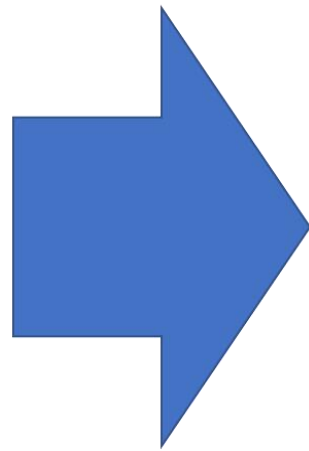# I-AT
Interregional Automated Transport

1. I-AT – project goals

28 JANUARY 2016 • 4:45PM

The first self-driving electric shuttle for use on public roads has taken to the road in the Netherlands. The "WEpod" took six passengers down a 200m stretch of street in the first trial of its kind.

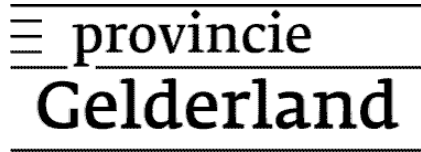2014-2016

Interreg - Automated Transport

2017-2020

- Development and knowledge sharing
- Innovations in autonomous driving
- Products and processes
- Prototypes and test series
- Innovation in the border region

1. I-AT – project goals
„Why do we do this?"

- Future mobility as an opportunity for everyone

- Road safety

- Boost eu-regional economy

- Gain experiences in innovative mobility approaches, which can contribute to existing public transport means, especially on less profitable location/routes → ensure public transport

- And also:

- Improve spatial planning in cities

- Solution for limited road capacities

- Pollution issues: cleaner mobility thanks to smaller and electric busses, reduction of emission and noise

2. I-AT – project organization

- 23 Dutch and German project partners
  - SME, GOV, R&D

provincie Gelderland

HAN

TU Delft

A B FromAtoB PUBLIC DESIGN

DYNTEQ
DE PRODUCTONTWIKKELAARS

RCS ROBOT CARE SYSTEMS

IKEM

bbh
BECKER BÜTTNER HELD

AIRPORT WEEZE

ASEAG

QING groep

Royal HaskoningDHV
Enhancing Society Together

intoEU

v-tron

projaegt gmbh

Zwart UG

STAD annual conference 2019

NOOT personenvervoer

Spring innovation management

2. I-AT – project organization

- *Subsidised by the EU via Interreg VA – programme: eu-regional cross-border co-operation*
- *Project structure: project management and 5 work packages*
  - Vehicle development
  - Living Lab Truck Platooning (Automated Connected Transport)
  - Living Lab Airport Shuttle Weeze
  - Living Lab public transportation Aachen - Vaals
  - Know-how Transfer
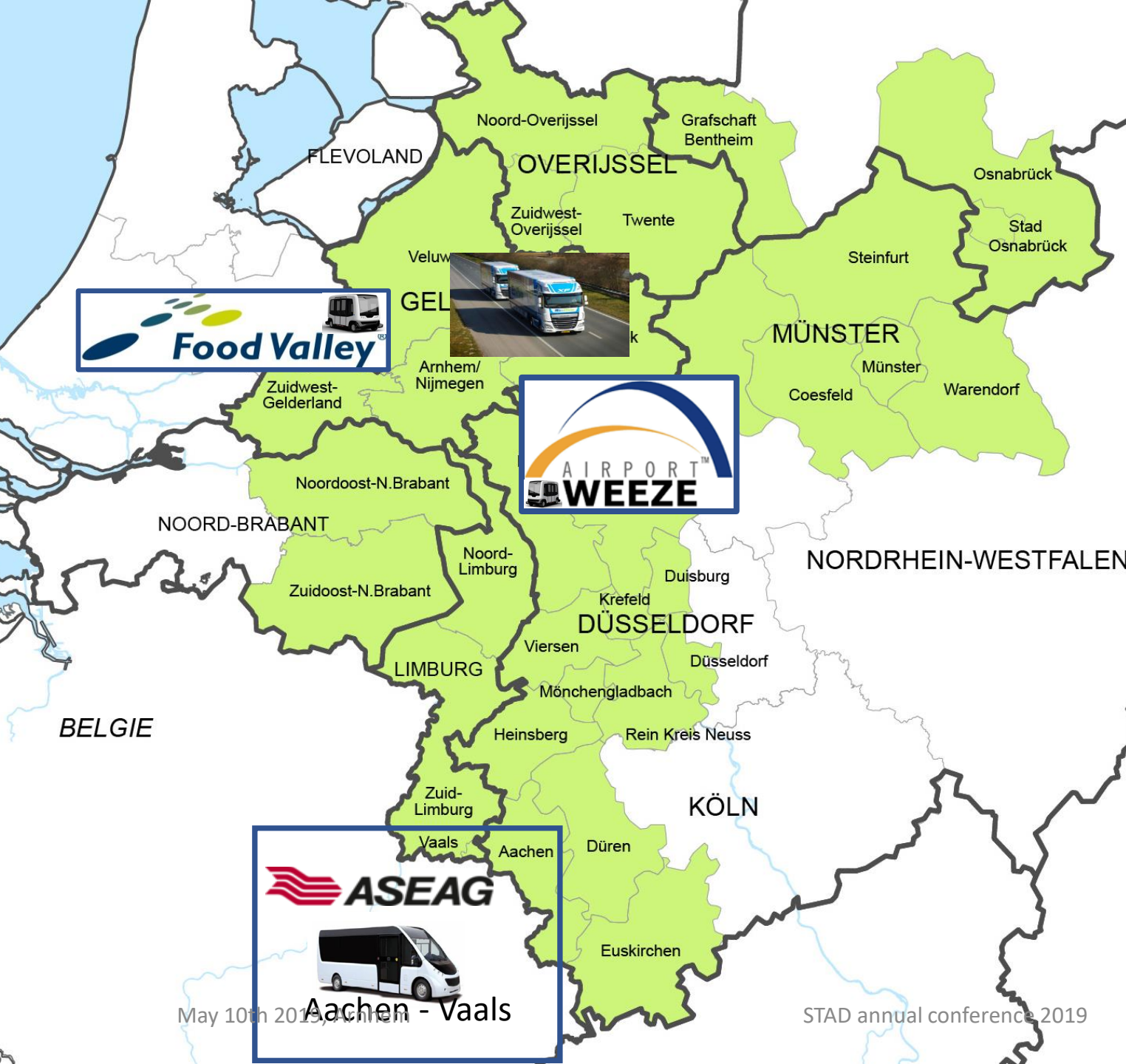
Locations Living Labs

3. I-AT activities
wp1: vehicle development

Goals

- (continue) development of automated driving technology
  - for WEpods and Mission

- Develop new automated vehicle "Mission" and obtain NL and DE waiver

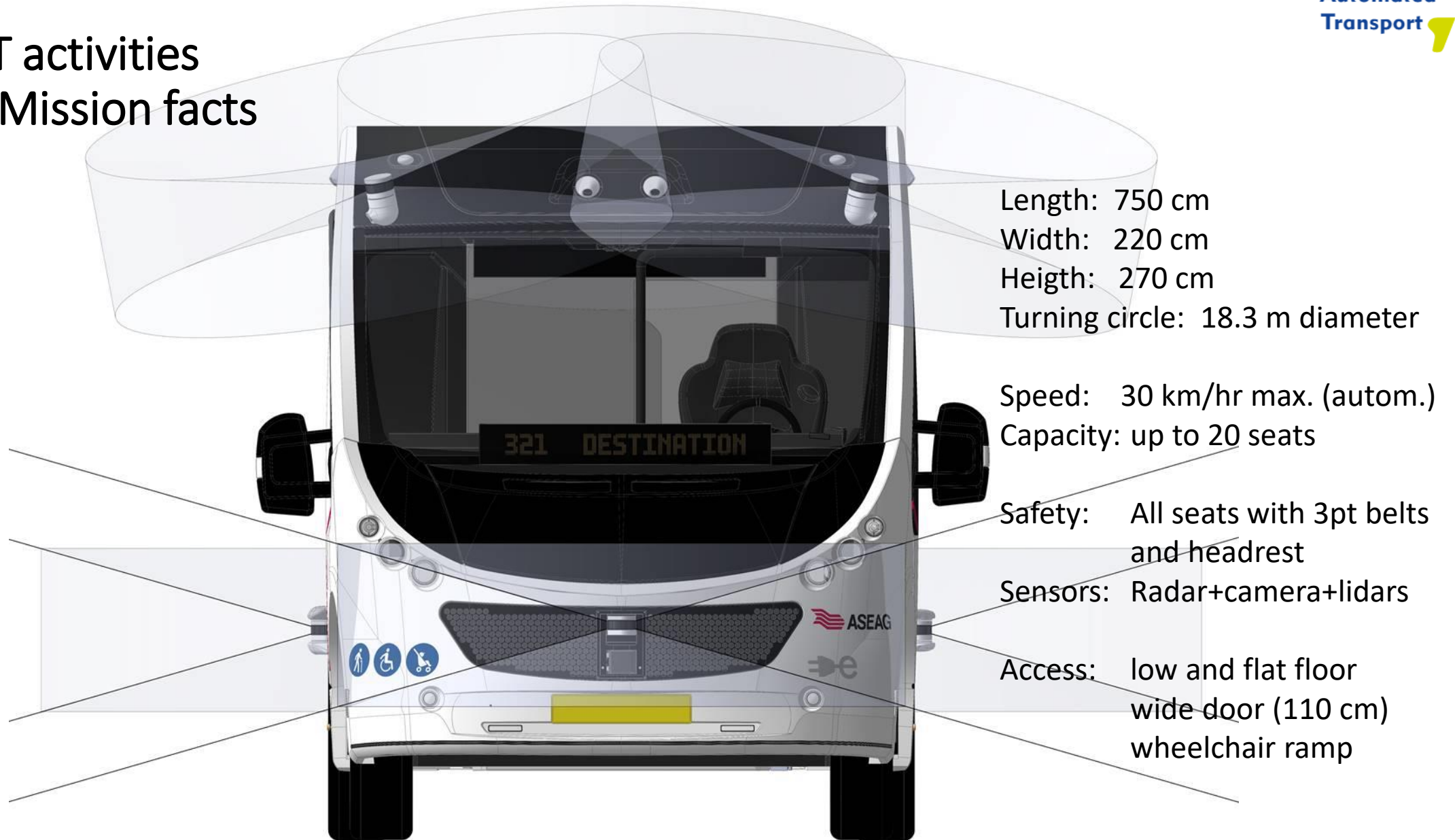- Perform and support Living Labs

3. I-AT activities
wp1: WEpod facts

WEpod

- 6-persons cabin
- H 275 cm, W 199 cm, L 393 cm
- 4 steering wheels
- E-motor range of approx. ca. 80 km; loading 230V
- 4 braking-systems: regenerative braking on motor (normal use), hydraulic brakes, elec. parking brake brake on motoraxes
- Easymile (type EZ10), add. tech developed in I-AT
- 6 lidar sensors → localisation and object detection
- 2 GPS-RTK sensors
- Max. speed at Weeze 15 km/h
- 3 driving modes: auto, semi-auto (auto steering, speed via steward), manual (met joystick)

3. I-AT activities
wp1: Mission facts

Length: 750 cm
Width: 220 cm
Heigth: 270 cm
Turning circle: 18.3 m diameter

Speed: 30 km/hr max. (autom.)
Capacity: up to 20 seats

Safety: All seats with 3pt belts
           and headrest
Sensors: Radar+camera+lidars

Access: low and flat floor
           wide door (110 cm)
           wheelchair ramp

3. I-AT activities:
wp2: Living Lab truck platooning (automated connected transport)

Goals

- Answering the questions:
  - Is there a business case for truck platooning?
  - How would this business case looks like?
  - What is needed to go across borders with truck platooning?

- <u>Activities and approach</u>
  - Technical research
    - Truck platoon
    - Connectivity
  - Research legal and security aspects NRW
  - Exchange experience with stakeholders
  - Lobbying

3. I-AT activities
wp3: Living Lab Airport-Shuttle Weeze

Goals

- Perform Living Lab Airport-Shuttle Weeze

- Develop test scenarios and build functional test riggs for the vehicles in Living Labs Weeze and Aachen-Vaals

- Support definition of functional requirements

3. I-AT activities
wp3: Living Lab Airport-Shuttle Weeze

Goals

First results!

3. I-AT activities
wp3: Living Lab Airport-Shuttle Weeze

Activities

- Enhance functionality & robustness of existing WEpods

- Legislative proceedings for certification, obtaining waiver in Germany for public road at Weeze Airport

- Site assessment for people transport services

- Adaptations to Weeze infrastructure

- Digitalisation of map for Weeze environment

- Run 6 month testphase incl. passenger survey

3. I-AT activities
wp3: Living Lab Airport-Shuttle Weeze

- Infoboard at Airport Weeze

Banner Weeze groot: 450 cm x 200 cm

3. I-AT activities
wp3: Living Lab Airport-Shuttle Weeze

Status

- Kick-off 21st February 2019, 6 month test period

- 1st automated shuttle on public roads in Nordrhein Westfalen (NRW)

- "Ausnahmegenehmigung" (exception waiver) for the NL-WEpods
  via Federal Government NRW (Bezirksregierung Düsseldorf)

- 2 routes for passengers on the Airport

- Accompanying scientific studies on
  - passengers experience/acceptance
  - behaviour other traffic participants towards automated vehicle
  - Technical and functional performance

3. I-AT activities
wp4: Living Lab Aachen – Vaals

Goals

- Development and realization of a test programme of an autonomous driving cross border shuttle (Living Lab)
  - Gain experience in organization of autonomous public transport
  - Define route Vaals – Aachen University medical center
  - Get approval of the route
  - Development of mobility service offers (App)
  - Implement on-demand system NetLiner
  - Get to know the customer requirements for an autonomous shuttle

3. I-AT activities
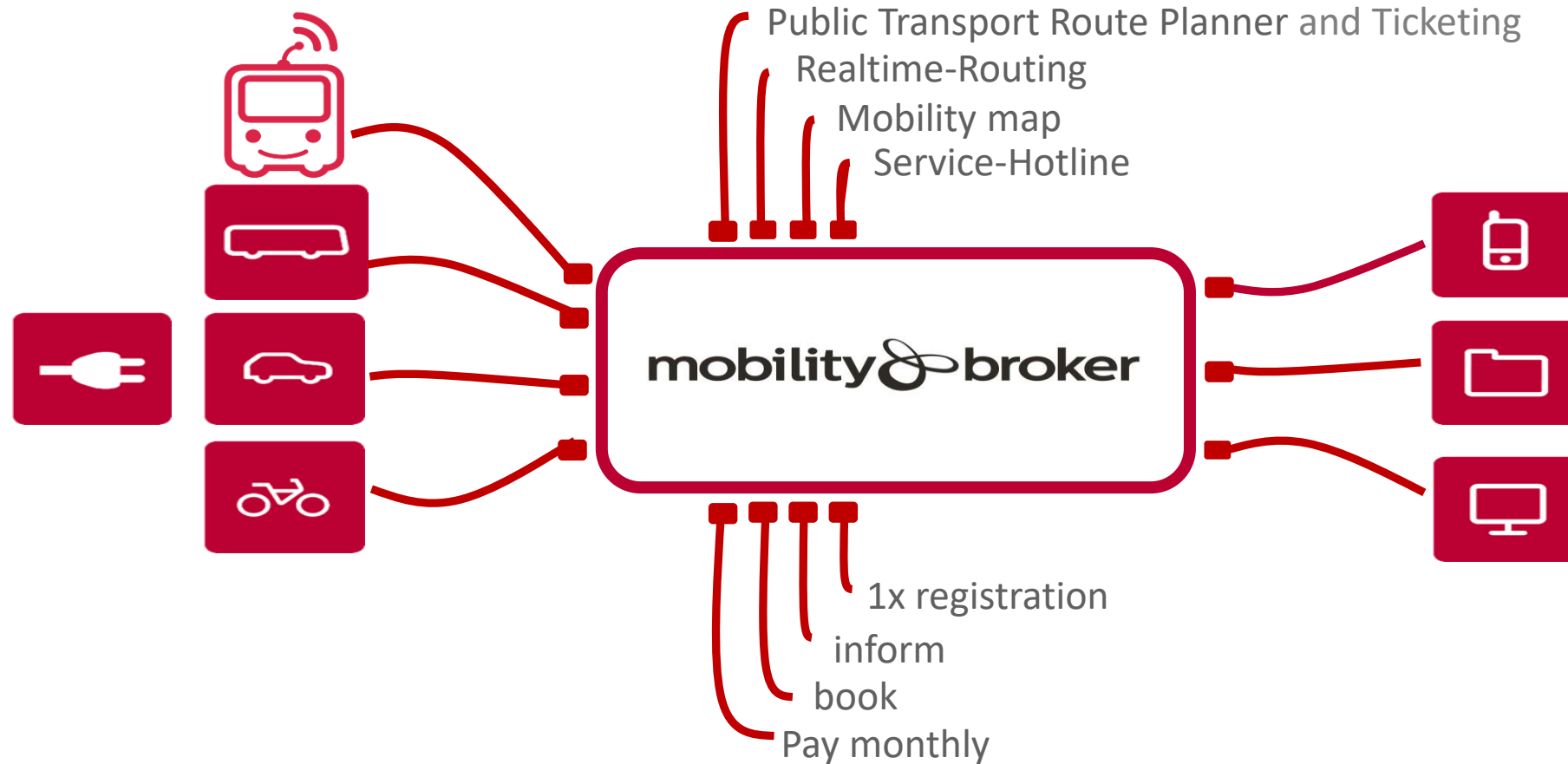## wp4: Living Lab Aachen – Vaals

Activities and approach

- Continue route approval and waiver process on Durch and German Side

- Proposals for control room software

- Develop concept for user analysis (Questionnaire in 3 parts), strongly linked to wp3
  - Socio-economic and demographic characteristics
  - Benefits of automated /autonomous electric shuttles
  - Issues of automatic shuttles
  - Comfort
  - 'user-friendliness'
  - Safety/security
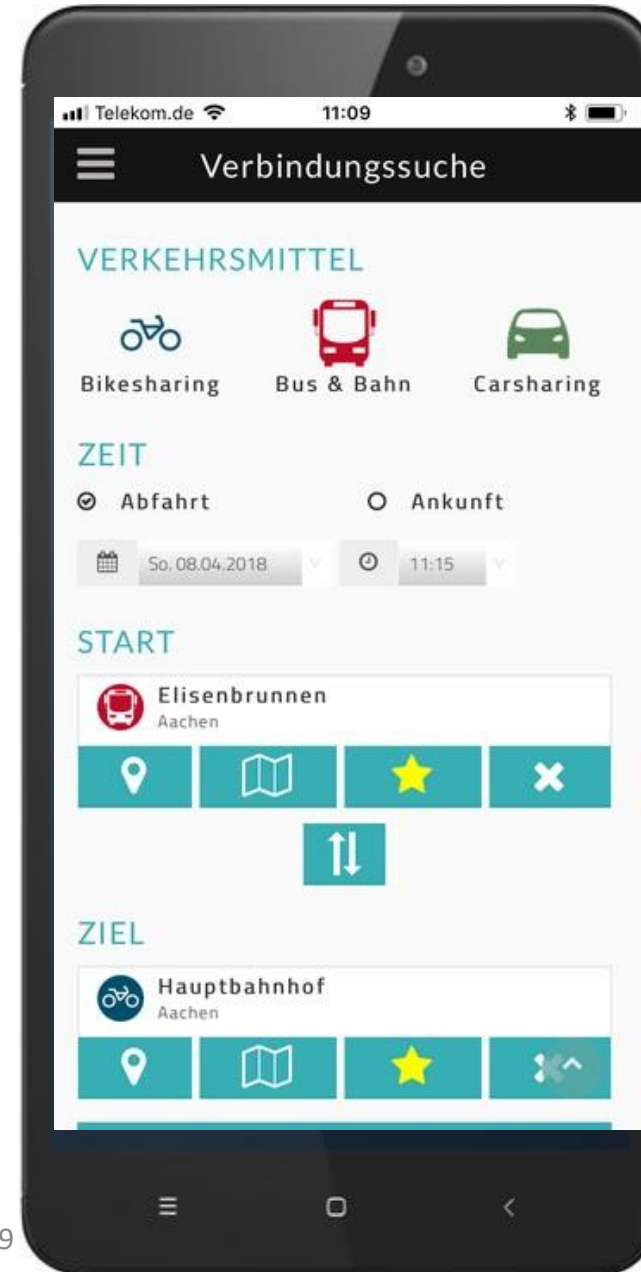- Integration of automated shuttle into Mobility Broker (MaaS App)

3. I-AT activities
wp4: Living Lab Aachen – Vaals

- Mobility Broker: A digital central point of entry to connected mobility

Public Transport Route Planner and Ticketing
Realtime-Routing
Mobility map
Service-Hotline

1x registration
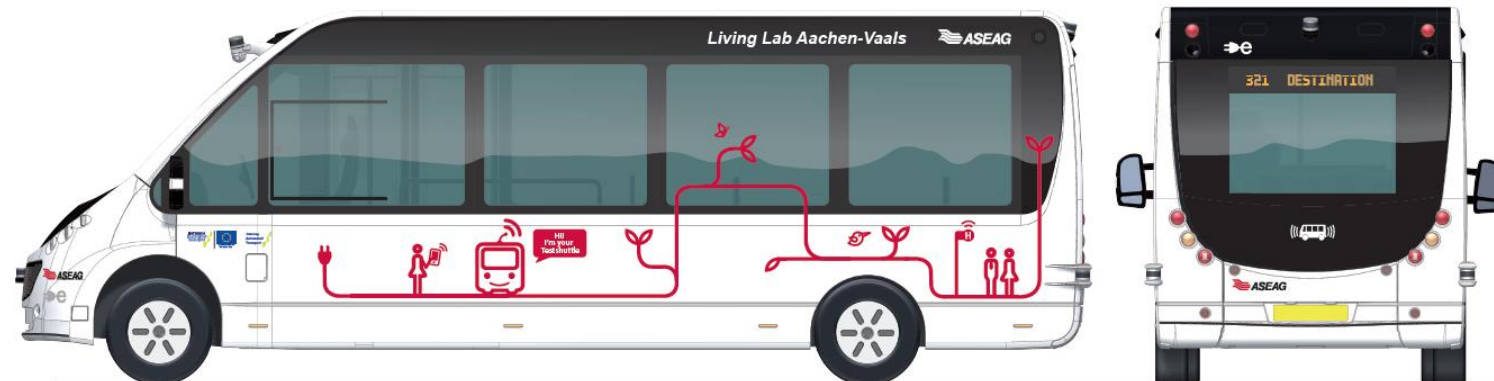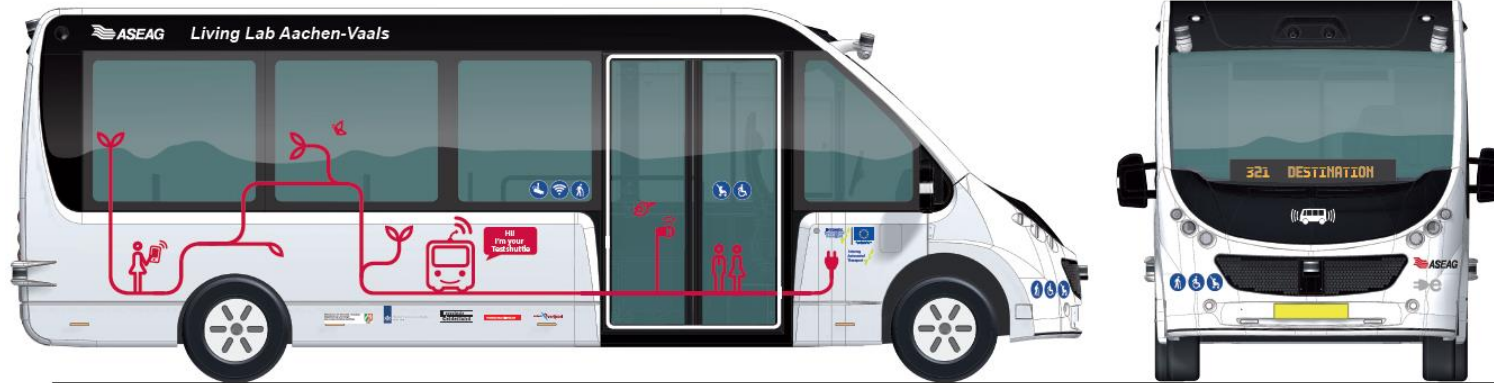inform
book
Pay monthly

3. I-AT activities
wp4: Living Lab Aachen – Vaals

3. I-AT activities
wp4: Living Lab Aachen – Vaals

Mission Design

3. I-AT activities
wp4: Living Lab Aachen – Vaals

Next steps

- Continue approval process

- Finalize implementation of hardware for public transport means in the vehicle

- Finalize integration in Mobility Broker (MaaS)

- Control room solution

- Communication strategy

- Develop test scenarios for the Living Lab

3. I-AT activities
wp5: Knowledge Management

Goals

- Connect I-AT to external knowledge networks (acquire knowledge)
- Communicate I-AT activities and results
  - Licenses, approval
  - Business cases
  - Communication strategy
- Create, provide and share knowledge within I-AT
  - Legal
  - Infrastructure
  - Digital Infra
  - Technical
  - Deployment and Human Factors

3. I-AT activities
wp5: Knowledge Management

Goal: Communication and knowledge transfer

- Strategic Communication Plan →inform SME's and knowledge institutes

- inspire product and process innovations
  - high-tech companies and universities on technical innovation opportunities based on automated driving
- Share knowlegde and experience
  - For example logistics and transport providing SME's
- On Legal and knowledge aspects of automated driving
  - professional services SME's that provide legal assistance, (driver) training & automotive services

3. I-AT activities
wp5: Knowledge Management

Activities: Strategic Communication Plan

- Map stakeholders / SME target groups (input partners appreciated)

- Workshops for target groups: HTSM-sector, launching customers of technology

- Company days at Living Labs in Weeze and Aachen - Vaals

- Actively sharing knowledge via I-AT website

- Participation at strategic events

- Evaluation (discuss at project meetings)

4. I-AT lessons learned so far

- Who's the driver and who's liable? - vehicles are legally not really existing, not yet harmonised accross the EU

- Approval automated vehicles across the border: →2 partially different legal conditions, different structures and processes in NL and DE

- Exchange of know-how and experience between all stakeholders is crucial in order to come to common practises and subsequently structural knowledge and solutions

- Management of expectations to the inside en outside world, expections are very high

- "soft issues" as ethics, acceptance, tangability of the unknown are crucial

- Special I-AT: Cultural differences between Germany and the Netherlands → production vs. trading culture

- Living Lab Aachen (GER) - Vaals (NL) offer this opportunity

8. Questions? More information? Always welcome!