

POLIS

CITIES AND REGIONS FOR TRANSPORT INNOVATION

ANNUAL
CONFERENCE

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30 November
1 December, 2022
Brussels, Belgium



#POLIS2022

nemoH

- Operation of an autonomous shuttle in the Hannover Region

Tanja Göbler
Region Hannover

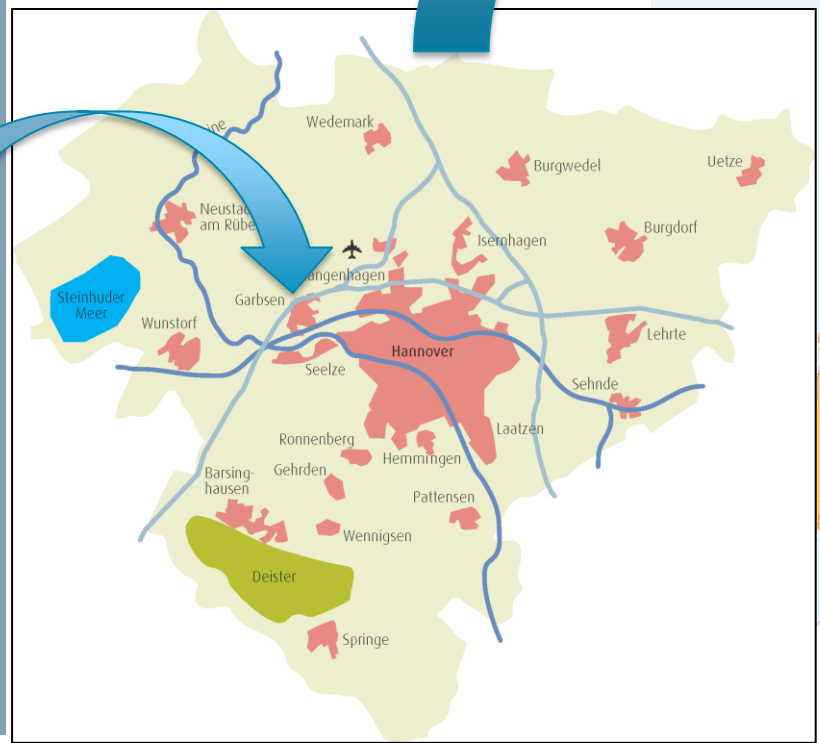
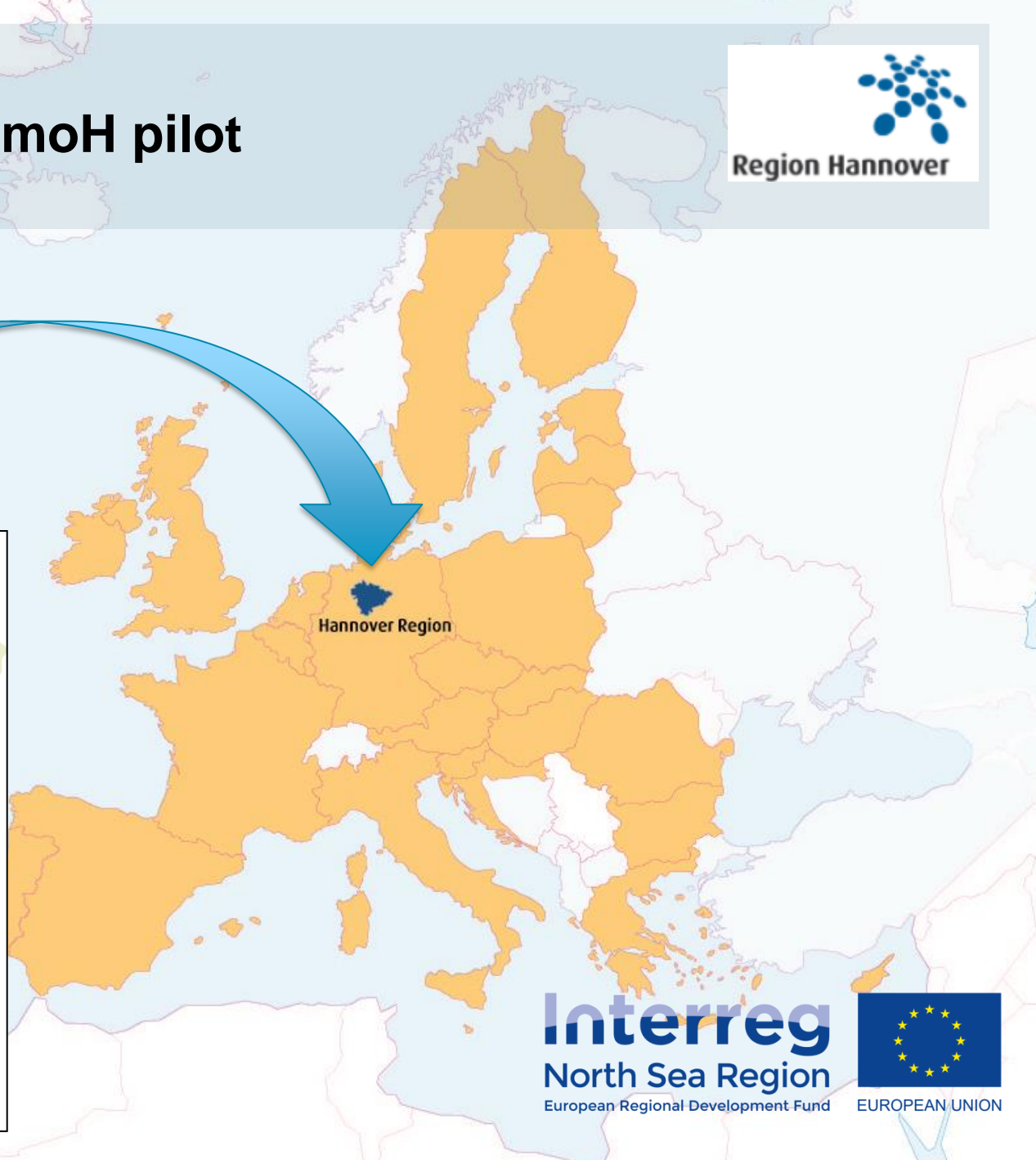
Fachbereich Verkehr

Betrieb eines autonomen Busses in Garbsen (Region Hannover)

Tanja Göbler – Lukas Arndt



Hannover Region: the nemoH pilot



Pilotsite
Hannover
Garbsen


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The nemoH-Project of Hannover Region

- Partner in the PAV consortium project (Interreg funding programme) for planning autonomous transport.
- Aim of PAV: Development of strategies for the integration of autonomous transport in sustainable spatial planning.



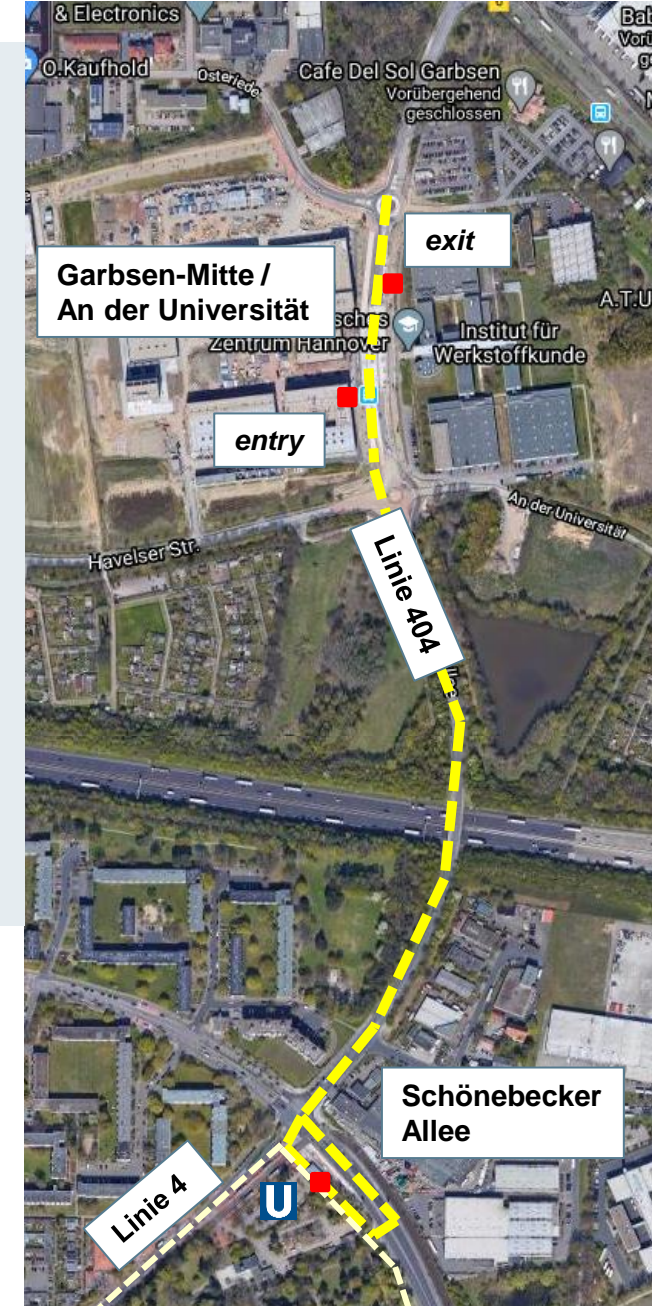
+ **Research partner** + **Partner project management + knowledge transfer**

- **Region Hannover is responsible for public transport in the region.**
- **regiobus is the responsible bus company**



Facts about the pilot

- Operation of an autonomous/automated bus by regiobus on an existing line 404 / connection between tram line 4 and the technical university
- Supplementation of the regular bus service during off-peak hours
- Integration into existing line
- approx. 10:00 - 16:00 h
- The line operates exclusively on weekdays (Mon.-Fri.)
- operating time: approx. 2.5 months,
- Start of operation: 29. August 2022
- End: 3. November 2022



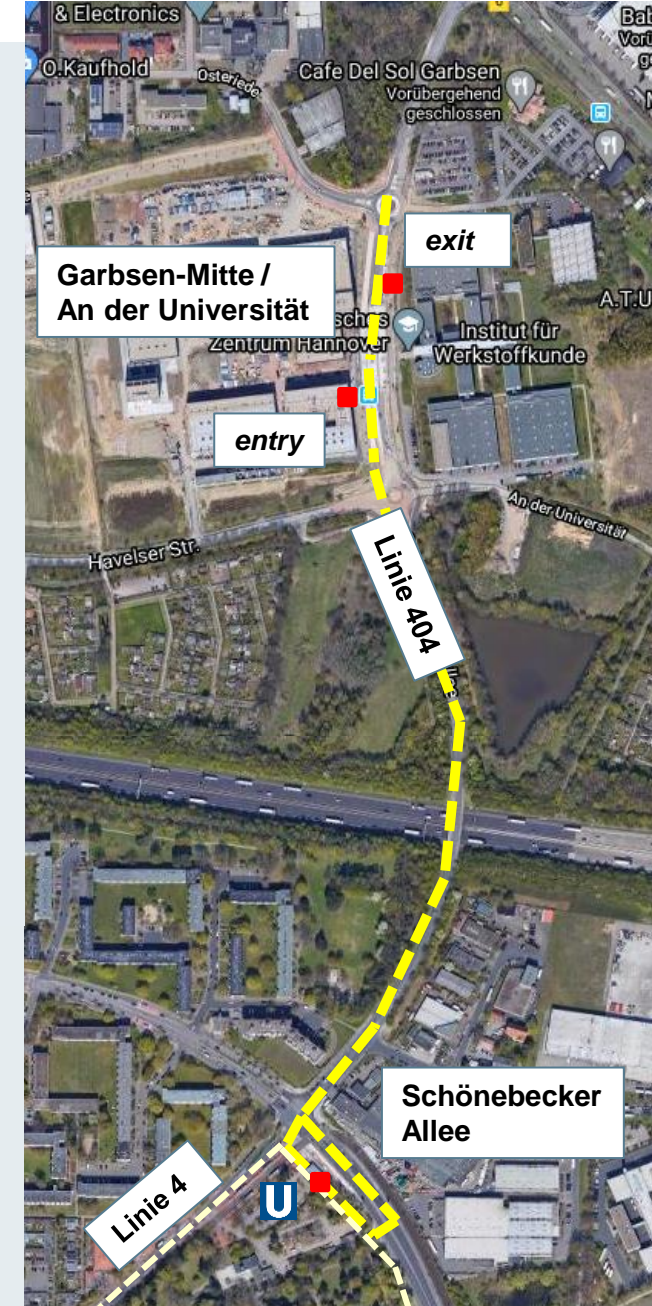
The route

Start at tram stop „Schönebecker Allee“

End at Campus Garbsen („Garbsen-Mitte / An der Universität“)

Busline 404

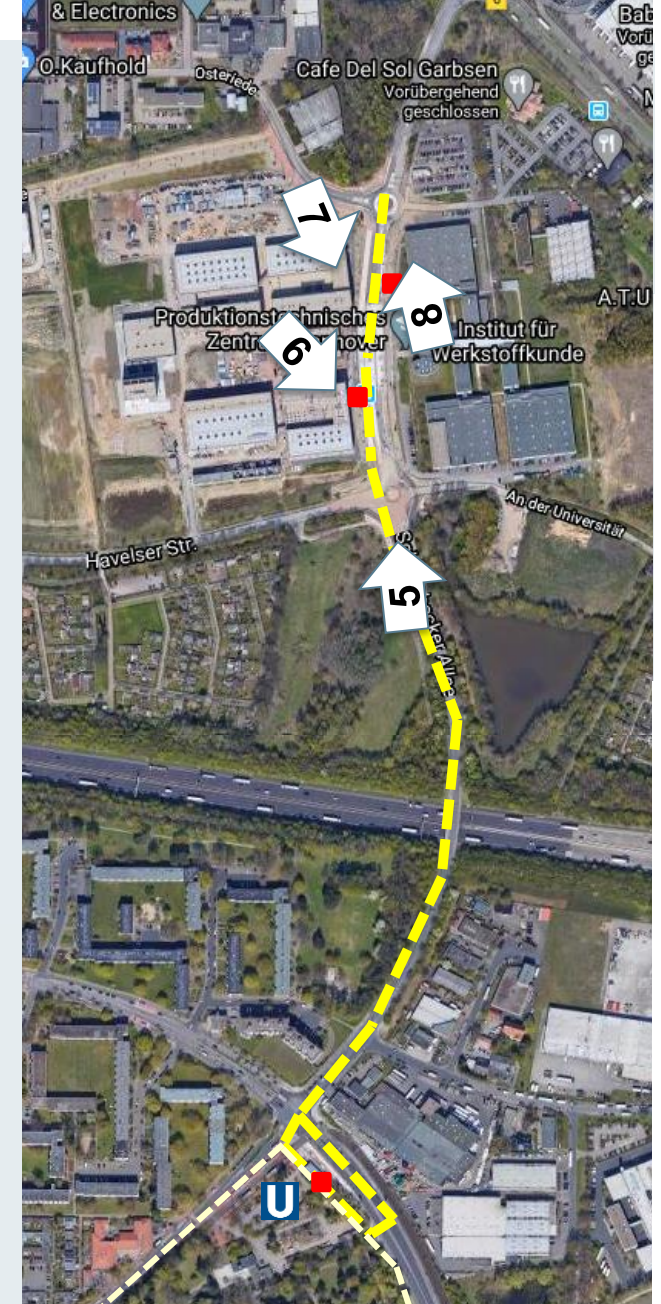
- Distance: 1 km
- Two busstops
- Normal traveltime 2 min
- Line frequency: every 10 min



The route

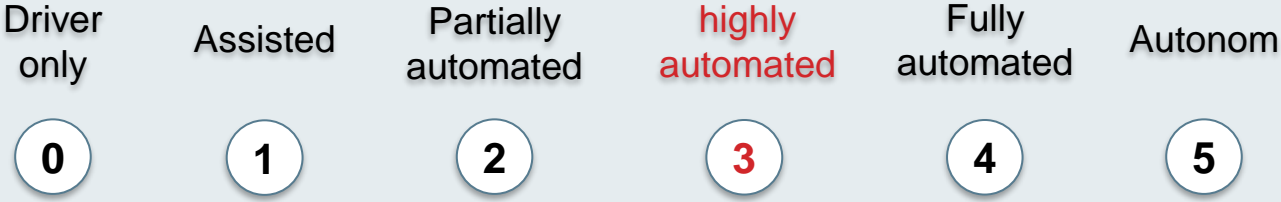


The route





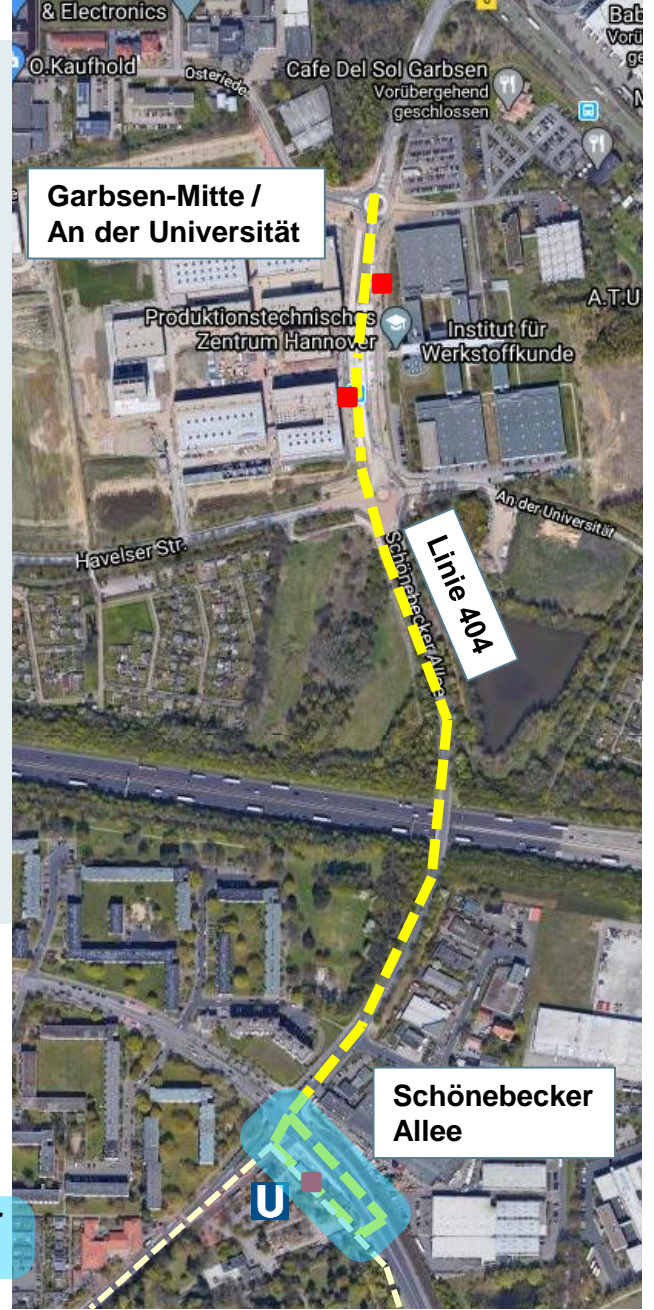
Driving Mode



- Travel time 12 min
- Speed 9-14 km/h
- Bus driver on board as security driver

Regular bus ran continuously at the same time on the line.

Manueller Modus



The vehicle...

- ... meets the criteria for level 4 automation (fully automated).
- ... is permanently monitored by an accompanying driver who can intervene in an emergency.
- ... has a purely electric drive.
- ... is barrier-free (electric ramp, push-button with two-senses principle, ...).
- ... has 6 seats.
- ... has already been approved once in Germany according to § 21 of the German Road Traffic Licensing Regulations (StVZO) and has been inspected and approved by TÜV/DEKRA (technical report).

Quelle: Beispielbild EM (verändert)

Summary

- Numerous **emergency stops** due to vehicles overtaking too closely
- Problems due to **green cuttings**
- **Capacity**: 6 seats is too small for public transport, no line in public transport is operated with 6 passengers
- **Speed**: the structure of bus depots needs to be completely rethought. The shuttle cannot go to a depot 8 km away at the end of its service. The speed difference on rural roads is too great.
- **Cleaning and maintenance** must take place on site.



Conclusion:

We will continue to work with autonomous technology.

There is an acute shortage of drivers, so the technology is going in the right direction.

There was a lot of interest in the vehicle. Especially the route to a technical research campus turned out to be very suitable.

But we need bigger and faster vehicles in public transport.

HANNOVER


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