



Automated vehicles on public roads
Clean Mobility Centre

Alwin Bakker
a.bakker@gelderland.nl
www.wepods.com



De Telegraaf

NOS

omroep gld



metro 

NRC 
HANDELSBLAD



fd.
het financieel dagblad

rtl nieuws

de Gelderlander



Hart van Nederland

T **tweakers**

SPITS
spitsnieuws.nl
Nieuws & Entertainment

Rijksoverheid



NDTV



The Washington Post

英文中國郵報
The China Post

Mashable



B B C



EASY
MILE
EZ10

WEpods

A world first

- On public roads
- No steering wheel
- No brake pedal
- No driver ?



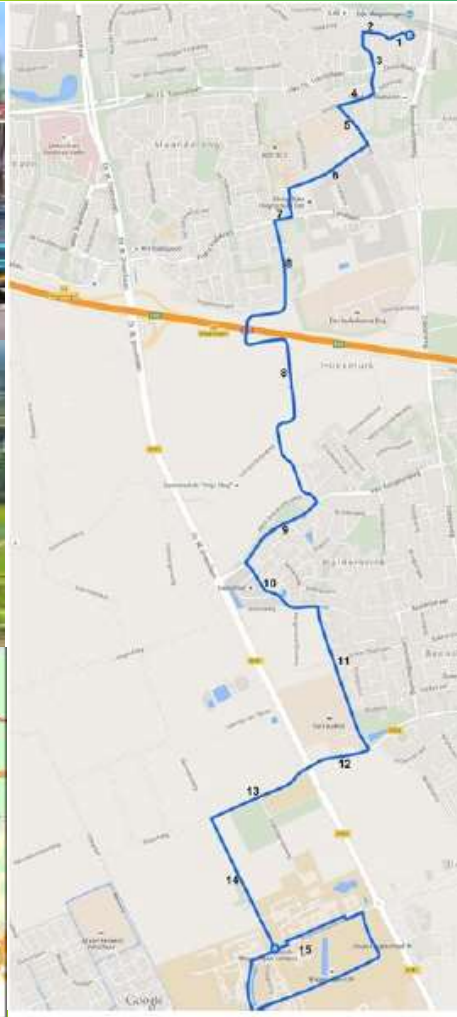


The WEpod

From Railway Station Ede/Wageningen to Wageningen University

At the WUR: Driving on the campus

25 km/h



WEpods route

Ede-Wageningen train station to Wageningen University (11km)

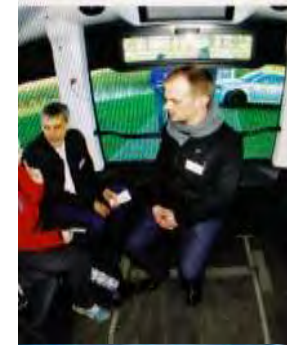
- Urban (<50 km/h)
- Diverse traffic: cars, pedestrians, cyclists
- Traffic lights (1 extra)

Testing

- Steward on board (monitor, stop, intervene)

Deployment

- Control room monitoring



WEpods Gelderland NL



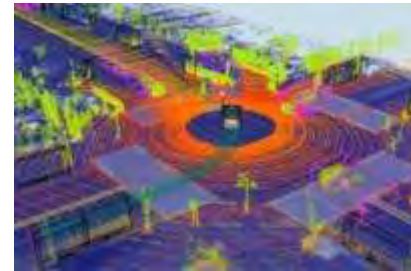
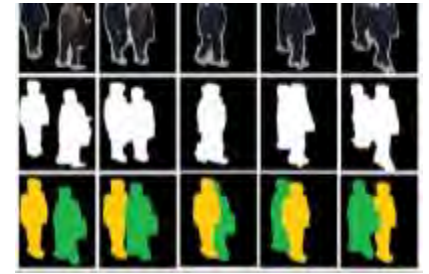
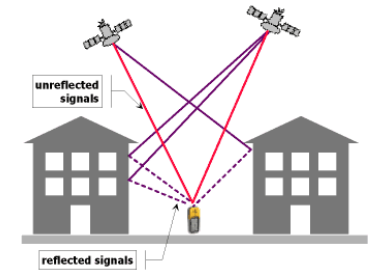
“**The first** selfdriving vehicles in the Netherlands will drive in Ede and Wageningen” (Gelderlander 1 Oct 14).

- Vision
 - **24/7 on demand “public” transport**
 - Affordable in low demand areas
 - Last mile (train to door)
- Innovation
 - From closed track to public roads
 - Safe interaction with pedestrians, cyclists, cars
 - Not yet managing a growing fleet of driverless shuttles



How does it work?

- Digital map
- Localization
- **Camera's**
- Radars
- Laser scanners
- Ultrasonic sensors
- Operator



Technology



Vehicle: EASYMILE EZ10

- Citymobil2
- Safe stop
- 4 lasers

EASY
MILE



Additions

- D-DPS/RTK + INS + Odometry + landmark positioning
- 8 camera's + 8 radars + 8 ultrasonics
- 6 multilayer lasers
- 11 computers
- Interior camera
- Interior + exterior intercom
- 2x4G + 3G + Wifi-P communication
- 20KWH batteries
- Heater, belts, roller chair fixation, wiper, 3rd brake light, int. covers, steward seat

Supervisor system

User App

Infotainment

Vision

Dedicated cameras



Use: Object detection (with radars)
Classification

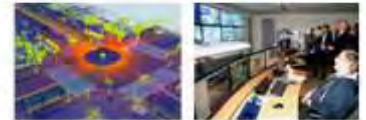


Camera
Radar
Ibeo laser
Sick laser



Challenges

- Technical reliability
- Behaviour of other road users
- Behaviour/emotions of passengers
- Behaviour/emotions of residents
- The definition of a driver
- Data and data safety
- Legal issues
- Ethical **dilemma's**
- ...





Challenges

Navigation

Stay on, follow, the road

Narrow lanes (bi-directional / no multilane roads)

Follow rather than overtake

Handling other traffic

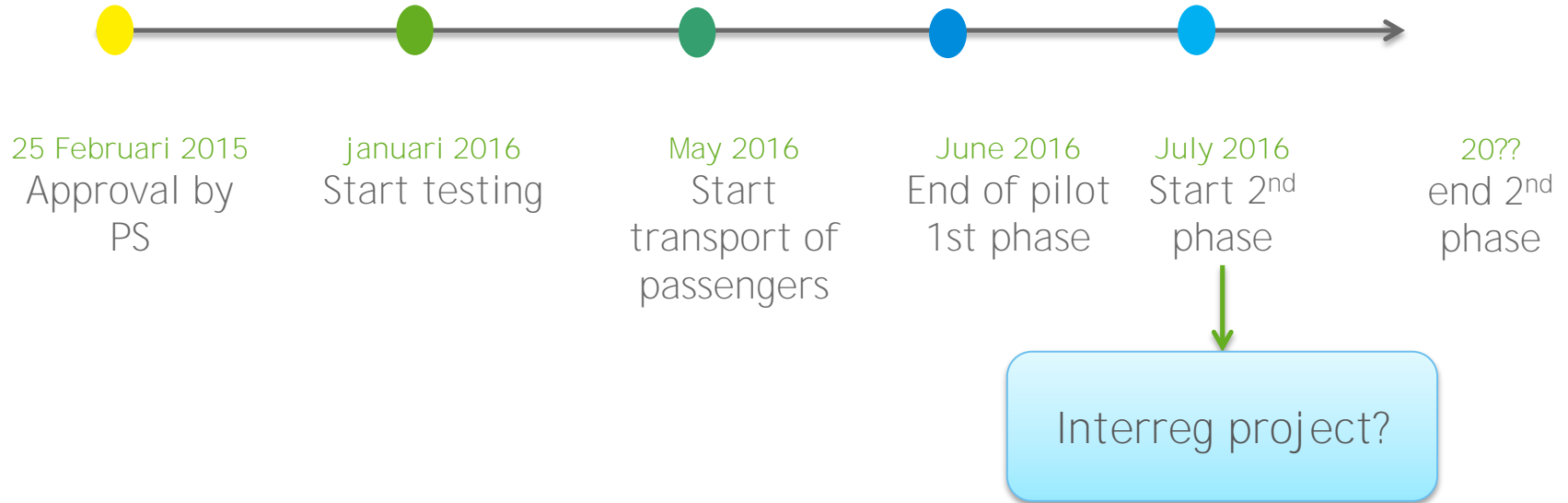
detect, track, classify

predict path

safely interact

communicating traffic light at challenging locations

Planning



Consortium

Projectteam



Spring
innovation
management





JOIN THE COMMUNITY!

Register at www.wepods.com