Centre for Connected
& Autonomous Vehicles

Innovate UK

Competition for funding

Connected and autonomous vehicles 2

**REGISTER BY
2 NOVEMBER
2016**

Connected and autonomous vehicles 2

The Centre for Connected & Autonomous Vehicles (CCAV) is to invest up to £30 million, and Innovate UK £5 million, in industry-led research and development projects on connected and autonomous vehicles.

Projects need to come up with technical solutions for connected and autonomous vehicle features that provide real-world benefits to users. This includes how these vehicles will work as part of a wider transport system. We are seeking proposals where the commercial benefit is clear.

This competition is in four streams.

Stream 1 will fund a large-scale challenge to develop and demonstrate a vehicle operating at SAE level 4 automation.

We expect to fund either a single project or 2 projects maximum. We expect projects to have total costs of £15 million to £30 million. Projects should last between 18 and 30 months.

Streams 2, 3 and 4 will fund feasibility studies and industrial research and development projects on connected and autonomous vehicles.

We expect projects to range in size from total costs of £250,000 to £5 million. Projects should last between 12 and 30 months.

All projects must be collaborative and a business must lead the project.

The competition opens on 22 August 2016.

You must register before noon on 2 November 2016.

You must apply before noon on 9 November 2016.

Attend the briefing event here: https://ccav-competition-smmt-forum.eventbrite.co.uk

Register and apply online.

Not right for your innovation project? View other Innovate UK funding competitions at: **https://www.gov.uk/government/collections/innovation-grants-for-business-apply-for-funding**.

1. Dates and deadlines

Competition opens	**Monday 22 August 2016**
Briefing event for applicants	**Thursday 8 September 2016**
Registration deadline	**Noon on Wednesday 2 November 2016**
Application deadline	**Noon on Wednesday 9 November 2016**

2. The competition scope

The aim of this competition is to come up with technical solutions for connected and autonomous vehicle features that provide real-world benefits to users. This includes how these vehicles will work as part of a wider transport system. We are seeking proposals where the commercial benefit is clear.

The competition is split into four streams.

Stream 1

We are looking to fund a large-scale challenge to develop and demonstrate a vehicle operating at SAE level 4 automation ('high automation'). For details of SAE levels, see: **http://www.sae.org/misc/pdfs/automated_driving.pdf**.

Projects **must**:

- develop and demonstrate a vehicle completing an end-to-end SAE level 4 journey (at least 10 miles) on public roads. The vehicle must operate safely in a live traffic environment on a mix of UK public roads, and cover urban and inter-urban travel

- undertake this demonstration in a variety of conditions. Examples include different seasons, times of day (daytime and night-time) and good and bad weather (such as rain or fog)

- demonstrate some aspect of zero-occupant driving capability as part of the journey (for example, on-demand pick-up)

- undertake rigorous vehicle and system testing before you take the vehicle on public roads. This should include cost-efficient and innovative verification and validation procedures, plus the full safety case

- integrate security by design and demonstrate a rigorous assessment of cyber threats and vulnerabilities. This includes proportionate mitigations to potential threats

- consider how the vehicle will operate as part of a transport system, and how it helps meet the needs of the trial area

- show a clear route to market and revenue in the near term

Also, projects **may** develop and demonstrate:

- technology to enable the vehicle to operate in a closed environment as an intermediate step. This could apply to a business need such as autonomous freight movement

- vehicle to everything (V2X) connectivity including through interaction with other vehicle(s) and/or road infrastructure. This should support new business opportunities, such as fleet learning and data sharing, infotainment, alternative vehicle use etc

- business models, including potential data models and monetisation of possible new services resulting from this technology

- the application of appropriate human–machine interaction software

- the application of machine learning and artificial intelligence

- appropriate navigation/mapping capabilities and/or algorithms for the chosen route

- solutions for fleet operations, refuelling, back-to-base service and maintenance of a vehicle

You must have the support of key authorities in the trial area (for example, local authorities, road operators).

We expect projects to be primarily industrial research. Some work packages may be experimental development.

Streams 2 and 3

We are looking to fund industry-led collaborative research and development (R&D) projects and technical feasibility studies. These projects should focus on **one or both** of the following areas:

- connectivity

- autonomy

Stream 2

Collaborative R&D projects should focus on business opportunities or real customer problems. The aim is to support concepts that will become future core technologies in around 2020 to 2025.

The competition is open to all projects on one or both of the themes of connectivity and autonomy. But, we have identified priority areas for UK capabilities and global opportunities in connected and autonomous vehicles. These are:

- cyber security of data and vehicle systems, with the principle of security by design and privacy by design

- real-time control systems, data management and manipulation to drive decision-making

- machine learning and artificial intelligence

- application of appropriate human–machine interaction software

- innovative business models using connected and autonomous vehicle technology. In particular, models generating revenue in the short term (within 5 years of project completion)

We may adopt a portfolio approach to prioritise projects in these areas subject to quality criteria.

Projects **must**:

- focus on on-highway vehicles or POD (L, M or N category vehicles) as their primary exploitation route. Secondary exploitation through off-highway vehicles (non-road mobile machinery) is in scope as long as it contributes to on-highway capability

- include a final report and a dissemination plan

- show a clear route to market. One way is to include an end customer in the consortium

- support the principle of shared learning with other projects. This will include workshops, organised every 6 months by Innovate UK and CCAV.

We prefer projects that deliver proof of concept demonstrators to aid exploitation as part of the industrial research.

We expect projects to be either industrial research or experimental development, depending on the project aims.

Stream 3

Technical feasibility study projects should apply innovative thinking to real-world problems. At the end, projects should be ready to continue into future collaborative R&D competitions. Or they should be able to raise private sector investment to take the technology to market.

Stream 4

We are looking to fund collaborative R&D projects that can deliver results within 1 year.

Projects should focus on **one or more** of the following priority areas:

- connected powertrain for more efficient energy use

- autonomous control for more efficient energy use

- business model innovation and trialling through growing supply chain relationships in the UK

The aim of this stream is to fund projects to develop products, services and business models that provide energy reduction and air quality improvements. These improvements should come from the vehicle and energy infrastructure as a system. You must achieve this using connected and autonomous vehicle technology. Projects should also focus on how to bring these products and services to market.

Projects may be a combination of desk-based research, lab demonstration and on-vehicle demonstration. Projects that do not include on-vehicle demonstration must show a clear route to market. The end customer must be able to show the business case for on-vehicle demonstration.

Projects must focus on on-highway vehicles or POD (L, M or N category vehicles) as their primary exploitation route. Secondary exploitation through off-highway vehicles (non-road mobile machinery) is in scope. But the majority of the project should focus on on-highway vehicles or PODs.

We expect projects to be technical feasibility studies, industrial research or experimental development, depending on the project aims.

3. Projects that we won't fund

In this competition we are not funding projects covering other modes of transport outside the automotive space. Non-automotive applications (for example rail, marine etc) are not in scope.

Costs for the supporting systems required to enable vehicle technology are eligible. But projects where infrastructure or supporting systems are the primary cost are not in scope.

4. Find out if you are eligible to apply

To be part of a project, you must:

- carry out your project in the UK
- work in collaboration with others (for example businesses, research organisations and third sector)

5. Funding and project details

We have allocated up to £35 million to fund innovation projects in this competition. This is divided up as:

- £15 million to fund a large-scale challenge in Stream 1 (1 or 2 projects maximum)
- £15 million to fund projects in Streams 2 and 3
- £5 million to fund projects in Stream 4

We may move funding between streams to ensure that we distribute funding across the priority areas.

All projects in all streams must be collaborative and a business must lead the project.

We welcome non-UK-based partners in consortia, but grant funding is only available for UK-registered organisations and projects that take place in the UK. Please consult the *Guidance for Applicants* for the full rules.

Project types

For Streams 1, 2 and 4 of this competition, your project may focus on industrial research or experimental development. For Stream 3, projects should focus on technical feasibility studies.

For technical feasibility studies and industrial research, you could get:

- up to 70% of your eligible project costs if you are a small business
- up to 60% if you are a medium-sized business
- up to 50% if you are a large business

For experimental development projects which are nearer to market, you could get:

- up to 45% of your eligible project costs if you are a small business
- up to 35% if you are a medium-sized business
- up to 25% if you are a large business

To find out if your business fits the EU definition of an SME see: **http://ec.europa.eu/growth/smes/business-friendly-environment/sme-definition/index_en.htm**

Stream 1

We expect the successful project(s) to last 18 to 30 months. We expect total project costs of £15 million to £30 million. We may consider costs outside these ranges.

Stream 2

We expect projects to last 18 to 30 months. We expect them to range in size from total project costs of £500,000 to £5 million. We may consider costs outside these ranges.

Stream 3

We expect projects to last 1 to 2 years. We expect them to have total project costs of up to £250,000. We may consider costs beyond this.

Stream 4

We expect projects to last up to 1 year. We expect them to range in size from total project costs of £250,000 to £3 million.

6. How to apply

To apply:

- register online
- read the *Guidance for Applicants* for this competition
- attend the briefing event for potential applicants at Congress Centre, London, on 8 September 2016 (in person or by webinar) (**https://ccav-competition-smmt-forum.eventbrite.co.uk**)
- complete and upload your online application on our secure server

We will not accept late submissions. Your application is confidential.

An independent panel of experts will assess the applications and select the highest-quality projects.

Read the general *Guidance for Applicants* before you apply. It will help your chances of submitting a quality application.

7. Background and further information

The Centre for Connected & Autonomous Vehicles (CCAV) is a joint policy unit set up by the Department for Business, Energy & Industrial Strategy and the Department for Transport. CCAV was established to help ensure that the UK is a world leader in developing and testing connected and autonomous vehicles. It aims to achieve this in part through £100 million of funding (match-funded by industry). This is to support industry-led research and development over 5 years.

If you want help to find a project partner, contact the Knowledge Transfer Network at **http://www.ktn.uk.co.uk**

If you need more information, contact the competition helpline on 0300 321 4357 or email us at **support@innovateuk.gov.uk**

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