



An European urban transition project towards more sustainable cities through innovative solutions, in the fields of mobility, energy and digital.

Smart City

Global project

Coordination: Cartif
European grant: 18 M€
30 partners, 6 countries
Period: Dec.2016 - Nov.2021
Demonstrators: Nantes, Hamburg, Helsinki

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<https://mysmartlife.eu/>

Nantes demonstrator site

Coordination: Nantes Métropole
European grant: 4,5 M€
10 partners

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Mobility



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ACTION OVERVIEW



Autonomous shuttle bus

This action was implemented by Nantes Métropole, Semitan and a consortium of partners. A full report (D2.13), written in English in November 2019, is available at: <https://mysmartlife.eu/publications-media/public-deliverables/>.

► OBJECTIVES

- › Testing an autonomous vehicle in real traffic
- › Contribute to the development of new technologies
- › Test the integration of innovative technologies allowing autonomy on three levels

► IMPLEMENTATION



CHALLENGE / CONTEXT

Urban mobility is a major challenge for cities. They must respond to differentiated needs and provide appropriate solutions for today and tomorrow.

As part of the Nantes City Lab project, Nantes Métropole and Semitan wanted to experiment with the implementation of an autonomous shuttle in real-life situations (immersion in traffic, pedestrian crossings, roundabouts, traffic lights) over a 2.5 km route in order to analyse the constraints and potential of this type of solution.

SOLUTIONS

The solution is to integrate different technologies for autonomous and green mobility. It aims at autonomy on three levels (driving, energy, perception of the environment) and is based on the following technical solutions:

- **An autonomous shuttle:** Produced by Navya in France, and 100% electric, it runs on battery power and is recharged directly from the electrical grid. It can carry up to 15 people. Its high-performance guidance systems use several technologies simultaneously (lidar, stereovision camera, GNSS base, odometry, etc.).

- **A solar route:** developed by the Charrier company, it helps to cover the shuttle's energy needs. The solar panels are thin, flexible and simple to install and remove. They are also resistant to the passage of bicycles and pedestrians. The panels produced nearly 130kwh per m² per year.
- **A device for communication with the environment:**
 - The shuttle can detect its environment (other vehicles, cyclists, and pedestrians) with sensors.
 - Moreover, the V2X solutions proposed by LACROIX City allow the shuttle to communicate in real time with its environment (equipment such as lights,...), in order to secure the shuttle, adapt its speed and guarantee the safety of the users passing nearby. The experimentation goes as far as the automatic camera detection of passengers present at stops and the detection of passenger calls.

MONITORING

An evaluation, piloted by Cerema, was carried out with a particular focus on the social acceptability of the autonomous shuttle, using different methods: online or on-site questionnaire, with users or non-users, interviews with the supervisors of the autonomous vehicle, etc. A camera analysis of the reactions of cyclists, pedestrians and vehicles when approaching the shuttle was also carried out. Full evaluation report : https://mysmartlife.eu/fileadmin/user_upload/publications/ATEC2020-evaluation-navette-autonome.pdf

The main performance indicators (KPIs) of this action are: energy consumption, CO2 avoided, number of kilometres travelled, number of passengers.

These indicators will be aggregated with those of all the actions of the Nantes-based mySMARTLife demonstrator in order to give a consolidated result of the overall impact of the project.

► BENEFITS

Environmental

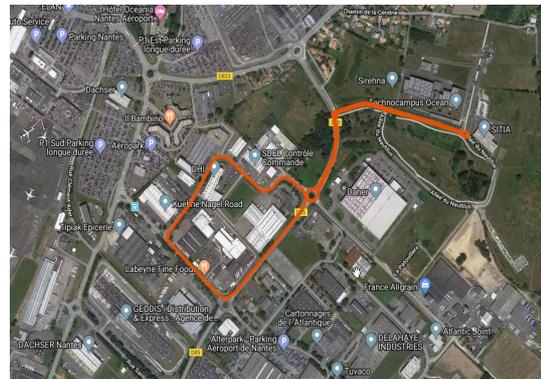
- › A 100% electric and green shuttle, by reinjecting the energy from the solar road into the grid.
- › An electric autonomy of 170km (without noise, without CO2 emissions).

Technical/economic

- › Testing of different technologies and full-scale tests

Users and inhabitants

- › Provision of public transport service in an underserved area



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