Automated Vehicles

The TRL Living Lab has two Autonomous Vehicles available for hire. Both are converted Nissan eNV200 vehicles using the open source Autoware software platform.

The system has been designed to allow clients access to all data outputs the vehicle offers offering a powerful system for autonomous driving testing and advanced data collection. The vehicles are modular allowing clients own sensors to be integrated within the system to allow testing and validation of individual sensors using the platform.

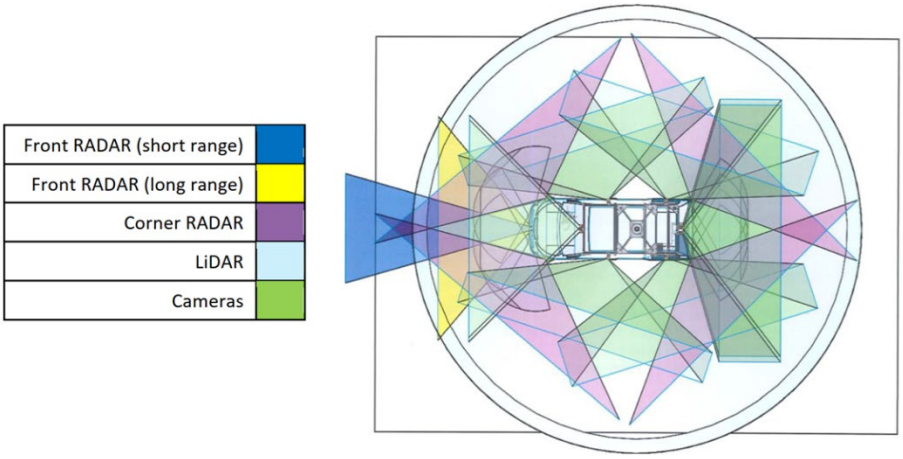
An array of sensors and compute power are included on the vehicle, these features are described in more detail below.

Overview

Vehicle Platform – **Nissan E-NV200**	7 seater, large cargo space
	40kWh battery, fast charging, V2G capable
Drive-By-Wire System – STREETDRONE	Hardware integration and initial ADS implementation provided by StreetDrone
Automated Driving System – Autoware	Established Open-Source Platform
	Validated on-road automated driving (limited ODD)
	Manually-driven data gathering
Key Hardware	Computation & Data Storage
	GNSS / IMU Positioning
	V2X, Wifi & Mobile Comms
	Stereo & Mono Cameras
	LiDAR
	RADAR

Automated Vehicles

Vehicle Sensor Coverage



Data Output Examples

Output type	Description
CANBus file	Data events as .csv Raw canbus as .stf or .log
ROSBAG file	.bag NB - Rosbag is the Robotic operating system output file which is to be loaded using the Autoware platform.
Forward and side cameras output videos	.svo, .bag, .mpg4 NB – the video resolution will need to be adjusted according to the GDPR Policy in place by the client
LiDAR point cloud data	Map file within .bag, can be extracted as .pcd
Video of Autoware output	Includes outputs from the LiDAR, radar, cameras

Automated Vehicles

Hardware Specification

Category	Item	Description
Platform	Vehicle Platform	Nissan E-NV200
	L2 DBW Kit with Installation	Control of steering, brake, throttle and ancillaries
	DBW ROS Interface	
Computation	Compute Hardware, Storage, Installation	NEOUSYS Nuvo-6108GC
Sensors	Universal Roof Rack System (A)	Flexible Sensor Mounting
	LiDAR sensor	Velodyne VLP32
	Stereo Camera Bumblebee	Bumblebee XB3 Stereo Camera
	Mono Camera Basler x 6	Basler monocular camera acA1920-155uc
	Smart Micro RADAR	SmartMicro RADAR system (1 x T132 and 4 x T146)
	GPS / IMU (OxTS)	OXTS RT3002Gv2 Series
	Ultrasonic sensor	Neobotix Ultrasonics with 8 x Bosch Parkpilot
Comms and Power	CAN Logger	GEMs CAN Logger
	Power Distribution Module (GEMs)	GEMs power management system
	Multiplexer	Multiplexer for CANbus access
	Teltonika RUT955 Router	Wifi/Cellular Router
Optional	V2X DSRC Radio	Cohda MK5 On-board Unit
	Cisco IR829 Router	Cisco IR829 Router

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Data Variable List

ADS		**Primary Sensors**
System status [engaged/disengaged/stealth]		Camera video (stereo x 1, mono x 6)
Autoware		LiDAR Pointcloud
Output from the Decision Making module		RADAR Pointclouds (x 5)
Output from the Localisation module		**Secondary Sensors**
Output from Detection module		Brake light illumination
Output from the Vehicle Interface		Brake pressure
DBW Instructions		Footbrake position
Steering angle demand		Headlight illumination
Torque demand		Horn
GEMS Power Management		Indicator illumination
System status		Steering angle
12V power draw		Throttle position
GNSS/IMU		**Vehicle CANbuses**
Acceleration (N, E, Altitude)		Battery State of Charge
Velocity (N, E, Altitude)		Door switches
Position (N, E, Altitude)		Gear selector position
Angular Acceleration (Heading, Pitch, Roll)		Vehicle speed
Angular Velocity (Heading, Pitch, Roll)		Wheel speed
Angle (Heading, Pitch, Roll)		
Time of day		

Where to find us

Address

Unit 7, 14 Victory Parade
Plumstead Road
Woolwich
London
SE18 6FL

Google Maps Link

Getting Here

Parking: The nearest public car park is Cannon Square Car Park located within the same development as the Living Lab

Tube: DLR Woolwich Arsenal

Train: NR Woolwich Arsenal

Airport: London City Airport

Click here to take a quick video tour of what's available at the Living Lab and how it is used.