

AutoAir: 5G Testbed for connected and autonomous vehicles



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The AutoAir project created a testbed with high data bandwidth around its track to trial the development of Connected and Autonomous Vehicles (CAV) at its proving ground, Millbrook. This also acts as a testbed to trial the potential use of 5G connectivity on roads and rail to tackle poor mobile coverage.

Key findings

AutoAir event at Millbrook Bedfordshire - photo credit Stuart Berman

The project developed the UK's only independent 5G-enabled infrastructure for CAVs.

The project deployed a hyper-dense small cell network using a 'neutral host' model using 4G, with O2 and a private network at Millbrook to share the same infrastructure, but using different networks. This was an important step forward towards providing alternative and cheaper connectivity solutions in future projects.

It successfully launched its 5G test network in February 2019, showing a transmission of live 4K video at 1Gbps from fast-moving vehicles, to a screen on a bus. This was achieved using 23 small cells that were installed on the site.

Having a small-medium enterprise company develop the hardware as part of the testbed's consortium helped stimulate and support the UK supply chain.

It is challenging and expensive to roll out 5G on roads and rail. This is why the 5G Programme is exploring this further in

our current projects, 5G Connected Autonomous Logistics (5G CAL) in Sunderland and 5G Logistics in Bristol.

Use cases

Infotainment Link to High Speed Vehicles: The project successfully demonstrated that 1.7Gbps data could be downloaded continuously using 5G's high throughput to a vehicle travelling at 120mph.

Infotainment Link Across Moving Vehicles: Continuous download data speeds of up to 36Mbps were also seamlessly linked to congested traffic and to three users travelling in the same vehicle at 50mph.

Communication with Autonomous Vehicles: Using Machine Type Communications (MTC) the project explored whether it was possible to transfer data between an autonomous vehicle and to infrastructure, with 6-9Mbps speeds were reached. Further research is ongoing in our current project to explore autonomous vehicles.

Reports

An Evaluation of the Transport Route Hyper-Dense Neutral Host Network and Business Model Insight - Stage 2 - A follow up to the first report, this document looks at the neutral host model with key recommendations.

More information can be found on the UK5G AutoAir page.

Project partners:

Airspan (Lead, 5NR, mmWave)

Dense Air (neutral host small cells)

Millbrook Vehicle Proving Ground

5G Innovation Centre, University of Surrey (5G NR Phy & Core)

VIAVI Solutions (manufactures testing and monitoring equipment for networks)

Celestia Technologies Group (5G antennas)

ARM (MEC nodes and technology)

Real Wireless (network planning, analysis)

Quortus Limited (core network)

Blu Wireless (mmWave mesh and access)

McLaren Applied Technologies (vehicle telematics)

Telefonica UK Limited

Atkins

Please find more information on the UK5G AutoAir page.

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