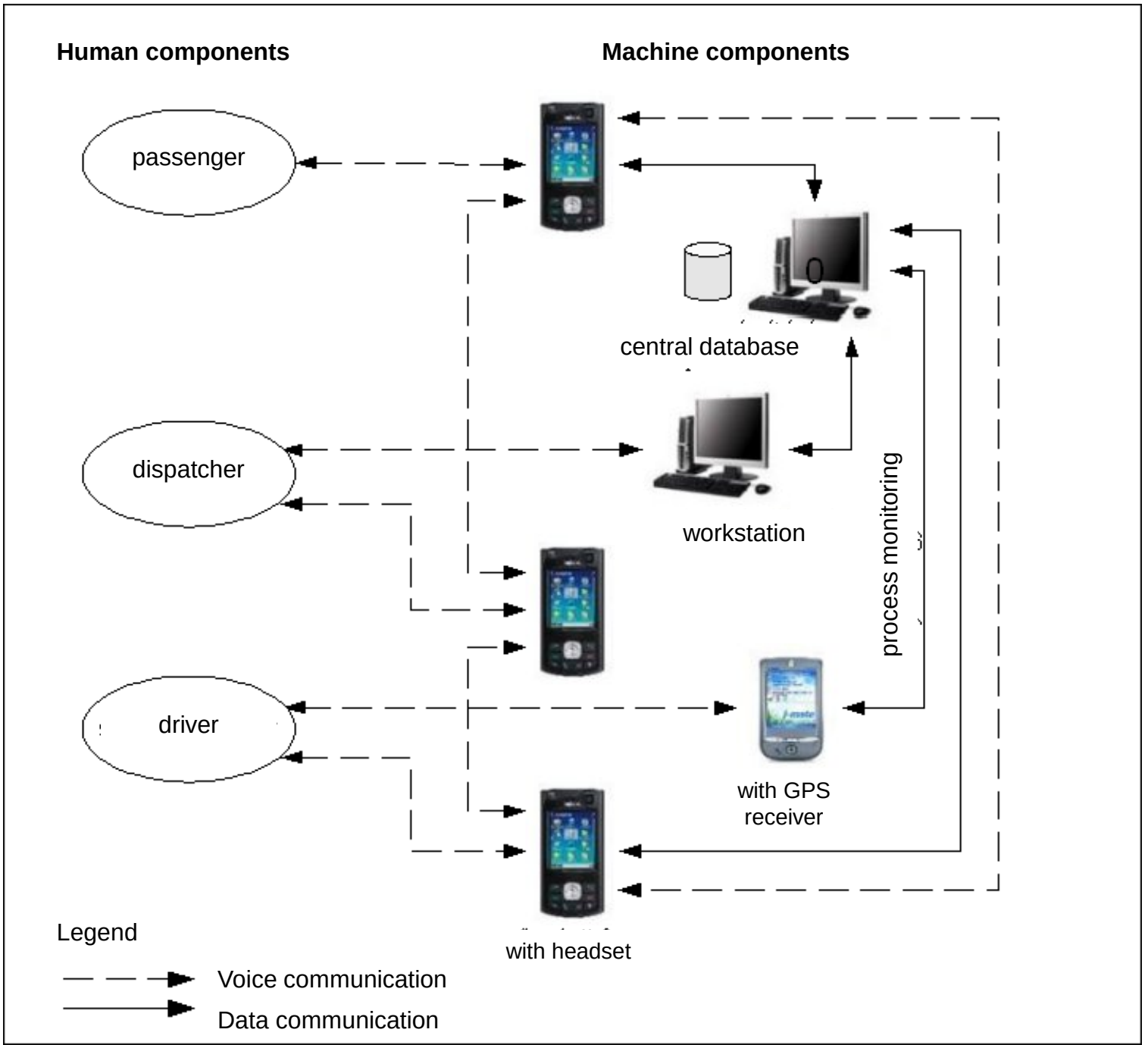
Advantages of the machine-based (automatic) information management:

- less labour demand (one dispatcher is enough for several tasks)
- fewer mistakes
- shorter organizational-time demand (especially in case of cooperation between companies)
- support for operational decisions
- optimal assigning the tasks and drivers => less time and km
- summaries according to several criteria, creating statistics in shorter time
- consequently: reduction in costs, revenue enhancement

Reduce data transfer costs

Automated information management

Structure of the telematics system



Structure of the database

1. Driver	2. User	3. User's vehicle	4. Positions of driver	9. Task
- driver ID **-** drive name - address* - language skills**	**- phone number** - name - address* - invoice address* - loyalty program?	**- VIN** *- user's phone number* - vehicle type - comment	*- task ID* *- schedule ID* - date of query/timestamp - GIS data - real?	- t*ask ID* - *VIN* - *driver ID* - *rate ID* - *departure area* - *arrival area* - *schedule ID there* - *schedule ID away* - departure address* - arrival address* - order time - service time - bypass? - estimated time of order - distance in Bp - distance outside Bp - waiting time - comment
5. Vehicle	**6. Vehicle schedule**	**7. Fixed rate**	**8. Distance proportional rate**	
- VIN - vehicle type - comment	- **schedule ID** - *driver ID* - *vehicle VIN* - **schedule** start time/date - mileage - comment	**- departure area** **- arrival area** - rate - start of validity - end of validity	**- rate_ID** **-** base tariff - km price within BP - km price outside BP - waiting charge - start of validity - end of validity	

Legend:

primary key – *foreign key*

* contains several data elements (town, district, street, number, etc.)

** can contain several data elements

Comparison of companies

	SofőrHívó soforhivo.hu	**Mars alkalmazás** marssofor.hu	**Fix sofőrszolgálat** fixsoforszolgalat.hu
Number of companies/ proposed service	several	one	one
Information	web, mobile application	web, mobile application	web
Ordering	application	application, phone call	phone call

6. Outlook

- Ordering is only voice-based. It can be recorded automatically, if e.g.: the client is identified based on his number, thereby reducing the time requirement for data record.

- With satellite-based geolocation (GPS), the incidents can be recognized according to drivers' positions; the end time of tasks can be estimated in a more precise way.

- Route-planning applications reduce the time requirements for orientation.

- With the combination of the last two functions: **navigation**
supports the orientation and reduces the surplus distances caused by mistakes (in case of both base cars and travellers' cars).

Companies employing more drivers - associations

Uber movement (3)