The road from pilots to implementation.
Lessons learned based on knowledge gained from practice

Workpackage 7: Casestudies & demonstrators
Researcher: Reanne Boersma
Supervisors: Bart van Arem & Frank Rieck

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HOGESCHOOL ROTTERDAM

When do you think we'll have AVs operating in our PT system?

A. <5 years
B. 5 – 10 years
C. >10 years
D. Never

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Spatial and Transport Impacts of Automated Driving

From Appelscha to Japan

2016 – 2020

- **Appelscha**
- **Rotterdam the Hague Airport**
  (collab. with Rebel Group)
- **WEpod**
- **Rivium ParkShuttle**
- **AV in Japan**
- **AV meets PT**
  (collab. with Goudappel)
- **Automated buses in Europe**
  (collab. with Autobus project)
- **TRB paper from pilot to implementation**

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Final paper: TRB

Status: under review

What are the characteristics of promising situations where automated vehicles can be deployed in public transport based on knowledge gained from practice?

TRB
TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES

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Spatial and Transport Impacts of Automated Driving

3 aspects

- Type of environment
- Average speed
- Presence of on-board steward

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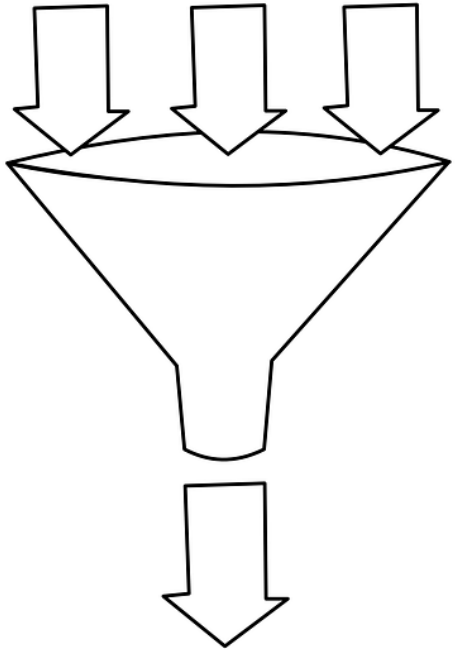
Input

1. Pilots in Europe
2. Appelscha
3. WEpod
4. Rivium ParkShuttle
5. AV vs PT
6. American studies



Pilots in Europe

	Country	Project	Location	Date	Vehicle	Capacity	Speed	Route	Length	Infrastructure	Research	More information
1.	Austria	auto.Bus - Seestadt	Seestadt	June 2019 - end date not mentioned	Navya Arma	Max 11 passengers (11 seated and 0 standing)	Max 20 km/h	Test track leads from the subway station Seestadt via the stops "Seeseiten", "Susanne-Schmida-Gasse", "Schenk-Danzinger-Gasse" and "Maria-Tusch-Straße" to the "FeelGood" Apartments	2000 m	Not mentioned	To follow where the vehicle is currently (as there is no timetable yet): https://www.wienerlinien.at/eportal3/ep/channelView.do/pageTypeId/66533/channelId/-4400687	1. https://www.ait.ac.at/en/news-events/single-view/detail/5318/?no_cache=1 2. https://de.wikipedia.org/wiki/Autonomer_Bus_(Wien)
2.	Austria	Digibus© 2017	Koppl (Salzburg area)	April 2017 - November 2017	Navya Arma	Max 11 passengers (11 seated and 0 standing)	Max 16 km/h	Public road with mixed traffic in a rural area.	1400 m	Road mostly lacking road markings, varying inclines, varying mobile network coverage, varying quality of GNSS and correction signals, other road users driving at speeds up to 60 km/h per hour or varying weather conditions	Salzburg Research Forschungsgesellschaft	1. https://www.digibus.at/en/news/ 2. https://etrr.springeropen.com/articles/10.1186/s12544-018-0326-4

118 pilots!

Appelscha – WEpod – Rivium ParkShuttle

Bicycle lane

Little infrastructural changes

Max 15 km/h

Steward on-board

Mixed traffic

Little infrastructural changes

Max 25 km/h

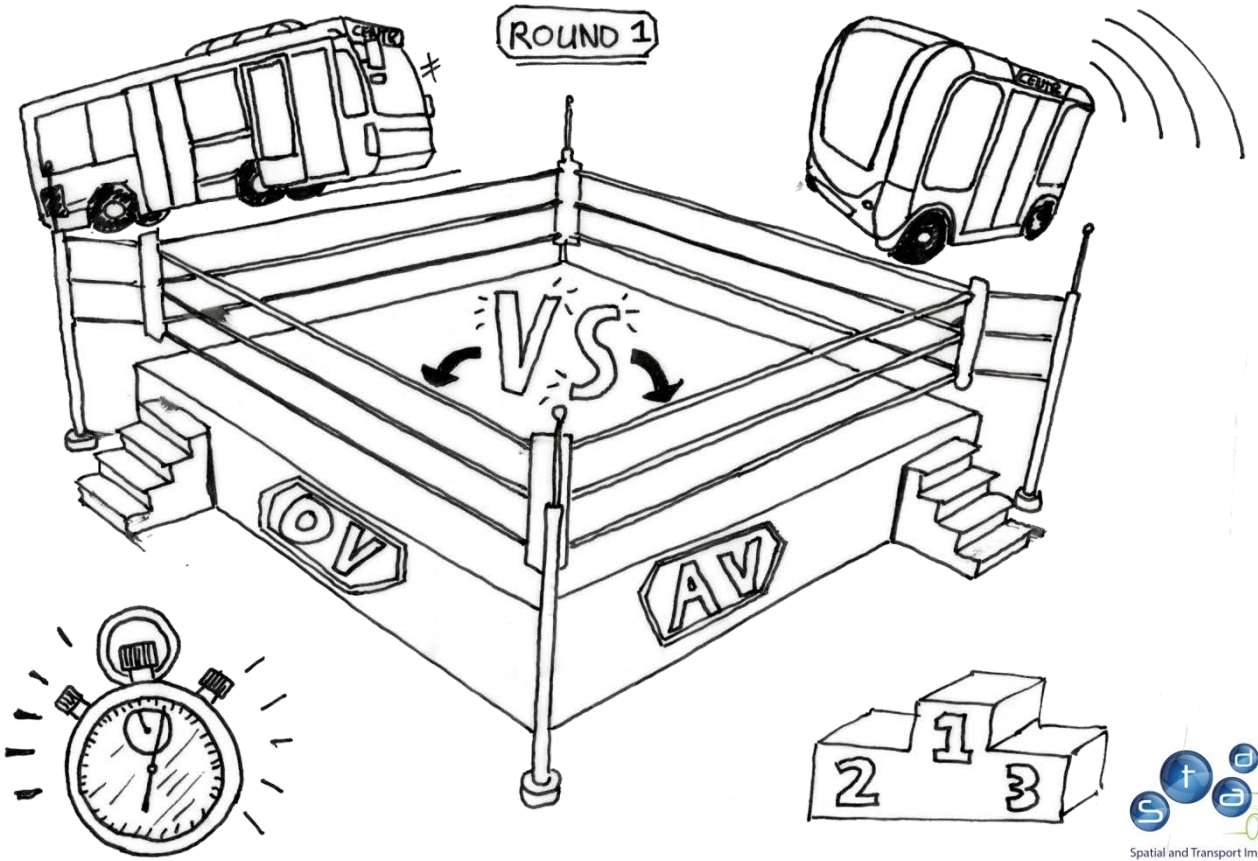
Steward on-board

Dedicated infrastructure

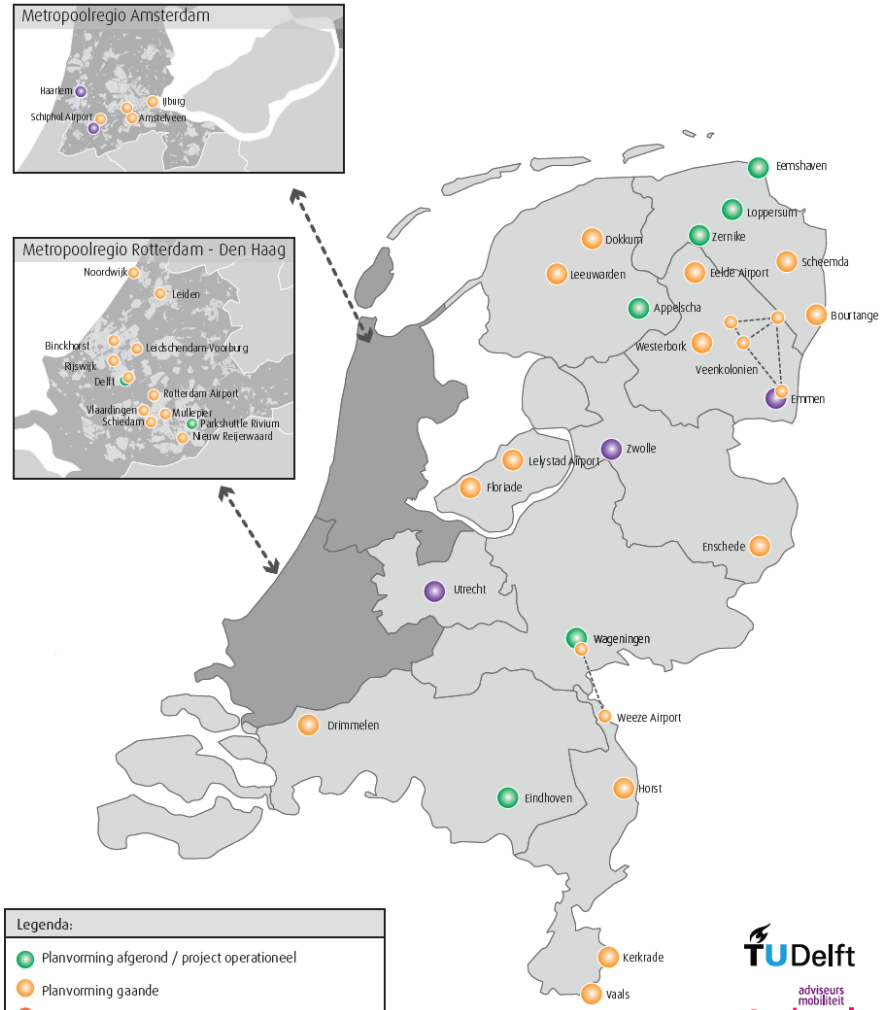
Max 32 km/h

Steward in control room

AV vs PT



Pilots in the Netherlands



Spatial and Transport Impacts of Automated Driving

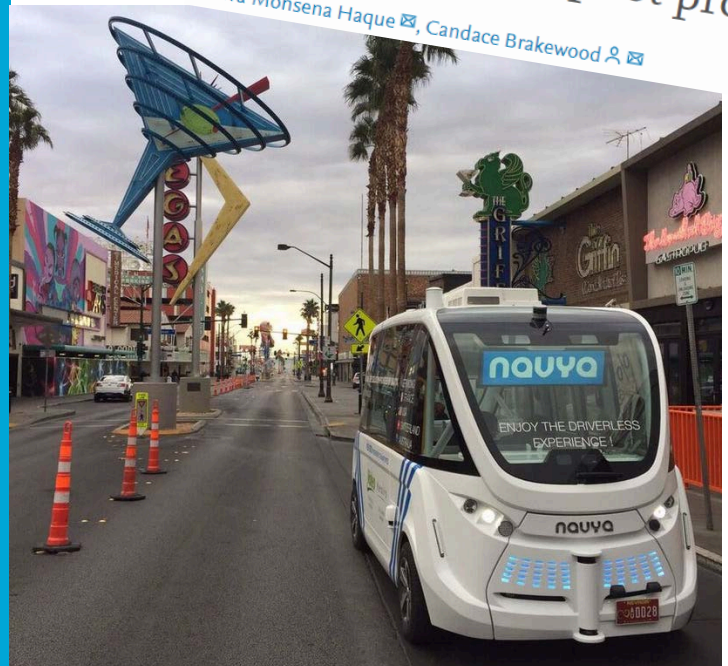
American studies

FTA RESEARCH
FEDERAL TRANSIT ADMINISTRATION

Strategic Transit Automation Research Plan

A synthesis and comparison of American automated shuttle pilot projects

Antora Mohsena Haque, Candace Brakewood



Bloomberg Philanthropies THE ASPEN INSTITUTE

We spent 2017 scouring the globe to understand how cities are preparing for AVs

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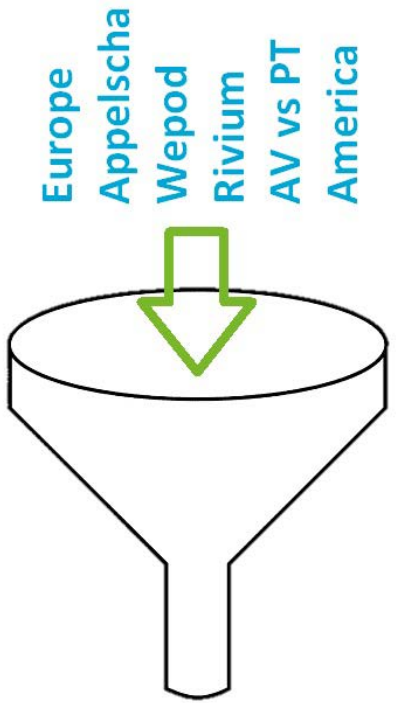
Spatial and Transport Impacts of Automated Driving

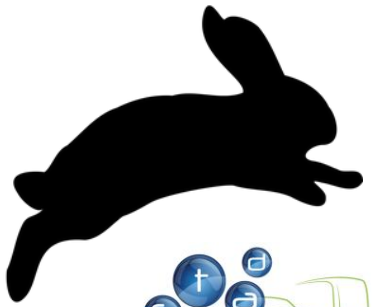
Results

What are the characteristics of promising situations where automated vehicles can be deployed in public transport based on knowledge gained from practice?



How fast do you think the automated shuttles have driven on average?

A. 15 km/h
B. 21 km/h
C. 32 km/h
D. 40 km/h



Spatial and Transport Impacts of Automated Driving

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Results

Type of environment:

Semi-controlled, publicly accessible

Speed:

Below 21 km/h

Steward:

On-board

Results illustrated

COMPLEXITY

SEPARATED

MIXED

Made by Arthur Scheltes

Conclusion

What are the characteristics of promising situations where automated vehicles can be deployed in public transport based on knowledge gained from practice?

- Semi-controlled, publicly accessible environment
- Low speed (approx. 21 km/h)
- Steward on-board

With the abovementioned requirements, the possible implementations of the vehicles are often limited to short distances, such as first-/last-mile transport.

When do you think we'll have AVs operating in our PT system?

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D. Never

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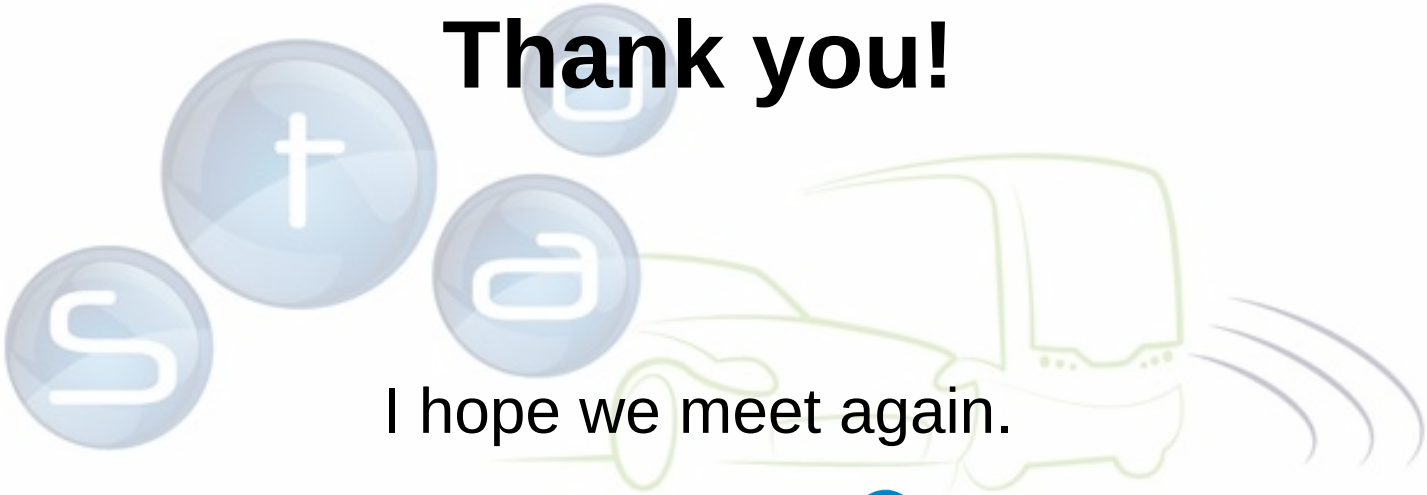
Spatial and Transport Impacts of Automated Driving

Supervisors, co-workers, partners, everyone who has been involved

Thank you!



I hope we meet again.

http://stad.tudelft.nl/

Reanne Boersma

TU Delft

Hogeschool Rotterdam