H2020 — Avenue

Ride2Autonomy Workshop

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February, 2022

|—Information Security Group
|–Information Science Institute
|-Geneva School of Economics and Management
University of Geneva

Member of the Swiss Association for Autonomous Mobility

University of Geneva

UNIVERSITÉ DE GENÈVE

University of Geneva Founded in 1559 by Jean Calvin. With 19 000 students & 150+ different nationalities. Composed of nine faculties and supporting multiple centres and institutes.

Geneva School of Economics and Management. The faculty is committed to a broad-based, multidisciplinary approach to the sciences of economics and management and is host to several institutes.

Information Science Institute. Hosting seven Laboratories.

- 30 staff members, 25+ active research projects
- Computer Graphics & Animation, Services for seniors, Geolocalisation, Cloud computing, Ecosystem of Services, Autonomic Systems, Privacy, Security, Services and Applications’ Integration, Mobile systems and services
- Interdisciplinary approach to the systematic innovation in service systems.
- Large, international scientific and commercial partners’ network
- Located at the Intrafaculty Computer Science Centre CUI (Batelle campus).

AVENUE

A 4 year's project with mission to: Prepare the adoption and deployment of Automated vehicles for public transportation.

To seek out **new transport paradigms** and new business models. To boldly test **disruptive public transport services** which no autonomous vehicle has done before!

20 Partners — 7 sites — 20M EUR budget — 15.4M EUR EU Contribution.

1 May, 2018 — 31 October, 2022

https://h2020-avenue.eu/

www.youtube.com/AvenueH2020project

https://cordis.europa.eu/project/id/769033

Avenue — Deployment sites

- Geneva — TPG

  September 2018 — December 2020 Meyrin: regular service, 2 Autonomous Vehicless (AVs)

  Since Sept. 2020 — Belle-Idée

  On-demand, door-to-door, fleet of 3+1 AVs

- Copenhagen — Amobility (Holo)

  May 2018 — Oslo, Gothenburg — 3 AVs

  Fall 2020 — january 2021 — Nordhaven

  On-demand — 2 to 4 AVs, fixed route

  Since September 2021 — Slagelse

  On-demand, door-to-door service, — 2 AVs

- Lyon — Keolis

  Since May 2018 — Regular service at Confluence — 2 AVs

  Since November 2019 — Parc Olympique Lyonnais stadium

  Complex roads, hi-speed traffic, V2X — 2 AVs, Line N1

- Luxembourg — Sales-Lentz

  Since September 2018 — Pfaffenthal — 2 AVs

  Since Summer 2020 — Contern

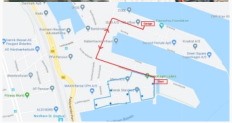
  Complex road, link to train services, on-demand — 2 AVs

  Since October 2021 — Esch-sur-Alzette

  To evolve to on-demand, door-to-door service — 2–4 vehicles

- Sion — PostAuto Since May 2021 — Uvier — 2 AVs + conventional bus

  On-demand, intelligent bus stop



Avenue — target

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Deploy Autonomous/Automated (SAE level 4, 4+) Vehicles for regular **commercial public transportation** services.

On-demand, Door-to-door public transportation service

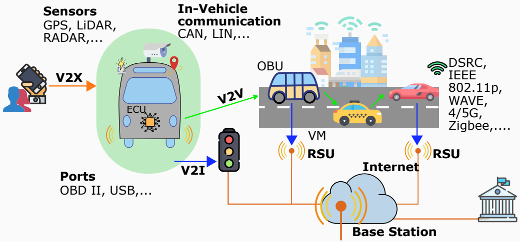
We are **NOT** targeting a “simple” fixed root, **BUT** on-demand bus-stop service.

We are **NOT** targeting a test deployment **BUT** a full regular, commercial service

We are **NOT** targeting an operator based vehicle, **BUT** a service with no operator intervention.

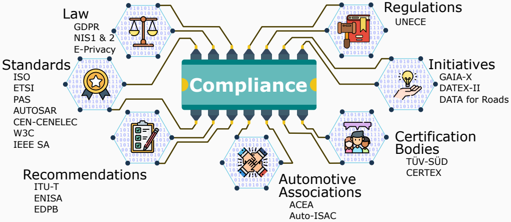
Automated minibuses eco-system

- Development, Adaptation and integration of Passenger Transport and in-, out-of-, vehicle services
- Command-Control-Communication system
- Safety, Security and resiliency evaluation



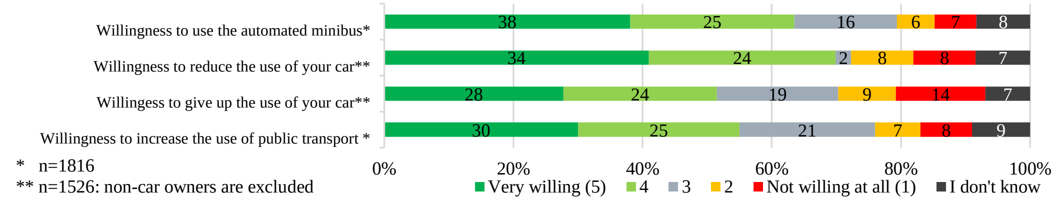
Stakeholders, adoption and regulations

- Autonomous vehicles for public transport demonstrators
- Socio-economic and environmental evaluation
- Transition Roadmap for Autonomous Vehicle public transportation



Study on needs and attitudes to evaluate social acceptance

Survey conducted in all four AVENUE demonstrator cities[1]: Copenhagen (n=491), Geneva (n=284), Lyon (n=501) and Luxembourg (n=540)

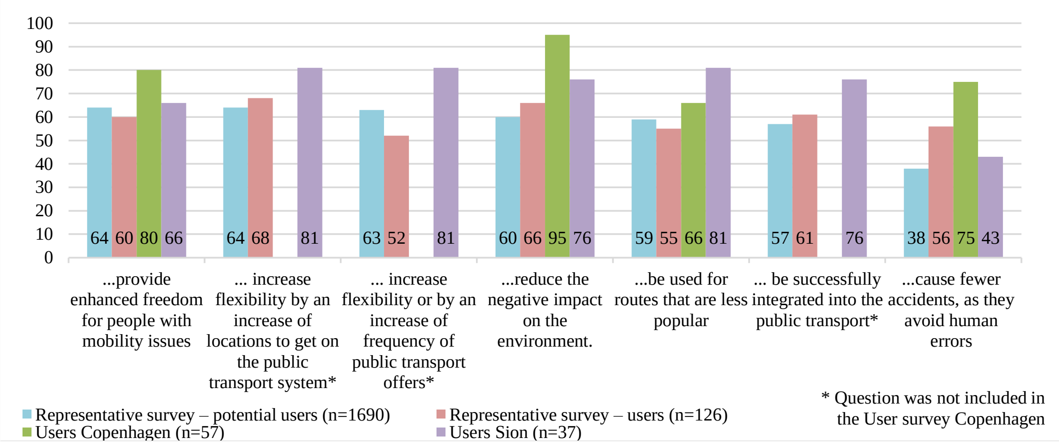


Positive attitudes prevail, even though only 55% of the respondents had previous knowledge on AM, and only 7% (126 respondents) had previous experiences with AM. There is a high willingness to use the AM services. Moreover, the AM is seen as a possible alternative to car use.

- A third of the respondents are very willing to reduce the use of their car, and
- A fourth is very willing to give up the use of the car.

[1] Dorien Korbee, Gabriele Naderer, Guy Fournier; the potential of automated minibuses in the socio-technical transformation of the transport system; Transport Research Arena Conference 2022

The majority of the respondents (both potential users and users) agree with statements that the deployment of AM will improve the public transport system in the sense of enhanced freedom and increased flexibility. These positive expectations are the main drivers for willingness to use:



Belle-Idée — Avenue — TPG

Autonomous Vehicles to Evolve to a New Urban Experience

www.h2020-avenue.eu

Belle-Idée — Overview

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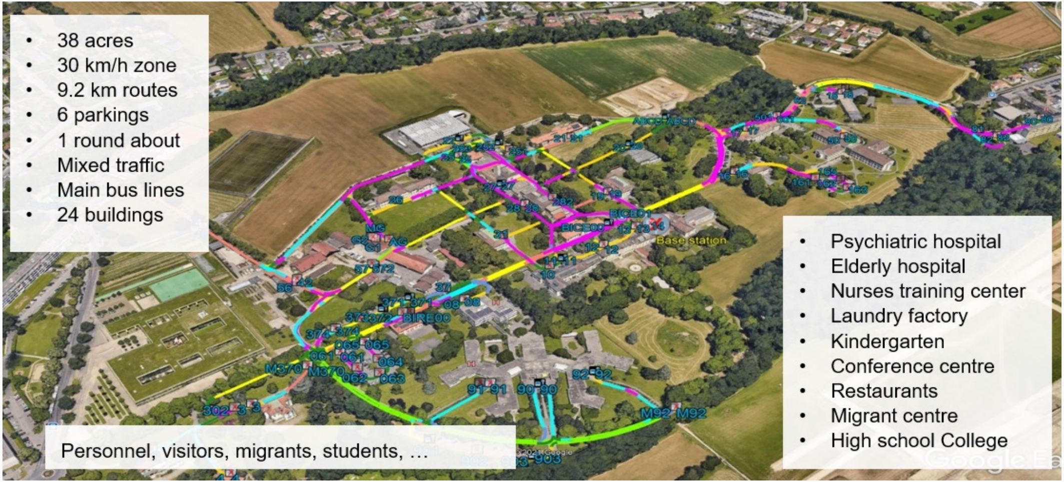

- 38 acres
- 30 km/h zone
- 9.2 km routes
- 6 parkings
- 1 round about
- Mixed traffic
- Main bus lines
- 24 buildings

- Psychiatric hospital
- Elderly hospital
- Nurses training center
- Laundry factory
- Kindergarten
- Conference centre
- Restaurants
- Migrant centre
- High school College

Personnel, visitors, migrants, students, …

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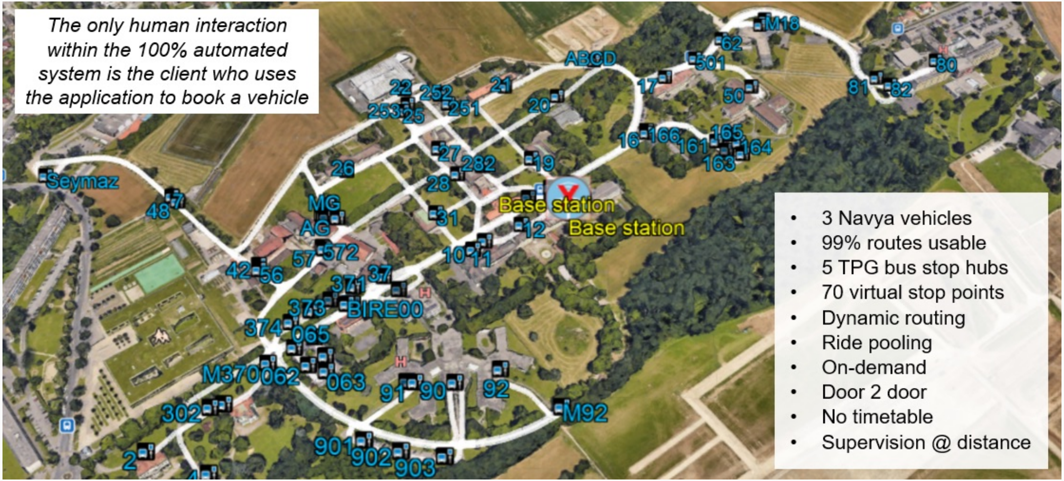
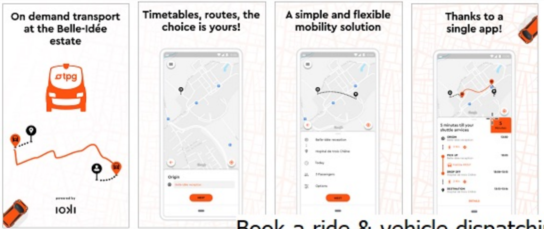


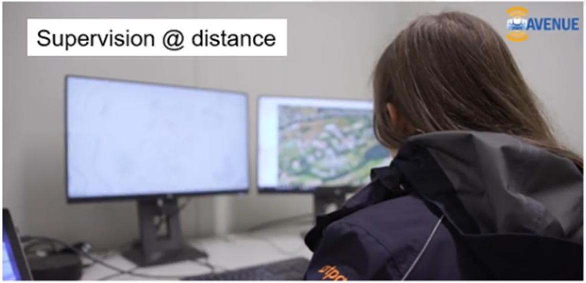
The only human interaction within the 100% automated system is the client who uses the application to book a vehicle

- 3 Navya vehicles
- 99% routes usable
- 5 TPG bus stop hubs
- 70 virtual stop points
- Dynamic routing
- Ride pooling
- On-demand
- Door 2 door
- No timetable
- Supervision @ distance

Belle-Idée — Services & Monitoring



Book a ride & vehicle dispatching



Belle-Idée — Services

Belle-Idée — Fully Automated

- Advanced dynamic ride pooling
- Innovative passenger services testing
- Automatic induction charging vehicles
- Activation of electric garage doors by vehicle
- Able to remove safety operator from vehicle

Questions?

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