



Department
for Transport

DfT Transport Technology Research Innovation Grant (T-TRIG)
July 2016

Grant Application Form

Please complete your proposal for the DfT Transport Technology Research Innovation Grant (T-TRIG) on this form. You should email a pdf version of the completed form to:

T-TRIG@dft.gsi.gov.uk by midnight 22nd August 2016

The Department for Transport (DfT) is looking to explore and exploit technology, capabilities and knowledge that will move transport forward in the UK. One way that we are approaching this is through delivery of short, sharp and potentially ambitious projects that are capable of delivering tangible benefits.

Project Title

Better signals using co-operative vehicle data

Company/Organisation name

City of York Council

Competition applying for *(please tick one box ONLY)*

Open-Call Competition ☐

Targeted-Call Future Aviation Security Solutions ☐

Targeted-Call Intelligent Transport Systems ☒

[A] AWARENESS OF T-TRIG COMPETITION*How did you learn about this T-TRIG competition? (Tick all that apply)*

[A.1]	Previous experience of applying for T-TRIG <input checked="" type="checkbox"/> DfT website <input checked="" type="checkbox"/> Media (i.e. online news, newspapers) (please specify) Twitter <input type="checkbox"/> LinkedIn <input type="checkbox"/> Other social media channels (please specify) Informed by KTN (Knowledge Transfer Network) (via emails, word of mouth etc.) <input type="checkbox"/> KTN website <input type="checkbox"/> Informed by TSC (Transport Systems Catapult) <input type="checkbox"/> Other (please specify)
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[B] COMPANY/ORGANISATION INFORMATION

[B.1]	Full company/organisation name. <i>(If this application is successful, this is the name that will be used in publicity, unless an alternative name is clearly specified here)</i>	City Of York Council
[B.2]	Registered office address	West Offices, York, YO1 6GA
[B.3]	Company/organisation or charity registration number	not applicable
[B.4]	Is your company a micro, small or medium sized enterprise (SME)? <i>(Select from list)</i>	Select Other: Local Highway Authority
[B.5]	Is your company/organisation a voluntary, community or social enterprise organisation? <i>(Select from list)</i>	Select Other: Local Highway Authority
[B.6]	Name of your immediate parent company (if applicable)	not applicable
[B.7]	Details of other organisations (company name, contact person, address and their role in the project) that will help deliver the project	White Willow Consulting (project managers - Andy Graham; INRIX - data providers - Graham Bradley;
[B.8]	Details of authority involved (e.g. local authority, highways authority etc.), if applicable (authority name, contact person, address and their involvement in the project)	Local Highway Authority as above

[C] COMPANY CONTACT

[C.1]	Contact's name	Darren CAPES
[C.2]	Contact's position	Transport Systems Manager
[C.3]	Contact's address, postcode and country	City of York Council, West Offices, York YO1 6GA
[C.4]	Contact's telephone number	01904 551 651
[C.5]	Contact's mobile number	07973 419 363
[C.6]	Contact's e-mail address	darren.capes@york.gov.uk
[C.7]	Name of contact in Finance (for providing financial documents)	Jayne Close
[C.8]	Phone and email address for Finance contact	01904 554 175 Jayne.Close@York.gov.uk

[D] CONFLICT OF INTEREST

Pass/Fail

Please Note: Question D.1 is a Yes/No question and will dictate whether or not the following question needs to be answered.

Question D.2 is a Pass/Fail question. If an applicant cannot or is unwilling to suitably demonstrate that they have suitable safeguards to mitigate any conflict of interest then their application will be deemed non-compliant and they will NOT be considered for this competition.

[D.1] Please confirm whether you have any potential, actual or perceived conflicts of interest that may be relevant to this competition. *(Tick as appropriate)*

Yes

☐

No

☒

[D.2] If answered Yes in D.1, please provide details of any potential, actual or perceived conflicts of interest in respect of this project and outline what safeguards would be put in place to mitigate this risk arising during the project.

[E] INNOVATIVE NATURE OF PROPOSAL

[E.1]

It is important that the project is novel or innovative. Has similar research been commissioned or carried out previously? *(Tick as appropriate)*

Yes

☐

No

☐

If yes, please explain why your proposal is still a novel approach

Some research has been undertaken into the benefits of using data from vehicles to improve how traffic signals are controlled, notably by INRIX and Purdue University (US), Dynniq (Netherlands) and Southampton University/ TRL (UK). This benefit largely is through having more data on the actual location of vehicles and the hence size and shape of traffic queues than current sensors (such as loops) can provide. Having this allows traffic management strategies to be used more effectively to reduce delays, improve emissions and improve safety. It could give authorities new tools to deploy policies by controlling traffic more effectively, whilst potentially saving costs. It is also a stepping stone to autonomous vehicles.

No research has yet looked at the practical possibility of using this data in a UK context, on real world benefits and impacts on various UK traffic systems such as SCOOT and MOVA. The work to date has largely been simulations of potential benefits - which are encouraging- rather than assessing practical feasibility and costs and benefits. A previous TTRIG report on vehicle priority highlighted a similar research gap. So our key novelty is to bring together a network operator - City of York Council, with real world problems with industry suppliers of vehicle data and the equipment used to control signals. This team will research how real junctions in York could be improved using data from vehicles, to match local policy aims and the implications on the roads authority, signal and data suppliers. This would be a "paper prototype" for a later demonstration using real vehicle data and junctions.

The second key novelty is that previous work has considered large cities, with high volumes of traffic and where authorities have large traffic control resources (people and funding). In contrast, we will consider a small city with limited resources and the pressure to do "more for less", of which there are many in the UK like York, and how the technology can be applied there, bringing research learning applicable to many parts of the UK to bring co-operative solutions nationwide.

The third innovation is to consider data from beacons that connect to the traffic signals directly and data via a service provider (INRIX). We will consider the benefits and practicality of both approaches, especially at low penetration rates of beacon technologies, and on possible hybrids of road sensors and other data.

It is also innovative as it is being run by a local authority, not a supplier. City of York Council is committed to using new technology to deliver transport policy objectives. We recognise the need to prepare both traffic management and vehicles, but this needs to be balanced against ongoing pressure on resources and the need to make better use of assets, deliver innovation cost effectively and limit ongoing revenue costs. These aspirations and pressures are common to many local authorities and so developing real world strategies for traffic control in an environment of advanced vehicle sensing and connected vehicles would have UK wide benefits.

[F] PROJECT PROPOSAL

PROJECT TITLE

Better signals using co-operative vehicle data

PROJECT OUTLINE

Research into cost effective urban traffic signal optimisation in a world of advanced sensing multiple data sources and connected vehicles

PUBLIC PROJECT SUMMARY

Please expand on your single line outline (max 250 words). Please note: If you are successful, this summary will be used to publicise the project, therefore, please ensure this is a publicly suitable version of your project summary.

Research suggests that position data from vehicles can improve how traffic signals are controlled, as this data can give a richer picture of the size and location of traffic than current sensors such as loops do. Such data is already available from UK vehicles through INRIX's GPS feed, and could also be gathered from future beacons.

But although this research is promising, it has been largely simulation and does not address UK traffic systems. It is also not clear what practical steps a UK road authority must undertake to exploit this opportunity, and what costs and benefits might be (reduced delays, maintenance costs, improved emissions, data supply...).

Hence this project will focus on a main road corridor into York and examine opportunities new technologies offer for cost effective enhanced traffic management. City of York Council faces the same challenges found across the UK in managing congestion, promoting public transport, air quality and environmental issues and meeting ongoing financial pressures.

We aspire to exploit new technologies in new and improved services and meet changing expectations of transport users. In looking at real junctions, we will assess practical work needed to use new data, how existing equipment and sensors might be retained, how well SCOOT and other techniques are suited to this, what new policies might be supported and what the overall benefits might be.

The result will be a blueprint for a future "co-operative" junction of value to any UK authority and to help enable the path to automated vehicles.

Continuation sheet

Please confirm the question number you are answering at the start of the continuation.

not used

T-TRIG July 2016 Grant Application Form

The following five sections form the main body of the proposal and the assessment criteria are set against these (see T-TRIG Grant Specification and Assessment Criteria). When answering these sections you may find it useful to refer to the DfT's [Priorities](#). Please refer to Annex D for detailed explanations of how applications will be assessed.

Sections	Weighting factor	Maximum score
1. What is the challenge or issue being addressed by the proposed project?	1	10
2. What is the solution being proposed? What innovations are being presented and why would they improve the issue being addressed in the proposal?	4	40
3. How is this project going to be delivered and by whom? Please provide details of deliverables, project plans and methodology. The applicant must demonstrate an ability to structure the work needed to test the feasibility of their innovations.	1	10
4. How will the applicant exploit the output of the proposed project to deliver impact on DfT's priorities and UK transport? The applicant must clearly demonstrate how this grant would add value to the current situation.	3	30
5. Project finances. Does the project demonstrate value for money?	1	10
TOTAL	10	100

Over and above these criteria, applicants must demonstrate an ability to communicate their ideas effectively by writing clearly and succinctly throughout. An inability to do so will reduce the score you achieve for each section affected. Likewise, final payment of the grant is dependent on receipt of a good quality Final Report that clearly sets out the objectives of the project, how the grant was spent and what was achieved with it.

Once complete, please send your application in pdf format to: T-TRIG@dft.gsi.gov.uk . Questions should also be directed to this email address.

[1]	What is the challenge or issue being addressed by the proposed project?
<p>What are the aims and objectives of the project? What transport challenge is it trying to address? Provide evidence of the impact of the issue you are addressing and of the value society would derive from successfully addressing this challenge. Comment on the timescales and chances of delivering these benefits.</p> <p><i>Notes: do not discuss your solution. Concentrate on the challenge and the societal values associated with solving it. Be specific around the proposed beneficiaries, e.g. who would save costs or have reduced journey times? Where this project proposal only covers one element of a larger development programme then discuss the problems addressed by the wider programme rather than restricting yourself to this element.</i></p> <p>Maximum score available:10</p>	
<p><i>Please provide details for the problem or issue being addressed by the proposal (max 300 words)</i></p> <p>The aim is to overcome the challenge UK Local Authorities face in deploying co-operative technology to improve traffic signals.</p> <p>UK authorities face the challenge of reducing resources but increasing policy demands. The need to address congestion, vehicle emissions and safety whilst supporting economic growth and prosperity presents a complex challenge. The benefits of even a small improvement are valuable, with congestion costing the UK around £10bn per annum and emissions now becoming the dominant cause of transport related deaths.</p> <p>Traffic signals are a key tool to address this challenge and benefit all types of road users; MOVA for example can reduce delay by £220m per year (DfT). As systems age and authorities look to replace and expand them, emerging in-vehicle and Internet technologies have a crucial part to play in meeting this challenge in the next 5 years, but current DfT research shows few to be actively considering them. There is a danger that co-operation develops only in larger cities that can afford it, out of alignment with the "one nation Britain" objective.</p> <p>The UK needs to understand how to exploit co-operative vehicles for the good of all road users, to avoid a patchwork of disconnected deployments that will confuse the market and motorist.</p> <p>Opportunities presented by 'the Internet of things' raise the expectation among transport users that transport networks will provide increased levels of information and adapt more readily to users' needs and conditions. As local authorities consider investment in replacing aging traffic control systems with new ones, it is essential that good guidance exists to inform decisions regarding what should be specified to maximise exploitation of new technology and understand ways in it can meet policy objectives.</p>	

Continuation sheet

Question 1

Please confirm the question number you are answering at the start of the continuation.

Not used

[2]

What is the solution being proposed? What innovations are being presented and why would they improve the issue being addressed in the proposal?

In what ways is the project innovative? Describe the concepts or technology proposed (*please attach and label a Gant chart as a separate annex in your email/ if attaching graphs please attach and label as a separate annex in your email etc*). Demonstrate the use of novel, innovative approaches, new concept, methodologies, tools or technologies. Give a justification as to why these innovations are capable of delivering the solution to the problem as outlined in section 1.

Notes: Concentrate on the technical aspects of your innovations. Where this project proposal only covers one element of a larger development programme then discuss the innovations of the wider programme rather than restricting yourself to this element.

Maximum Score available: 40

Please provide details (max 700 words)

Our solution is to understand and overcome barriers to deployment of "co-operative" signal junctions, by looking at how latest innovations could be deployed. The key is use of data from "connected" vehicles - which could be as simple as a traffic information app in an older vehicle through to vehicle to infrastructure (v2i) technologies in future vehicles. The core is that individual vehicles can tell traffic signals where they are, to allow better co-operation between vehicles and infrastructure. This can include measuring the end of queues directly as vehicles come to a stop.

Some work exists on benefits of co-operatively using data from vehicles to improve how traffic signals are controlled to address the transport challenges. This has notably been by INRIX and Purdue University (US), Dynniq (Netherlands) and Southampton University (UK). This benefit occurs through having more data on the actual location of individual vehicles and the hence size and shape of traffic queues than current point based sensors (such as loops) can provide. This allows traffic management strategies to be used more effectively. But no research has yet looked at the practical possibility of using this data in a UK context, on real world benefits and impacts on various UK traffic systems such as SCOOT and MOVA. The work to date has largely been simulations of potential benefits - which are indeed encouraging- rather than assessing practical feasibility and measuring costs and benefits. A previous TTRIG report on vehicle priority highlighted the gap between theory and practice in a similar area.

Our innovation is to bring together a network operator - City of York Council, with real world traffic and transport policy problems with industry suppliers of vehicle data and the equipment used to control signals. This team would research how real examples of junctions in York could be improved using data from vehicles, to match local policy aims and the implications on the roads authority, signal and data suppliers. This would be a "paper prototype" for a later co-operative demonstration using real vehicle data and real junctions.

As shown in the Gantt Chart, the project would firstly capture the state of the art on signals and vehicle data through discussions with INRIX and Dynniq's global experts allied to a short review of latest literature. The solution would then:

a) Identify different traffic signal control approaches that could help a UK local highway authority deliver policy benefits using co-operative vehicles and map which types of data would be needed, as well as benefits over existing sensors.

Continuation sheet

Question 2

Please confirm the question number you are answering at the start of the continuation.

Q 2 continued

This will bring in INRIX and Dynniq connected vehicle experience. This will also include the work on the A2/M2 pilot, the Nordic Way, the Amsterdam Group, as well as standards groups like OCIT. Even after Brexit we will exist in a pan-European environment what it comes to signal technology development and procurement and Automotive data.

b) Identify the impacts on current controller design / specifications to understand what needs to be done to make standard UK traffic equipment . This includes beacon and probe data approaches

c) examine junctions on the A59 corridor in York where new technology might give benefits and identify other policy implications. These sites are representative of many junctions in small UK cities/ large towns.

d) Work with IDT, INRIX and DYNNIQ to assess how such junctions would be equipped and likely benefits against policy, including such areas as ability to support freight (for economic growth) and public transport, and also new areas such as SPAT (Signal Phase and Timing)

e) Produce designs for on-site deployment ready for testing (a subsequent stage of research)

f) Develop a report with key lessons for DfT, UK authorities, industry and CCAV and then disseminate this.

This approach marries established data from sensors, off the shelf data from probe vehicles and new data from beacon based systems to solve existing real world problems.

This will deliver the solution to the challenge in question 1 as it is led by practitioners with the support of industry, with a "one Britain" deployment as a key need. The key drivers for the research will be practicality and cost reduction to deliver policy benefits - overcoming the barriers DfT research showed are stopping Local Authorities investing now.

[3]

How is this project going to be delivered and by whom? Please provide details of deliverables, project plans and methodology. The applicant must demonstrate an ability to structure the work needed to test the feasibility of their innovations.

What deliverables do you expect to provide, to what timescale and by whom? Please include a Gantt chart. What are the risks to delivery and what measures will be taken to mitigate these? **You must clearly demonstrate an ability to structure the work needed to test the feasibility of your innovations.**

*Notes: Concentrate on this specific project, and not any wider programme. **Maximum Score available: 10***

Please provide details (max 500 words plus Gantt chart).

COYC will be the prime contractor for the work responsible for delivery, and undertake much of the local research and junction design, providing a dedicated project manager Andy Graham of White Willow as a subcontractor.

INRIX will provide access to their data and US research experts at no cost for probe data, while Dynniq will do likewise for traffic signal control aspects. IDT Ltd will also provide expertise in roadside beacon technology. These are all providing expert review resources to marry a Local Authority with industry research.

The project plan is shown in the Gantt chart and includes several work stages that map to the areas a) to f) above, moving the concept from low TRL to a pilotable design.

Workstages are:

- Project inception and a state of the art review, resulting on a milestone working note to capture key research to date. This will be done by Andy Graham based on his PhD research and work for CCAV on junction capacity
- Examining the implications of this research on junctions in York (COYC with assistance from INRIX, IDT and Dynniq) to assess practical feasibility
- Developing concepts for key junctions on the A59 (schematic drawings, lists of changes needed, back office connections...) (COYC)
- Capturing the implications of this concept by all partners to assess its feasibility and identify what the next steps would be in any demonstration
- Writing and submitting a report (Andy Graham and COYC)
- Ongoing dissemination of results (all partners)

Hence our deliverables are:

- A short note on solution state of the art (picking up latest information from projects such as Compass4D)
- Test junction conceptual schematic designs
- Papers and articles for the Local Authority community
- Test plan for next stages of demonstrations
- Report

Our methodology tests feasibility of the solution by having Local Authority staff design the junctions which are then reviewed by experts from industry in an iterative approach, to ensure their research can be deployed practically and lessons are learned on feasibility in the UK.

Continuation sheet

Question 3

Please confirm the question number you are answering at the start of the continuation.

Q3 continued

Risks to delivery are:

- i. The ideas and designs developed not applicable widely in all UK traffic systems. This will be mitigated as Dynniq will help ensure several approaches are considered and evidence in our deliverables will show that York is a 'normal' UK city with traffic flow profiles for the A59 normal for an urban corridor
- ii. Sensor data quality / availability. This is mitigated as INRIX has 1 million probes in the UK but will test in York specific junctions and data availability
- iii. One technology is favoured - this is mitigated by IDT and INRIX bringing complementary ways to monitor junctions using different technologies
- iv. Reinventing other research. Dynniq and INRIX are both at the forefront of research globally and will cross check we continue to be novel
- v. Too much research work for a busy local authority with day to day pressures. This is mitigated by an expert project manager with experience in connected vehicles, Andy Graham.

[4.1]

How will the applicant exploit the output of the proposed project to deliver impact on DfT's priorities and UK transport? The applicant must clearly demonstrate how this grant would add value to the current situation.

Describe how the outcome from this research is likely to have an impact on transport. If this project is part of a wider programme, discuss both how the outputs from this project support the wider programme and how the wider programme will deliver impact.

Describe how the DfT funding will enable this work to advance.

Notes: Discuss both your proposal and the work that surrounds it, especially if it is part of a wider programme. What effect will this project have on your ability to complete the wider programme? For example, is the access to DfT significant or would completing a pilot funded by this grant enable access to wider funding. Specifically comment on the effect of not receiving this grant on your ability to move forward with your innovations.

Maximum Score available: 30 (total score for sections 4.1, 4.2 and 4.3)

Please provide details (max 500 words)

The outcome from this research will impact on DfT priorities and UK transport as follows:

- economic growth by reducing congestion and improving journey times
- a one nation approach to co-operative vehicles
- better journeys
- ability to deploy new technology with limited resources

Specifically, the grant money will allow COYC to explore new technology solutions to congestion and emission reduction on behalf of other smaller UK authorities, and help remove barriers to introduction of co-operative systems. The outputs will help other LAs and UK industry but also help COYC in deploying its own policies .

Without this grant, COYC would not undertake this work and would rely on other evidence to justify investment in the solutions researched. However, this could take some time . Hence the grant adds value by accelerating UK deployments, providing practical help to UK LAs and by supporting UK industry in providing tools for deployment.

Completing this early stage of research would help COYC become a test bed for future pilots and demonstrations of small city approaches.

Continuation sheet

Question 4

Please confirm the question number you are answering at the start of the continuation.

not used

[4.2]	Which of the following DfT's priorities is the application aiming to address? (Tick as appropriate).
a)	Boosting economic growth and opportunity <input checked="" type="checkbox"/>
b)	Building a One Nation Britain <input checked="" type="checkbox"/>
c)	Improving journeys <input checked="" type="checkbox"/>
d)	Safe, secure and sustainable transport <input checked="" type="checkbox"/>
e)	other (please specify) +

[4.3]	List the deliverables
<p>Consider producing as many deliverables as possible to help your project make a strong impact after it is completed. As a minimum deliverable, you must produce a report. In addition what other dissemination activities are you planning for this project?</p> <p>a) Report (please note if report is confidential, a public version is also required) <input checked="" type="checkbox"/></p> <p>b) Prototype Product/Trials/Testing <input type="checkbox"/></p> <p>c) *Software <input type="checkbox"/></p> <p>d) *Demonstrations <input type="checkbox"/></p> <p>e) *Presentations <input checked="" type="checkbox"/></p> <p>f) *Publish Papers/Journals <input checked="" type="checkbox"/></p> <p>g) *Other dissemination activities with stakeholders for policy, products and services developed <input checked="" type="checkbox"/></p>	
<p>*(please provide detail of activities such as approx. dates, audience/conference and purpose)</p> <p>Our overall deliverable will be a report with the conceptual designs that we will disseminate to the Local Authority user community. But we feel the real values comes from the learning transfer to other authorities by presentation and dialogue. We plan to promote our work at the following:</p> <ul style="list-style-type: none"> • The ITS UK / DfT Local Authority Autumn Conference (Oct / Nov) • Traffex Exhibition at the NEC Birmingham - Spring 2017 • Transport Technology Forum meetings <p>COYC and WWC are working on the IET emerging technology guide and this would be a useful channel to help Local Authorities understand co-operative vehicles and gain confidence.</p> <p>We will work with our contacts in media to ensure that the report is widely known about, and will also post links on LinkedIn groups, the forth coming TTF website and via ITS -UK.</p> <p>INRIX, IDT and Dynniq all have substantial local authority customer bases who would be communicated with appropriately about the results.</p> <p>We will also work closely with CCAV to ensure the findings and implications are shared.</p>	

[5]**Project Finances. Does the project demonstrate value for money?**

[5.1] Please provide costings with justification for the grant amount requested. Specify the number of staff utilised, their expertise level, their daily charge rate and number of days of work as well as other costs such as equipment etc. clearly in table [6.2]. Make sure each expense listed below is justified. Please clearly specify costs such as material, sub-contracting (including VAT).

Clearly specify the total amount of funding sought in [5.4].

Maximum Score available: 10 (total score for sections 5.1, 5.2, 5.3 and 5.4)

Please provide details (max 300 words)

Our total funding requested is £16,625 for staff costs and expenses. This funds COYC resources plus a subcontracted project manager plus survey expenses and T+S for meetings. INRIX, IDT and Dynniq are providing services at no cost to DfT.

Staff Requirements

City of York Council

Transport Systems Manager - £1500; (5 days at £300 / day)

Systems Engineer x 2 - £3825; (17 days at £225 / day)

Systems Technician - £1800; (10 days at £180 / day)

Sub-contractor (see not below)

Project Manager - £6000; (12 days at £500 / day)

Ancillaries

Junction surveys to establish baseline infrastructure- £1500

Travel and Subsistence / meeting costs- £2000

A dedicated project manager with research expertise is needed as a subcontractor as COYC staff have extensive traffic control experience but are not R+D experts, and also have little spare resource for writing reports. By focussing their expertise on practical research and deployment issues better value is obtained. The £500 rate is low compared to market charges.

This level of funding will provide resource for CYC staff to undertake in detail the conceptual design work required and make full use of the input from non funded industry contributors, (primarily INRIX, Dynniq and IDT Ltd). It will allow for the development of conceptual solutions and completion of desk-top design and feasibility study work. This will result in the production of a report and out-reach activities jointly by COYC staff and the external project manager. Such work could not be funded by COYC.

Hence the project offers value as it brings significant added resource at no cost, has a focus on practical outcomes that could bring extensive UK benefits in line with DfT policy and uses practical expertise from a UK highway authority.

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[5.2] Payment of 30% of grant payment at beginning of project
Applicant should indicate in the box below if they wish to receive 30% of the grant when they sign the Grant Offer Letter. *(please select as appropriate)*

I wish to receive 30% advance payment and 70% at the end once my report is approved by the DfT

[5.3]	Cost Items <i>(insert/delete rows as required)</i> (Successful applicants will need to use these figures in the budget column of the Statement of Grant usage form)	Budget £
Name of Employee 1	D Capes 5 days@£300 daily rate £	1500
Name of Employee 2	A Thellmann 12 days @£225 daily rate £	2700
Name of Employee 3	M Banham 5days@£225 daily rate £	1125
Name of Employee 4	S Bulmer 10 days@180 daily rate £	1800
Consultancy/Sub-contracting charges		6000
Material costs		1500
Other Expenses (please specify)		2000
TOTAL COSTS		16625

[5.4] Total funding sought from T-TRIG *(This should match the Total Costs in [5.3], If not please explain below)* £ 16625

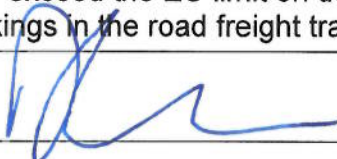
[G] GRANT CLAIM		Pass/Fail
[G.1]	Is this research project you have described in this application receiving any funding from other public authorities or private companies? <i>(Tick as appropriate)</i>	
Yes <input type="checkbox"/>		No <input type="checkbox"/>
<p><i>If yes, please list the organisations and give details below:</i></p> <p><i>Public Authorities:</i></p> <p><i>Private Companies:</i></p> 		

State aid can occur whenever state resources are used to provide assistance that gives organisations an advantage over others. The rules governing state aid are complicated but it is important that you consider these fully when applying for T-TRIG. Please see **Annex A** for further information.

[G2]	<p>Please tick ONE of the three grant options listed below: It is IMPORTANT that you read the Guidance and ANNEXES A-C and understand the three options below before selecting the grant aid option.</p>
1. <i>De minimis</i> (Go to Section G.3)	<input checked="checked" type="checkbox"/>
2. GBER– Fundamental Research (Go to Section G.4)	<input type="checkbox"/>
3. Non-Economic Research (Go to Section G.5)	<input type="checkbox"/>
<p>Please note that the DfT will check your aid option and ensure that there is sufficient justification. However, if the reasons or information provided do not meet relevant criteria, you may be offered the grant under a different aid option, if eligible.</p>	

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Please **ONLY** complete section G.3 if you have opted to apply for grant aid under *de minimis* in section G.2 (**DO NOT** complete Sections G.4 and G.5).

[G.3]	Apply for Grant under the <i>De minimis</i> option (See Annex B)																						
<p>The <i>de minimis</i> Regulation allows small amounts of aid – less than €200,000 [€100,000 for undertakings in the road freight transport sector] over 3 rolling fiscal years – to be given to an undertaking for a wide range of purposes. Please read Annex B, which sets out what is needed to ensure compliance with those limits. You should note carefully the requirements and the obligations. If you have any queries please refer to FAQs first and email queries outside of the FAQs to T-TRIG@dft.gsi.gov.uk.</p> <p>Please sign this form confirming your eligibility for support in section G.3.3</p> <p>Statement of <i>de minimis</i> aid received.</p> <p>I confirm that I have received the following <i>de minimis</i> aid during the previous 3 fiscal years (i.e. current fiscal year and the previous two fiscal years):</p> <table border="1"> <tr> <th colspan="3">[G.3.1] Table of <i>de minimis</i> Aid Received in the last 3 fiscal years</th> </tr> <tr> <th>Body providing the assistance/aid</th> <th>Value of assistance (calculating the Gross Grant Equivalent)</th> <th>Date of assistance</th> </tr> <tr> <td>NA</td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> </tr> </table>			[G.3.1] Table of <i>de minimis</i> Aid Received in the last 3 fiscal years			Body providing the assistance/aid	Value of assistance (calculating the Gross Grant Equivalent)	Date of assistance	NA														
[G.3.1] Table of <i>de minimis</i> Aid Received in the last 3 fiscal years																							
Body providing the assistance/aid	Value of assistance (calculating the Gross Grant Equivalent)	Date of assistance																					
NA																							
[G.3.2]	<p>I acknowledge that if I fail to meet the requirements for <i>de minimis</i> aid set out in Annex B, I/we shall become liable to repay the full grant back to the DfT.</p> <p>Yes <input checked="" type="checkbox"/> No <input type="checkbox"/></p>																						
[G.3.3]	<p>Signature to confirm that by receiving this grant under <i>de minimis</i> you will NOT exceed the EU limit on <i>de minimis</i> of €200,000 (€100,000 for undertakings in the road freight transport sector) in 3 fiscal years?</p>																						
<p>Please sign here: </p>																							
<p>Name: Darren Capes</p>																							
<p>Position: Transport Systems Manager</p>																							

Please **ONLY** complete section G.4 if you have opted to apply for grant aid under GBER-Fundamental Research in section G.2 (**DO NOT** complete sections G.3 and G.5).

[G.4]	Apply for Grant under GBER Article 25: Aid for Research, development & innovation: Fundamental Research
Fundamental Research is defined as " <i>Experimental or Theoretical work undertaken primarily to acquire new knowledge of the underlying foundations of phenomena and observable factions, without any direct practical application or use in view</i> ".	
[G.4.1]	What new Fundamental Research knowledge is being sought by this project?
[G.4.2]	Has this type of experimental research been done before? If Yes, please explain how your proposal is different
[G.4.3]	Describe the 'experimental or theoretical' work planned
[G.4.4]	Are there any direct or practical applications for commercial use? Please explain your answer.
[G.4.5]	How would this theoretical/experimental research be taken forward if this project did not receive grant funding from the DfT?
[G.4.6]	Signature to confirm that by receiving this grant under <i>GBER Article 25: Aid for Research, development & innovation: Fundamental Research</i> you will be using the funds for the purpose of 'Fundamental Research' as described overleaf in the guidance documents in section G.2.
Please sign here:	
Name:	
Position:	

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Please **ONLY** complete section G.5 if you have opted to apply for grant aid under Non-Economic Research in section G.2 (**DO NOT** complete sections G.3 and G.4).

[G.5]	Apply for Grant under Non-Economic Research
<p>Is the activity proposed in the application a "non-economic" activity? The UK Government takes non-economic activities to mean that there is not a competitive market for the delivery of the service. Please read Annex C, which sets out details of non-economic activities and what this means in practice for T-TRIG grant recipients.</p> <p>If you have any queries please refer to the Guidance first and email any other queries to T-TRIG@dfi.gsi.gov.uk.</p>	
[G.5.1]	On what basis (see Annex C) are you applying for Non-Economic Research? Please provide an explanation of the Research activity.
[G.5.2]	Are you planning to use this grant funding for any Economic activity? Please give explanation to your answer.
[G.5.3]	Outline your plans for dissemination of research results.
[G.5.4]	Please provide details of timescale for dissemination and justification for the timescale.
[G.5.5]	Signature to confirm that by receiving this grant under <i>Non-Economic Research</i> you will be using the funds for the purpose of 'Non-Economic Research' as described in Annex C .
Please sign here:	
Name:	
Position:	

[H] FUTURE OPPORTUNITIES**[H.1]**

Could the DfT contact you about other innovation research competitions? *(Tick as appropriate)*

Yes

☒

No

☐
[H.2]

Should this application be successful for the grant, the DfT would like to share your project details with partners to see if there are further funding opportunities. Please tick if you are content for DfT to share details of your project with others who may be interested in working with you to progress the results of this project.

Note: Details will only be shared if you are successful and give permission by ticking the boxes below.

- ☒ Knowledge Transfer Network (KTN)
- ☒ Transport Systems Catapult (TSC)
- ☒ Others

ANNEX A: State Aid considerations and guidance

T-TRIG provides 100% grant funding under one of the three grant options; two of which are classified as state aid (*de minimis* and GBER), the third (non-economic research) is not classified as state aid.

- [De minimis](#)
- [GBER Article 25 Aid for Research, Development & Innovation – Fundamental Research](#)
- [Non-Economic Research](#)

Further information on State Aid is available from the following links to Department of Business, Innovation and Skills documents and a guide for Universities

- [State Aid: The Basics Guide \(July 2015\)](#)
- [The State Aid Manual \(July 2015\)](#)
- [State Aid: Frequently Asked Questions](#)
- [State Aid in Research, Development and Innovation: A Guide for Universities](#)

ANNEX B: *De minimis* option (relates to section G.3)

The Grant may be offered under the *de minimis* aid and as such Commission Regulation (EC) No 1998/2006 applies.

In order to minimise distortion of competition the European Commission sets limits on how much assistance can be given without its prior approval to organisations operating in a competitive market.

Under EC Regulation 1407/2013 (*de minimis* Aid Regulation) as published in the Official Journal of the European Union 24 December 2013⁴², the support provided is a *de minimis* aid. There is a ceiling of €200,000 [€100,000 for undertakings in the road freight transport sector] for all *de minimis* aid provided to any one organisation over a three fiscal year period (i.e. your current fiscal year and previous two fiscal years). Any *de minimis* aid provided to you under this scheme will be relevant if you wish to apply, or have applied, for any other *de minimis* aid. You will need to declare this amount to any other aid awarding body who requests information from you on how much *de minimis* aid you have received.

Please advise us of any other *de minimis* aid which your enterprise and any enterprises linked to it may have received during your current and previous two fiscal years, as we need to check that our support added to that previously received, will not exceed the threshold of €200,000 (€100,000 for undertakings in the road freight transport sector) over the last 3 fiscal years. *de minimis* Aid includes not only grant but also assistance such as free or subsidised consultancy services, marketing advice etc. If you are in any doubt about whether previous assistance received classes as *de minimis* assistance please include it.

ANNEX C: Non-economic research (relates to section G.5)

Where an organisation carries out activities of both economic and non-economic nature, the public funding of the non-economic activities will not fall under Article 107(1) of the Treaty if the two kinds of activities and their costs, funding and revenues can be clearly separated so that cross-subsidisation of the economic activity is effectively avoided. Evidence of due allocation of costs, funding and revenues can consist of annual financial statements of the relevant entity.

The Commission considers that the following activities are generally of a non-economic character:

(a) primary activities of research organisations and research infrastructures, in particular:

- Education for more and better skilled human resources. In line with case-law and decisional practice of the Commission, and as explained in the Notice on the notion of state aid and the SGEI Communication¹, public education organised within the national educational system, predominantly or entirely funded by the State and supervised by the State is considered as a noneconomic activity;
- Independent R&D for more knowledge and better understanding, including collaborative R&D where the research organisation or research infrastructure engages in effective collaboration;
- Wide dissemination of research results on a non-exclusive and non-discriminatory basis, for example through teaching, open-access databases, open publications or open software.

(b) Knowledge transfer activities, where they are conducted either by the research organisation or research infrastructure (including their departments or subsidiaries) or jointly with, or on behalf of other such entities, and where all profits from those activities are reinvested in the primary activities of the research organisation or research infrastructure. The non-economic nature of those activities is not prejudiced by contracting the provision of corresponding services to third parties by way of open tenders.

Where a research organisation or research infrastructure is used for both economic and non-economic activities, public funding falls under state aid rules only insofar as it covers costs linked to the economic activities. Where the research organisation or research infrastructure is used almost exclusively for a non-economic activity, its funding may fall outside state aid rules in its entirety, provided that the economic use remains purely ancillary, that is to say corresponds to an activity which is directly related to and necessary for the operation of the research organisation or research infrastructure or intrinsically linked to its main non-economic use, and which is limited in scope. For the purposes of this grant competition, the Commission will consider this to be the case where the economic activities consume exactly the same inputs (such as material, equipment, labour and fixed capital) as the non-

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economic activities and the capacity allocated each year to such economic activities does not exceed of the relevant entity's overall annual capacity.

In practice this means that the T-TRIG grant recipients cannot claim for inputs (such as material, equipment, labour and fixed assets) for economic research.

ANNEX D: Assessment Criteria used by the DfT for assessing T-TRIG applications (relates to completing the proposal in section F)

Assessment Criteria		Maximum score criteria
1. What is the challenge or issue being addressed by the proposed project?	10	The proposal has described an evidenced problem with extensive links to the priorities of the DfT. Effort has been made to identify specific beneficiaries. The number of beneficiaries has the scope to represent a significant impact on the UK.
Score/Comments (DfT Use Only)		
2. What is the solution being proposed? What innovations are being presented and why would they improve the issue being addressed in the proposal?	40	The technical approach described is highly credible and innovative. It shows a strong likelihood of meeting the challenge. The technical solution has practical applications.
Score/Comments (DfT Use Only)		
3. How is this project going to be delivered? Please provide details of deliverables, project plans and methodology. The applicant must demonstrate an ability to structure the work needed to test the feasibility of their innovations.	10	The proposal contains a plan for the project noting the expertise/skills of the team and how the project will be managed. It details clear deliverables. The method adopted for the project demonstrates world class scientific and/or engineering process. It includes a Gantt chart. It has considered the risks and how the risks will be mitigated.
Score/Comments (DfT Use Only)		
4. How will the applicant exploit the output of the proposed project to deliver impact on DfT's priorities and UK transport? The applicant must clearly demonstrate how this grant would add value to the current situation.	30	The impact of the proposal is credible. It addresses several of the priorities. In terms of solution, it is plausible that it can be used to significantly improve the UK transport system. There is an exploitation route that shows how value could be delivered. There is significant interest from the DfT policy team in this proposal. There is a deployable solution.
Score/Comments (DfT Use Only)		
5. Project finances. Does the project demonstrate value for money?	10	The costs are fully justified and appropriate (reflecting fair market value), there is sufficient detail in the explanation of their breakdown. Staff costs are clearly defined with the rates used being reasonable. Other costs, such as materials, are clearly specified.
Score/Comments (DfT Use Only)		
TOTAL MAXIMUM SCORE IS 100		