Aveiro Tech City Challenges

Aveiro Tech City Living Lab

AVEIRO TECH CITY LIVING LAB

The Aveiro Tech City Living Lab (The Aveiro Tech City Living Lab (https://www.aveirotechcity.pt/pt/atividades/aveiro-tech-city-living-lab) covers the entire city of Aveiro, supported by an infrastructure network of optical technology and radio network, connecting more than 40 radio units and about 16Km of fiber. The network provides short and long range communications (5G, LoRa, Wi-Fi, V2X - Vehicular to everything), mobile and fixed sensors for data collection (such as environmental sensors, mobility sensors, Lidars, Radars and video cameras) and advanced computing units, covering the urban area of the city of Aveiro. These units are distributed throughout the city of Aveiro through two types of fixed structures (in 44 locations): on poles designed to integrate this technology and in building facades.

The infrastructure of Aveiro Tech City Living Lab includes a set of equipment installed in the urban center, which allow a set of monitoring or interaction functions with users, for example:

- Experimental telecommunications antennas 5G, LTE/UMTS, Lora, Point-to-point connections of microwaves, Wi-Fi, ITS-G5 and C-V2X (for communication with people, sensors, cars, among others)

- 20 Environmental Stations, for measurement of air quality, noise and meteorological conditions

- Mobility sensors

- Radars and LiDARs (Light Detection And Ranging) in key areas of the city

- Smart seats

- Smart breaking lights for individual bicycles

- 22 Bike-sharing stations with wi-fi network of the new BUGA system – public system of bicycles sharing in the City of Aveiro [to be operationalized in 2022]

- Wi-Fi antennas

- 10 electric charging stations for maritime-tourist vessels in the city's urban channels [to be operationalized in 2023]
- Smart parking sensors installed in periphery parks around the city.
- Connected Autonomous mobility systems.

This living lab is available to research centers, companies and universities, so that they can develop, test and validate innovative concepts, new products and services, assuming itself as an ecosystem of open innovation, with a set of services available.

The open radio communications network enables a wide variety of tests, such as:

- Systems testing, allowing the installation of new equipment in the network terminals, which will be interconnected and connected to a central system through a fiber optic network;
- Testing applications for city managers and citizens;
- Monitoring at various levels, such as radio spectrum used in the territory, environmental, mobility;
- Testing of reactive solutions for the improvement of the city, in the areas of the environment, energy and mobility, such as for the prevention of accidents on the road.
- Interactive mobility, allowing the integration of new vehicular sensors.
- Access to city data, its services, citizens, weather conditions, etc.
- Autonomous mobility, for autonomous and multimodal driving.
- Critical and emergency scenarios in cities
- Smart parking

The communications infrastructure also includes a 5G network, covering the city's urban area, which provides 5G communications in non-standalone (NSA) and standalone (SA) mode to projects and end users, using a 5G core managed by Altice Labs. Also within the scope of the Aveiro Tech City Living Lab, 10 Aveirobus buses and 3 Veolia trucks are equipped with environmental and mobility sensorization units and communication units. Through these units it is possible to obtain a map of the city and the various roads at the level of environmental sensorization (temperature, humidity,

pressure, pollution, noise, among others) and other mobility parameters (speed, acceleration, braking, among others), to detect congested and/or dangerous areas.
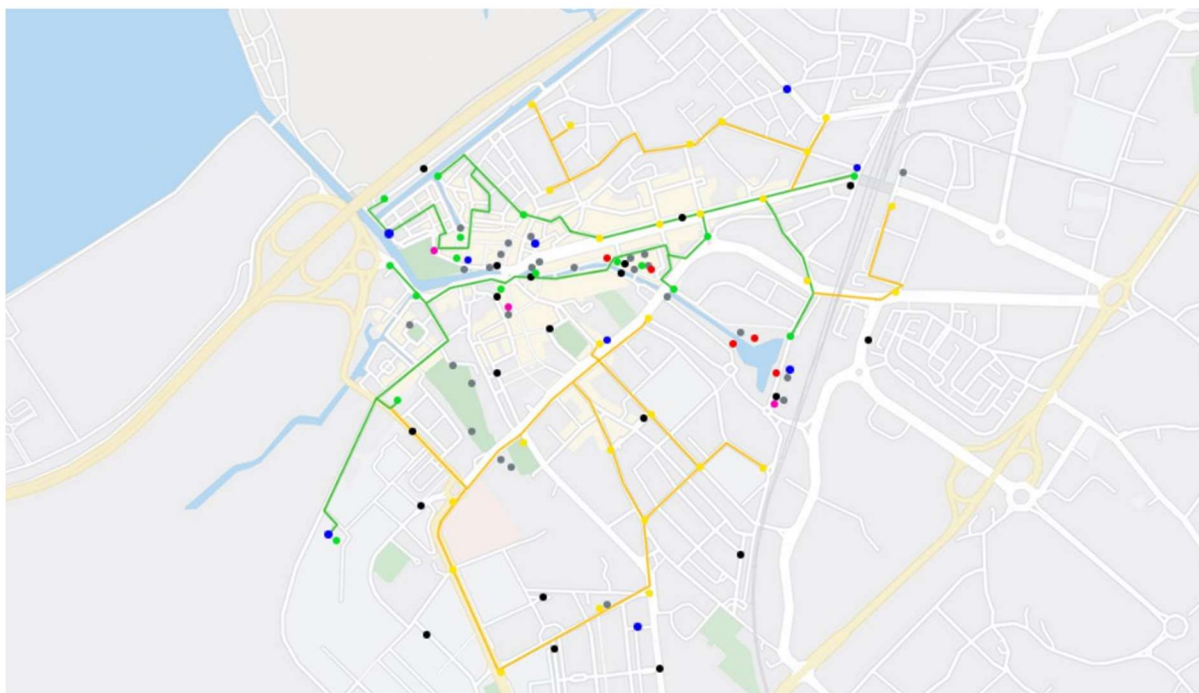
Aveiro Tech City Living Lab

Legenda:
- ● Antenas - Fase 1
- ● Antenas - Fase 2
- ● Estações BUGA
- ● Sensores Ambientais UA
- ● Antenas WiFi
- ● Bancos Conectados
- ● Mupi Digitais