Transport Technology Research Innovation Grant (T-TRIG)
Grant Specifications

Moving Britain Ahead

December 2016

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1. Introduction

1.1 The Transport Technology Research Innovation Grant (T-TRIG) is a scheme that enables the Department for Transport (DfT) to fully fund early-stage research projects in support of innovative ideas or concepts that facilitate a better transport system.

1.2 This document provides details of the scope of the competition(s) within the T-TRIG scheme. Applicants are advised to consider these specifications along with the guidance document to ensure the application questions are addressed as best as possible.

1.3 The number and scope of the T-TRIG competitions varies with each round to remain in line with the Department's needs. Generally, it is formed of an open call and one or two targeted calls in specific areas.

1.4 The December 2016 T-TRIG scheme will comprise of three separate competitions. Each competition has been allocated its own budget. There will be:-

- An **open call** for a range of novel and innovative ideas focused on transport (budget £300k);

- A targeted **'maritime security'** call (budget £100k);

- A targeted **'big data'** call (budget £300k).

1.5 All competitions will use the same application form and assessment criteria.

1.6 All applications must be innovative and focussed on science, engineering or technology to solve a transport challenge.

1.7 Each individual application can only be submitted to one of the above competitions.

2. Open call competition

Scope – open call

2.1 The purpose of the open call competition is to seek innovative ideas that have the potential to address a UK transport challenge.

2.2 It should be noted that although the open call competition is available to all transport challenges, applicants should align their proposals with DfT's priorities.

2.3 Projects must clearly articulate what challenge is being addressed. The solution to this challenge must be innovative and focussed on science, engineering or technology or the use of the technology.

2.4 Projects should be at the early stage of research, looking to prove a concept or develop a feasibility study.

2.5 The research should describe what solution is being proposed and clearly highlight the innovative aspects.

2.6 The solution could well be a completely novel idea or approach. However, approaches or innovations from other areas, applied in a novel way to transport will also be of interest.

2.7 A fully competent team should be able to deliver the aims and objectives of the study and have identified relevant risks to the project. Risk mitigation measures should be suitably identified.

Budget

2.8 Applicants can apply for a project grant of up to £25,000.

2.9 The budget available for the open call is approximately £300,000. We are looking to fund up to 12 projects, however, this will depend on the quality of applications.

3. Maritime security

Overview

3.1 If applying to this targeted call competition, applicants are advised to consider this specification along with the guidance document to ensure the application questions are addressed as best as possible.

3.2 This specification will detail the scope of the Innovation for Maritime Security Applications (IMSA) competition and those aspects which are out of scope.

3.3 Maritime security refers to all issues relating to the protection of shipping and maritime infrastructure in ports and at sea, both in the UK and overseas.

3.4 The Department for Transport (DfT) works with UK ports and maritime operators to support the UK economy.

3.5 The IMSA competition is a standalone call for innovative solutions to enhance maritime security.

3.6 Project applications should describe how the proposed solution will enhance maritime security. It is acknowledged that early stage research may find it hard to be specific in this regard. However, the exploitation of any research should be considered.

Scope – maritime security

3.7 The Department is running a competition which will fund around 3-5 projects to either develop an initial prototype, a proof of concept or a feasibility study that demonstrates its potential to improve maritime security.

3.8 We are seeking projects that address existing threats to passengers, maritime shipping and infrastructure both in the port and at sea, in the UK and overseas.

3.9 We will consider any science or technology that could enhance any component of the wider security system. For example this could include: enhanced human factors; better use of data or enhanced systems integration. The anticipated benefits of the proposals could be operational (e.g. faster screening), presentational (e.g. passenger friendly security messages) or provision of better detection performance.

3.10 Example of ways in which maritime security could be supported include:

- Deterrence or identification of suspicious activity in the vicinity of vessels in ports, both over and above water and on land in busy environments;

- Alternative approaches to screening of passengers, vehicles and cargo boarding a vessel;

- Increasing the physical security of personnel and passengers on-board a vessel.

3.11 Projects that are out of scope include cyber-attacks or accidental collisions with external objects. Equally it will not cover the import or export of banned or controlled substances. Whilst HM Government is concerned with mitigating these threats, they are being considered and addressed in other government programmes.

3.12 Capability demonstrations of currently marketed or existing maritime security products are out of scope for this work. Projects must have an innovative aspect, although this does include products being used in innovative ways, outside of their original intended use.

3.13 This list is not exclusive. The Department is interested in any proposals that might offer significant improvements to systems, timings, processes or technology for maritime security. Ideas which offer only incremental updates to existing capability will not be considered.

3.14 Organisations are invited to submit applications on this basis.

Budget

3.15 The available budget for the targeted maritime security is around £100,000. We are looking to fund 3-5 projects, however, this will depend on quality of applications.

4. Enhancing the digital transport agenda (Big Data)

Overview

4.1 This specification is for applicants who wish to apply for the targeted competition to enhance the digital transport agenda through the use of Big Data, Artificial Intelligence (AI) and Machine Learning (ML) technologies.

4.2 This competition is being run with support from Innovate UK. Innovate UK works with people, companies and partner organisations to find and drive the science and technology innovations that will grow the UK economy - delivering productivity, new jobs and exports. Further information can be found at www.innovateuk.org

4.3 This competition will fund research into gaining tangible benefits from using Big Data, AI and ML to advance the UK's transport system.

Background

4.4 Big Data is already transforming the way we conduct science, deliver healthcare, improve performance, run cities and operate businesses. However, in the transport sector benefits exploitation is at a much lower level of maturity. Consequently, the Department is running this competition under the T-TRIG scheme to demonstrate what benefits can be achieved in the transport sector using Big Data.

4.5 The following is a working definition of "Big Data" used across Government:

Big Data refers to both large volumes of data with high level of complexity and the analytical methods applied to them which require more advanced techniques and technologies in order to derive meaningful information and insights in real time[1].

4.6 Within this definition, there is a fundamental assumption about the power and importance of new techniques and technologies, which are often called 'data analytics'. The real value of analytics is that it can draw out new meanings, insights and value from bringing together individual datasets, which on their own might have limited value.

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[1] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/389095/Horizon_Scanning_-_Emerging_Technologies_Big_Data_report_1.pdf

4.7 Big Data has the potential to transform the way transport operates by bringing different data sets together and using analytical tools to develop new insights, maximise efficiency gains, improve asset management and enhance the customer experience.

4.8 As enhanced computing and data analysis becomes more prominent – such as AI[2] and ML[3] - there is an opportunity to look at the next steps in the development of Big Data technologies and the transformative potential they can have in future transport systems and deliver tangible benefits to the travelling public.

4.9 The competition calls for applicants to put forward proposals that take the next step in using Big Data by utilising AI and ML to enhance value gained from data analysis in transport, including predictive capacity.

Scope – Big Data

4.10 This competition call is being run to stimulate ideas generation and test initial concepts around how accessible and existing datasets can lead to tangible transport benefits, for example reducing congestion, improving mobility or improving the customer experience. These projects will also help to inform the Department's future thinking in this area.

4.11 The Department is currently looking to many aspects of Big Data, data analytics and Internet of Things to better understand the impacts this will have on future mobility. The transformative effect of ML and AI and the impact it could have on the broader social and economic environment can be examined through this competition, helping the Department to gain a better understanding of the shape of future innovations and public understanding.

4.12 To inform this the Department will support projects designed to deliver transport benefits from the following areas:

- ML to enhance data analysis;

- Using AI in transport;

- Data linking and bring together disparate data sets to demonstrate benefit;

- Using enhanced computing to process existing transport or transport-related data.

4.13 The benefits identified should contribute to at least one of the following strategic objectives:

- Building on innovation excellence throughout the UK to deliver safer, secure and more sustainable transport;

- Boosting economic growth and opportunity;

- Turning scientific excellence into national commercial opportunities by developing a further understanding of the wider transport data, data analytics and integration, unlocking potential business models and data access to enable their exploitation;

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[2] AI allows a system to exhibit human-like intelligence in its responses through use of rational reasoning and deductive solutions.

[3] ML is a form of AI that allows a system to learn from results and amend itself accordingly.

- Building national technical and innovative UK capability through studying available data, exploitation and business models (costs/benefits, risks/mitigations, barriers/innovative solutions);

- Accelerating innovation in smart connected systems to improve journey interchange and experience.

4.14 Projects supported through this T-TRIG application must deliver a robust evaluation of the transport benefits that their Big Data proposals can bring. Successful bids will need to demonstrate:

- What transport challenges the innovation is aiming to solve;

- Evidence of state-of-the-art innovation being carried out in practice;

- That the team has the skills and expertise to deliver the project plan;

- The project will deliver tangible transport and/or commercial opportunities for the UK;

- Value-for-money.

4.15 The Department wants genuinely innovative solutions and would welcome bids from 'non-transport' organisations or consortia that can see a role for their technologies, tools and approaches in delivering transport benefits.

4.16 These feasibility studies and proof of concepts, if proven, may bid for additional funding in future calls to support further development and testing. The Department may also suggest areas of joint working with partner organisations to help move further towards commercialisation.

4.17 Organisations are invited to submit separate applications (up to two applications, one per challenge) on this basis.

Budget

4.18 The indicative budget for the competition is £300,000 in total to fund 6-8 projects.