



# Strategic study Shared autonomous transport



# Robotaxi – Existing projects

## Ruter#

Video compilation out of Ruter presentation



<https://www.youtube.com/watch?v=-9giFJg82Js>

espaces  
mobilités

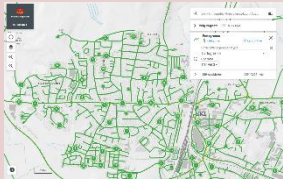



Xavier Tackoen testing robotaxi summer 22



<https://youtu.be/cfy1rn-YMRw>

# Transforming the transportation system

Ruter Norway

Initiative	Technology demonstration	Business viability demonstration	Scaling demonstration	2030 ->
Geo area	Local area 	Municipality 	Oslo Region 	Oslo – Viken 
AV's total	4 – 20	20 – 250	~ 20 000	30 000 +
Timing	2022-2024	2023-2025	2024-2030	2030-

**Ruter#**

## Research questions

How can the government guarantee that the **potential social benefits of shared autonomous driving** (in particular robotaxi and roboshuttle) on the road in Flanders are **realized** and that the possible **negative undesirable effects** of private autonomous transport are **mitigated**?

### A Scenario's & tijdslijnen

- Which **potential scenarios** in private versus shared/pooled autonomous transport will manifest themselves at different locations in Flanders without government intervention?
- Which **associated timelines** (2030 - 2040) are linked to this?

### B Rol van de overheid






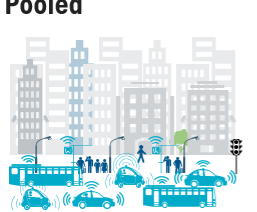

- What is the **role of the government** in this story?
- How can the potential **societal benefits** of shared autonomous driving for passenger transport be **maximised**?

### C Voorbereiding

- How can the government best **prepare** for this role?

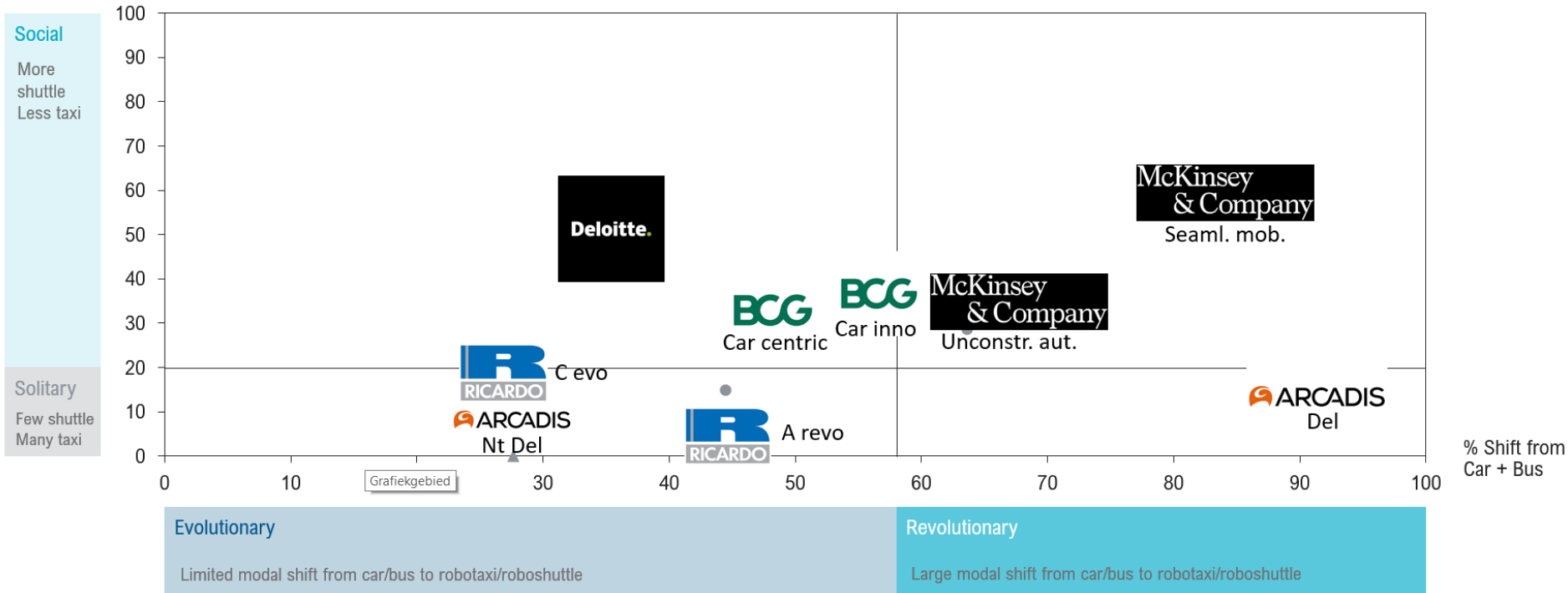
# Autonom vervoer – Business models

## Business model – Scenarios

	Description	Value proposition for customer	Vehicle type	Existing examples [not exhaustive]
<b>Private</b> 	<p>The autonomous car remains the property of 1 individual or family</p>	<p><b>Car as house extension</b>            Autonomous cars in which people can work, sleep, relax,...</p>	<p><b>Private car</b></p> 	<p>Beta testing of Tesla's Full Self-Driving (FSD) module for private cars (2022)</p> 
<b>Shared</b> 	<p>Autonomous cars are used after a call via an app. Users move around without having a third-party present in the vehicle</p>	<p><b>Car as-a-service</b>            Transport tailor-made (large / small, basic / luxury,...) and on demand. Waiting time of a few minutes</p>	<p><b>Robotaxi</b></p> <ul style="list-style-type: none"> <li>• Privately used</li> <li>• Dynamic trajectory</li> <li>• Smaller vehicles (2-6 persons)</li> <li>•</li> <li>•</li> </ul>	<p>Waymo offers fully autonomous robotaxi rides (empty vehicle picks up customer) and operates in Phoenix, San Francisco and Los Angeles</p> 
<b>Pooled</b> 	<p>Autonomous vehicles are used after being called through an app.            The vehicle may make a stopover along the way to allow third parties to join in</p>	<p><b>Transport at lowest cost</b>            Efficient use of transport at a minimum cost.            Occupancy on average 1-2 people. Minimal detour or waiting time to pick up third parties</p>	<p><b>Roboshuttle</b></p> <ul style="list-style-type: none"> <li>• Pooled used</li> <li>• Dynamic trajectory</li> <li>• Larger vehicles (4-12 persons)</li> <li>•</li> <li>•</li> </ul>	<p>Volkswagen, MOIA &amp; Argo AI test ride-pooling service in Hamburg with the aim of commercial rollout in 2025 (2021)</p> 

# Analysis of available market studies

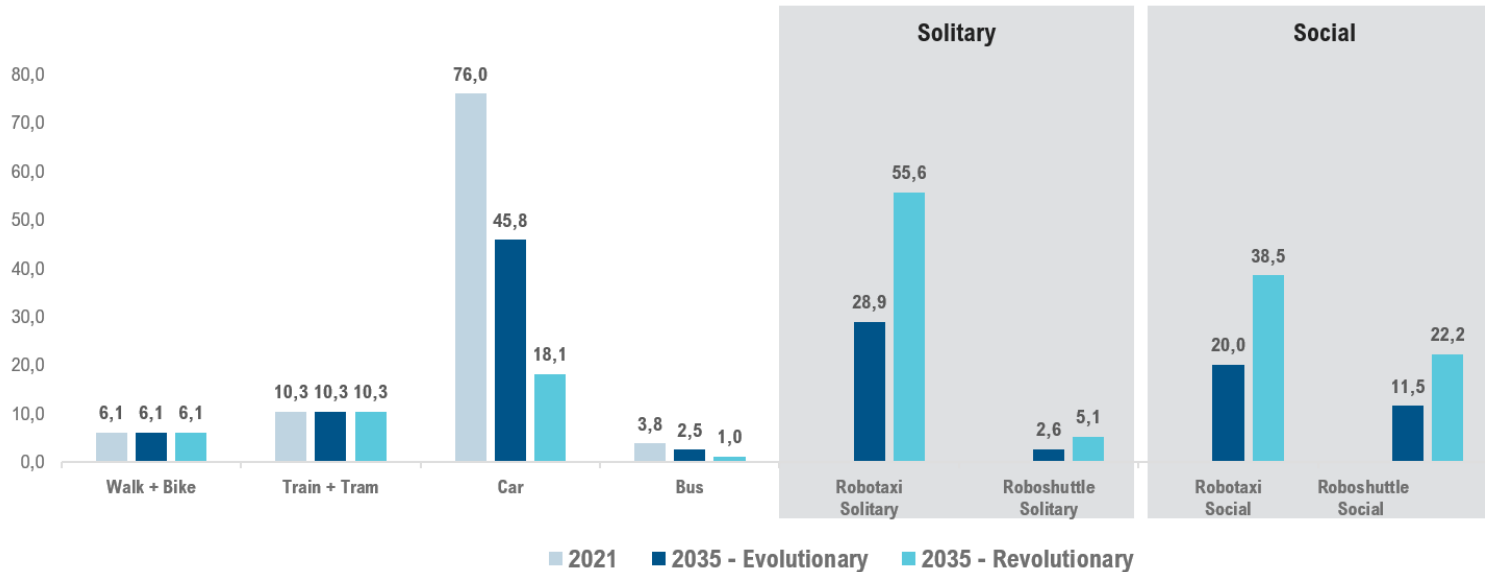
% Shuttle in Taxi-shuttle markt



## Projections shared automated driving Flanders

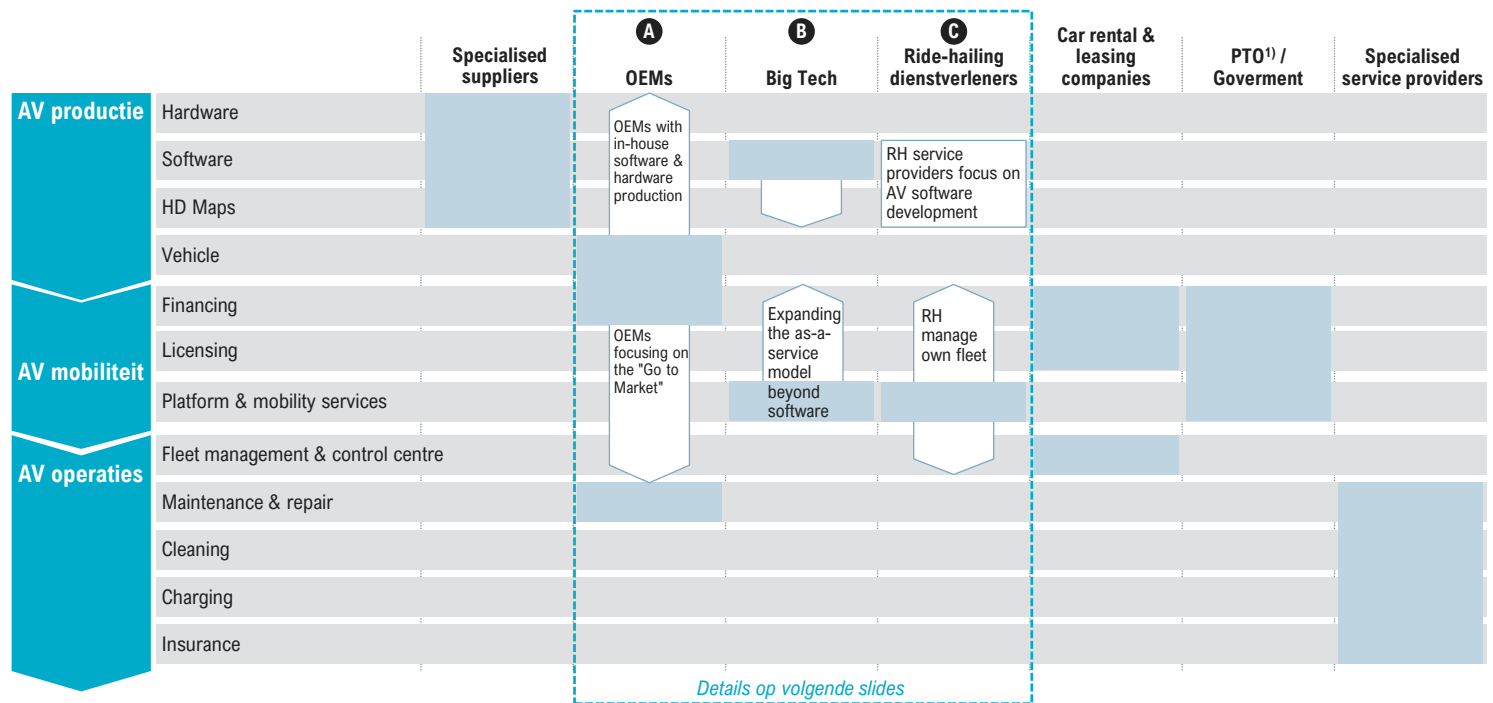
Modal split - % split passenger kilometres

Available study data applied on Flanders



# Traditional and new players are trying to expand their activities

## Autonomous vehicle value chain – Historical core activities & new activities



Details op volgende slides

■ (Historical) core activities

□ (Recent / Potential) new activities

1) Public Transport Operator  
Bron: Roland Berger

### Key insights

- **Big Tech** prefers **partnerships for setting up operational aspects** of the service (depot management, 1st line service, operation of traffic control center,...) so that they can focus on the autopilot technology and software for traffic control center & customer platform, which are the scalable components from the value chain
- **OEMs and ride-hailing service providers** are experiencing **difficulties with in-house development** of AV software
- The production of the actual vehicle remains with the OEMs
- Small passenger vehicles are currently the main focus of AV players (2-6 people)



# The government itself must take 8 active roles in the AV value chain of the future in order to steer the market in the desired direction

Active role of government in the AV value chain - Roles



## **A** Ecosysteem connector

*Stimulating Flemish innovation and business development*

## **B** Customer platform

*Linking supply and demand for pooled transport and specific needs*

## **C** Infrastructure-operator

*Providing public parking, charging and maintenance facilities*

## **D** Network architect

*Developing a smart, integrated set of nodes and networks*

## **E** Multimodal traffic manager

*Monitoring and controlling traffic flows, including through smart pricing*

## **F** AV fleet-operator

*Operating an AV fleet focused on pooled transport and specific needs*

## Omkadering



## **G** V2X-coordinator

*Drafting and ensuring the roll-out of a roadmap for digital and physical infrastructure development*

## **H** Retraining and recruitment

*Providing (re)training and recruitment for the AV sector in Flanders*

# Government roles

## **Ecosystem connector**

Stimulates innovation and technological developments in companies and the public sector active throughout the value chain

- Building on existing structures (e.g. Vlaio)
- Contact with international innovation initiatives (e.g. Horizon EU CCAM partnership)
- Tech lead outside EU but opportunities in flanking services and components

## **Customer platform**

Link supply and demand for pooled transport and specific needs

- 1 central customer platform (Ruter) : efficient pooling, less empty kms and congestion – limited market forces in platforms
- Private operators with their own customer platforms with obligation to open API for info and booking robotaxi/roboshuttle : less efficient pooling, more empty kms and congestion – full market functioning for platforms

# Government roles

## **Infrastructure operator**

Providing public parking, charging and maintenance facilities

- Spatial planning plan for the mobility infrastructure – where loading, cleaning, maintenance..
- Government controls crucial infrastructure but development is capital intensive
- Use of existing infrastructure (parking buildings) ? Role of existing and new depots De Lijn ?
- 

## **Network architect**

Develops a smart, integrated set of nodes and networks

- Design transport network, service levels and minimum quality requirements with focus on scale and spatial distribution, inclusiveness
- Provides input to permit criteria for operators

# Government roles

## **Multimodal traffic manager**

Monitoring and controlling traffic flows, including through smart pricing

- Multimodal approach to control traffic flows in real time using new data sources
- Can be done through flexible pricing:  
innovative forms of road pricing and flexible pricing pooled AV

## **AV Fleet operator**

Operating an AV fleet for pooled transport and specific needs

- Government instrument with strategic control and acting power in mobility aimed at efficient pooling, correct capacity dimensioning and inclusion
- Launch via pilot projects – catalyst for the development of other roles

# Government roles

## **V2X coordinator**

Rollout of a roadmap for digital and physical infrastructure development

Governments can improve the investment climate through V2X. V2X will increase safety and efficiency of autonomous and regular traffic. Possible role in autonomous transport to be investigated

## **Juridisch**

Framework for authorisations, pilot projects and final implementation

- Pilot projects: optimising collaboration
- Large-scale commercialization : framework to be developed

## **Local mobility management**

Autonomous transport will have a significant impact on mobility plans

Circulation plans, pickup & dropoff locations (pudo), provided space or access restriction

# Shared autonomous driving brings the end of an era in mobility and creates the need to prepare a broad transformation in consultation with all governments involved



## Most urgent actions

- Setting up a Flemish advisory centre or **task force/knowledge cell** that coordinates further elaboration of roadmap and guides all actors involved in their preparation
- Design and elaboration of **pilot projects** that will act as a catalyst for the elaboration of all other indicated roles and actions



**In mobility, the most profound disruption since the introduction of the passenger car is being prepared today ...**



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