



NORTH EAST
**AUTOMOTIVE
ALLIANCE**



The North East Automotive Alliance (NEAA)

Vision

The North East Automotive Alliance will be the catalyst through which the North East becomes the location of choice for automotive investment in Europe.

The region will be recognised as a true automotive powerhouse which encompasses a very dynamic, forward looking, and competitive supply chain that incorporates strengths in research, development and innovation in new automotive technologies and manufacturing processes.

About the NEAA

- Established in March 2015
- Industry-led cluster
- Largest Automotive Cluster in the UK
- 278 member companies
- 10 industry working groups, 5 key thematic areas
- Industry representation on 15 regional, national and international industry boards





Continual drive for operational efficiency and increased competitiveness...



Indoor AGV

- In-house design, deployed since 2007
- Continual development and scale out
- 418 now in operation
 - 309 in logistics
 - 109 in process/assembly
- Further 150 planned for FY23



Outdoor AGV

- Multi route options identified
- FY16 – Market investigation – no available options that meet requirement
- POC APC/Innovate UK funded project
- FY18 – First deployment
- Proposed development of Alliance standard for roll out



Connected & Autonomous Logistics

- Private road built with automated logistics in mind
- Feasibility study identified £2.2m saving on Vantec routes
- Significant scale opportunities including:
 - 8 onsite "private road" opportunities
 - 8 suppliers within 2 miles
 - 9 supplier 2<30 miles



Our journey to on-road application

5GCAL - £4.9m POC



Successful proof of concept trial – delivering full loads in teleoperation mode and full autonomous mode

V-CAL - £8.1m CCAM



Scale up and scale out to deliver operational flexibility to match current state and expand capability to more realistic road infrastructure

Port Use Case



Expand into a more challenging and varied operational environment

NICCAL



Build capability and establish a National Innovation Centre for Connected and Automated Logistics, building on CAM Testbed UK and creating a testbed to design, develop and test CAL technologies.

2030 Grand Challenge



Delivery of finished vehicles from end of line to Port of Tyne. Circa 100 deliveries per day (1,200 vehicles).

Staged approach liaising with:



Centre for Connected & Autonomous Vehicles



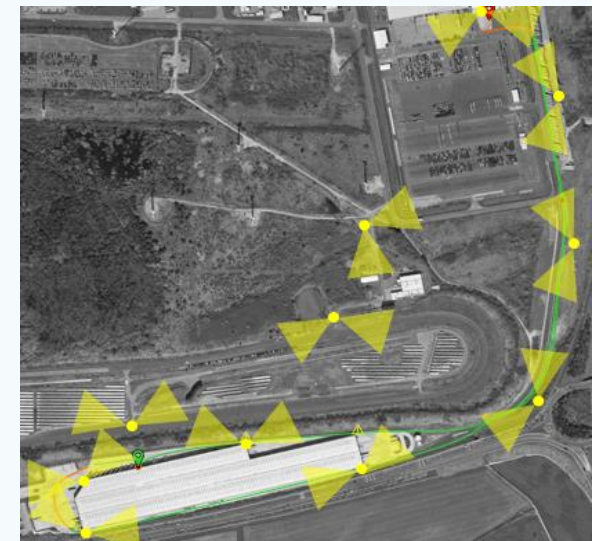
Innovate UK

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5G CAL

- £4.9M 5G Create Project
- 5G Infrastructure
- Autonomous system
- Teleoperation
- V2I
- Autonomous 40 tonne HGV
- Telecoms and Cyber Security



SUPPORTED BY



5GCAL Deployment Scenarios

CAL Implementation Scenarios

Stage 1: Contained Areas

Un-delineated terrain

Example Activities:

Mining – Agriculture –
Construction – Waste &
Recycling

Key Characteristics:

- No public interaction and limited interaction with site employees
- Wide range of operations
- Remote locations
- Some dangerous operations – presents automation safety opportunities
- Semi-automation already available and in use

Facts:

- 2,000 Mines & quarries in the UK
- 192,000 farms – 50% under 50 acres
- 4,300 waste & recycling plants

Delineated terrain

Example Activities:

Ports (freight) – Airports
(freight) – Distribution
Centres – Warehousing –
Manufacturing

Key Characteristics:

- Factories, warehouses & yards
- No public interaction, increased interaction with site employees & manual vehicles
- Repetitive, predictable journeys in definable areas suited to automation
- Strong industry appetite for automation

Facts:

- 120 UK cargo ports handle 440mn tonnes of freight annually via 82,300 vessels
- E-commerce driving 3% growth in warehousing and storage industry in 2021/22

Stage 2: Public Roads

Primary Delivery Routes

Example Activities:

Bulk Logistics – Hub to Hub
Transport – Plant to Plant
Deliveries (using public roads)

Key Characteristics:

- Initially short distance A-road use
- Limited initial exposure to public
- Minimal interactions and stops
- Longer-term sees CAL on motorways, with increased public exposure
- Widespread CAL driver upskilling required

Facts:

- 590,000 trucks on UK roads
- TuSimple has begun active operation of level 4 autonomous operation in the US

Wider Road Network

Example Activities:

Hub to Retail (suburban) –
Long Distance Freight

Key Characteristics:

- Motorway, A & B roads, some residential roads
- First CAL residential interactions with high exposure to public
- Predictable routes with unpredictable conditions
- Wide range of end point infrastructure & geography
- Significant public awareness now required

Facts:

- HGV's are 10% of motorway traffic but are involved in 52% of fatal accidents
- HGV's 5x more likely to be involved in a fatal accident on minor roads

Last Mile Deliveries

Example Activities:

Hub to Retail (urban) – Urban
to Urban – Courier – Parcel
Delivery – Food Delivery

Key Characteristics:

- Light freight and vans
- Intense public interaction
- E-commerce drives increasing sector demand
- Unpredictable routes, obstacles and road users
- Full automation requires additional tech; e.g. parcel drops, customer service
- Low public acceptance & industry appetite

Facts:

- Van traffic has grown by 74% since 1996
- 50% of urban traffic increases due to vans
- Forecast 22,000 van driver shortage in 2022

£8.1m CCAV Commercialising CAM



- 5G network
- 3 new fully electric yard tractors
- Autonomous system
- Teleoperation system with extended visualisation

Success Factors:

- Operational flexibility to match current state
- Integrating within operational conditions
- Remote driver supervision (1:3)
- Commercially viable systems



Supported by



Innovate UK



Centre for Connected & Autonomous Vehicles

ZENZIC²



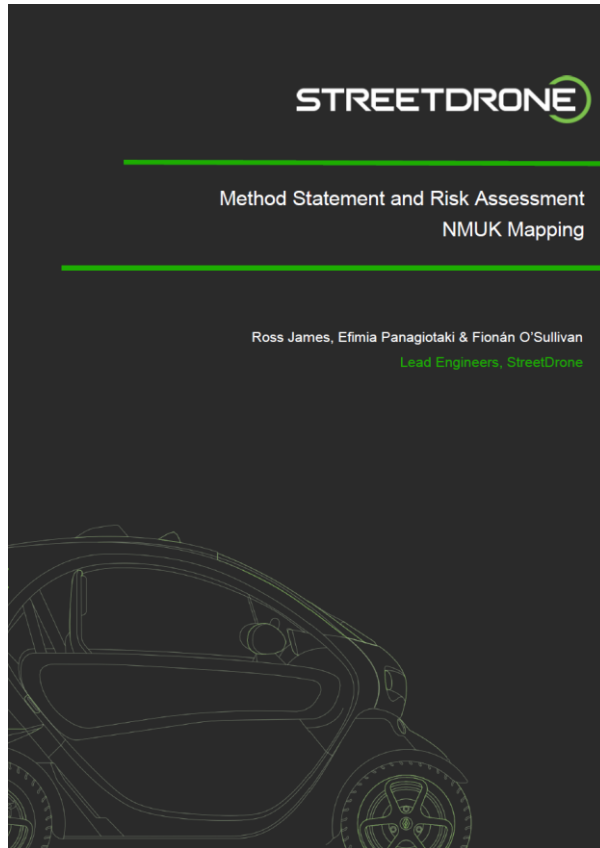
- Original 5GCAL vehicle
- Car transporter trailer
- Fully autonomous system

Success Factors

- Operational flexibility to match current state
- Integrating within operational conditions
- Ability to handle more complex road infrastructure:

V-CAL

Regulatory compliance in controlled environments



- Method statement and risk assessment
- Public liability insurance
- Vehicle insurance



Standards



The rapid advancement of automated driving technology is putting pressure on the industry to rethink [automotive safety standards](#)

[ISO 21434](#) safeguarding the future of automotive security

[BS ISO 21448](#) Road vehicles — Safety of the intended functionality

[PAS 11281](#) Connected automotive ecosystems. Impact of security on safety

[PAS 1883](#) operational design domain (ODD) of an automated driving system.

[PAS 1885](#) The fundamental principles of automotive cyber security.

[BS ISO 11270](#) Lane-keeping assistance systems (ADAS)

[BS ISO 15622](#) Adaptive cruise control systems (ADAS)

[BS ISO 11067](#) Curve speed warning systems (ADAS)

[BS ISO 15623](#) Forward collision warning systems (ADAS)

[BS ISO 19638:2018](#) Road boundary departure prevention systems (ADAS)

The logo for V-CAL, featuring the text 'V-CAL' in a bold, white, sans-serif font on a blue-to-teal gradient background.

On-road - One giant leap for mankind



Society and people - Vehicle approvals	Advanced trials approval				National approval scheme				International approval harmonisation																																							
	Local codes of conduct for services				Align with wider future of mobility				National licensing scheme for CAM Services				Agile and adaptive development of CAM service regulation																																			
Society and people - Licencing and use	Common risk and liability understanding				Data sharing				Changes in legislation				Insurance policy refinements and lower premiums																																			
	Establish skills Centre of Excellence and pipeline				Improvement of skills pipeline				Sustaining skills pipeline																																							
Society and people - Legislation and insurance	Common standards				Low complexity design domain				Medium complexity design domain				High complexity design domain																																			
	Safety data standards				Cooperative data sharing				Legacy fleet connectivity				Ubiquitous cooperative connectivity																																			
Society and people - Skills	Low cost, high precision sensor development				Deliver initial sensor validation methodology				Deliver full sensor validation methodology				Enhanced sensor development																																			
	Agree communications approach at a national level				Plan coverage and rollout				Deploy CAM road safety infrastructure				High connectivity across the road network																																			
Vehicles - Automated driving system	Define data governance and ownership				Develop virtual road environments for CAM				Deploy virtual road environments for CAM				National operational data hub				Virtual road environments for operational management																															
Vehicles - Connectivity	New planning and investment guidance				Digitisation of signage assets				Digitisation of road rules				Repurpose infrastructure																																			
Vehicles - Sensors	Understand new travel demands through trials				Define new operational models				Deploy new operational models				Increase network efficiency																																			
Infrastructure - Communications	Cyber centre of excellence				Deploy virtual test environments				Develop automated validation				Refresh CAM Testbed UK																																			
Infrastructure - Digital	Low complexity trials				New freight policy developments				Small scale deployments				Last mile CAM delivers productivity benefits				Integrated services CAM more attractive than traditional services																															
Infrastructure - Roads																																																
Infrastructure - Intelligent network management																																																
Infrastructure - Test and development																																																
Services - Freight and logistics																																																
	2019				2020				2021				2022				2023				2024				2025				2026				2027				2028				2029				2030			

5GCAL policy recommendations



The driverless road ahead for logistics:

Realising the Connected Autonomous Logistics (CAL) opportunity



Summary of key recommendations:

1. The UK's Vehicle Certification Agency should work with stakeholders and industry to define a **fast-track pathway towards type approval** for CAL vehicles.
2. The Government should **enhance public investment in public 5G and 6G infrastructure** to ensure CAL vehicles can access resilient, high-quality and low latency communications.
3. The Government should continue to **expand the UK's cyber-security capabilities**, to ensure that CAL vehicles can operate safely in light of emerging threats such as the development of quantum computing.
4. The Government should commit to **further R&D investment** to help drive further innovation in the region **to create end-to-end integrated business models and systems**.
5. Develop **new qualifications** to support the **development and/or operation of CAL technology**, including in cyber-security software engineering, and tele-operation of CAL vehicles.

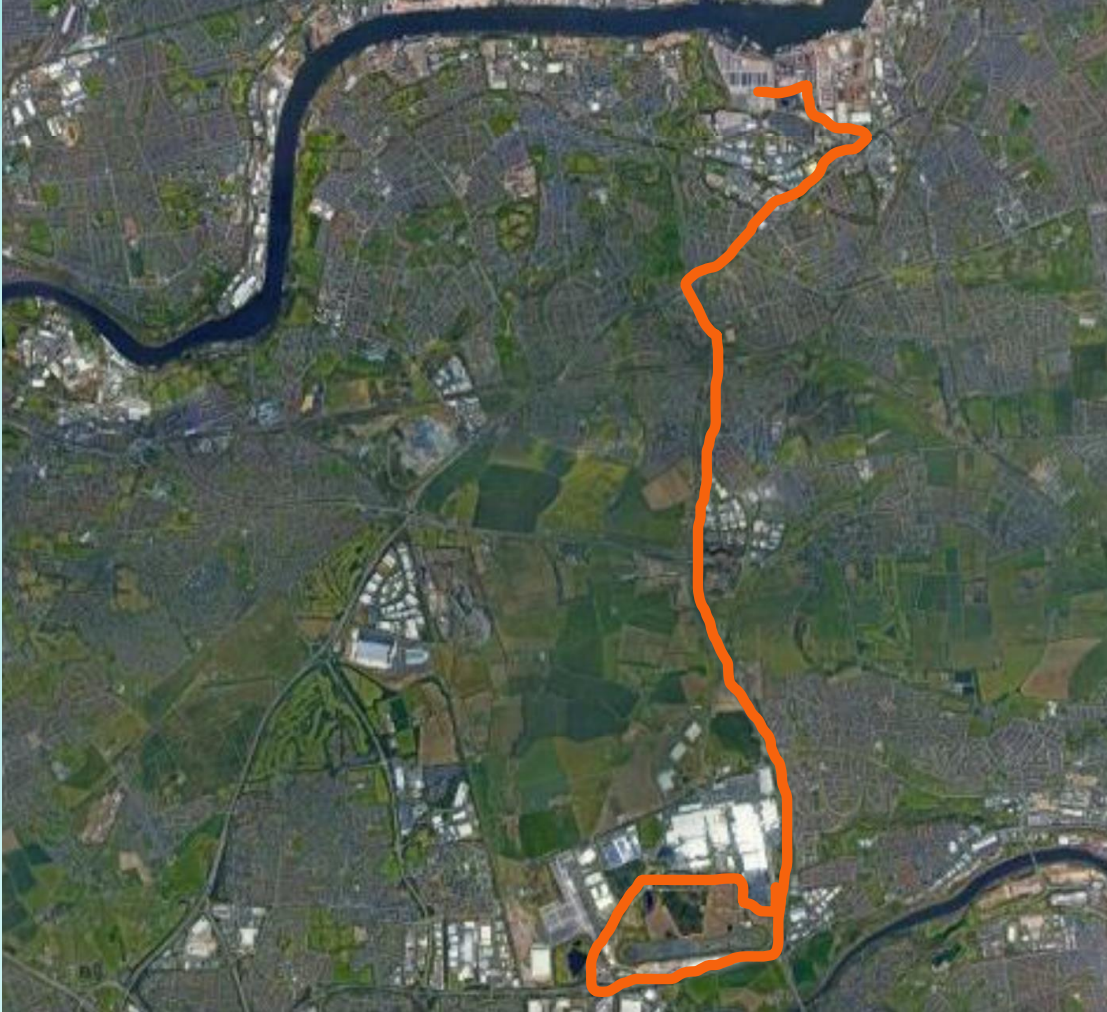
Law Commission: Automated Vehicles



75 key recommendations covering 17 areas:

1. A new automated vehicles act
2. Test for self-driving
3. Activities by user in-charge
4. Unwitting take-over
5. Secretary of state's safety standard
6. Pre-deployment safety assurance
7. In-use safety assurance
8. Forum to collaborate on road rules
9. Collision investigation
10. Cybersecurity
11. Marketing driving automation
12. Role of user in-charge
13. NUIC operator licensing
14. NUIC passenger services
15. The duty of candour
16. Wrongful interference
17. Civil liability

Our journey to on-road application



Grand Challenge 2030

- Autonomous delivery of finished vehicles to the Port of Tyne ready for export
- Circa 100 deliveries per day (1,200 vehicles)
- Teleoperation system
- Inc digital trade
- V2I

Success Factors

- Operational flexibility to match current state
- Integrating within operational conditions and public roads
- Public acceptance

Thank You for Listening

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