

Funding for Innovation: Connected Vehicle Data



Department
for Transport

Application Form

The level of information provided should be proportionate to the size and complexity of the scheme proposed. As a guide, we would suggest around 10 to 15 pages including annexes would be appropriate.

A separate application form should be completed for each scheme.

Applicant Information

Local authority name(s)*: Essex County Council

**If the bid is a joint proposal, please enter the names of all participating local authorities and specify the lead authority*

Bid Manager Name and position: Alastair Southgate, Transportation Strategy Manager

Contact telephone number: 07585 909494 **Email address:** Alastair.Southgate@essex.gov.uk

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When authorities submit a bid for funding to the Department for Transport, as part of the Government's commitment to greater openness in the public sector under the Freedom of Information Act 2000 and the Environmental Information Regulations 2004, they must also publish a version excluding any commercially sensitive information on their own website within two working days of submitting the final bid to the Department for Transport. The Department for Transport reserves the right to deem the business case as non-compliant if this is not adhered to.

Please specify the web link where this bid will be published:

<http://www.essexhighways.org/highway-schemes-and-developments/bids-and-funding.aspx>

SECTION A - Scheme description and funding profile

A1. Scheme name: Vehicle Informed Asset Management

A2. Headline description:

Please enter a brief description of the proposed scheme (in no more than 250 words)

Essex County Council (ECC) is proposing to use vehicle generated data to improve the quality and ease of collection of road condition data and to develop more cost effective capital maintenance programmes. The data collected will relate to highway condition, including accelerometer, traction control and temperature. The proposal will develop an application to analyse that data to determine whether it may be suitable for future asset management. Additionally, we will work with the asset management system supplier to determine how it could be automatically transferred to allow the system to generate early warnings.

Our Essex Highways strategic partner, RingwayJacobs, has already laid the groundwork with Daimler AG and Geotab, starting to develop a system which uses existing off the shelf or built-in technologies, to reduce risk and timescales for delivery. This proposal makes use of this data, either directly from Essex Highways Daimler vehicles or via Geotab units plugged into the OBDII ports of other Essex Highways vehicles.

Our proposal will allow raw data to be collected immediately from source, with ongoing analysis and improvements throughout the study period.

The outcome of the study will be the confirmation of data sets which can be effectively collected and analysed; the changes required for automated updates to existing databases; information on the potential time and cost savings of the system and; the potential expandability of the system to include further data. The key deliverable will be a prototype data analysis application, which can identify asset management issues from vehicle sensor data.

A3. Geographical area:

Please provide a short description of area covered by the bid (in no more than 50 words)

The geographical extents of this proposal will be the administrative boundary of Essex. Arrangements are in place to work with local district partners to assist with data collection within this area.

OS Grid Reference: N/A

Postcode: N/A

A map showing the proposed study area and major new housing and employment sites has been included below;

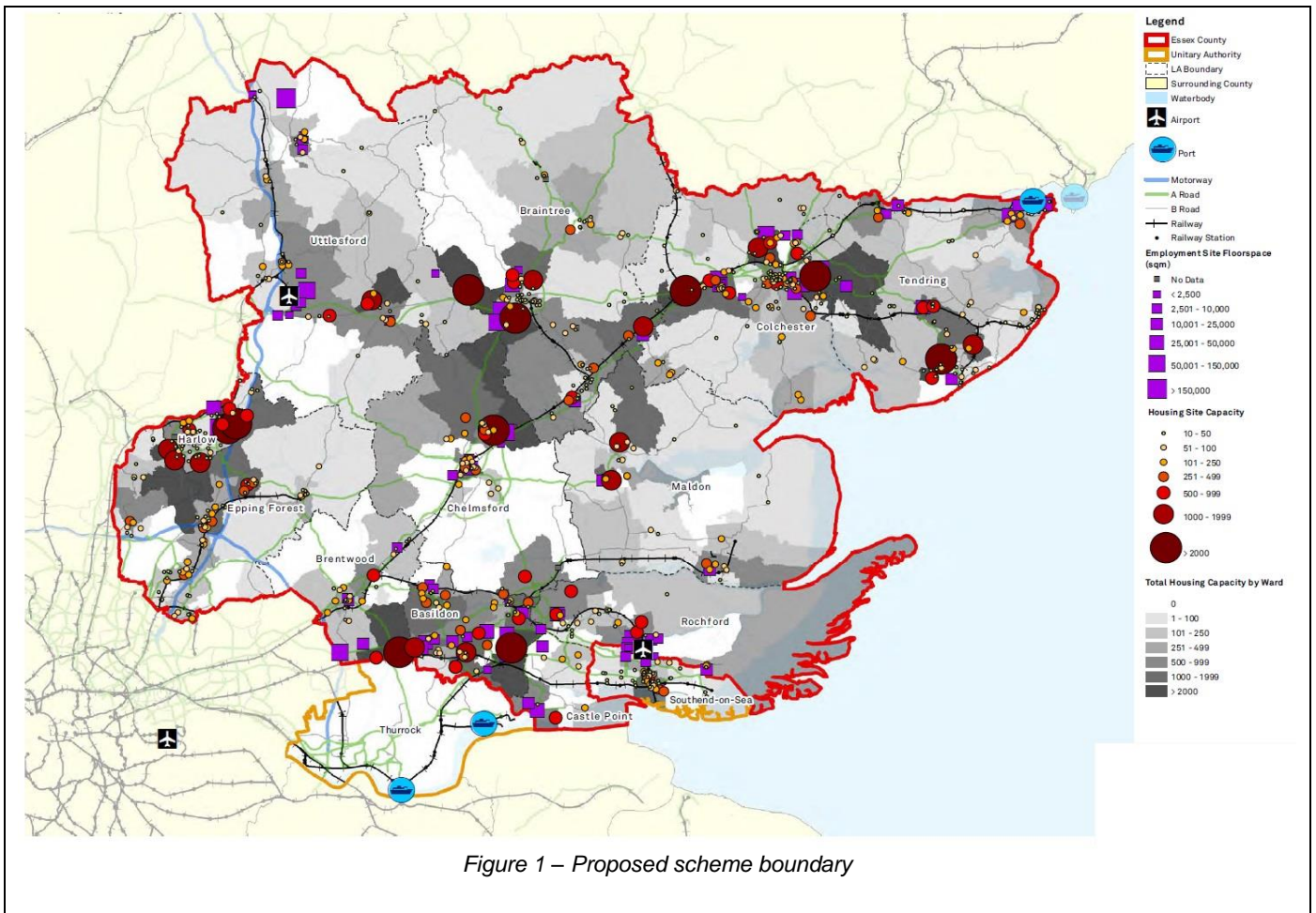


Figure 1 – Proposed scheme boundary

A5. Equality Analysis

Has any Equality Analysis been undertaken in line with the Equality Duty?

Yes, the standard Essex County Council Equality Analysis has been undertaken for this project and can be provided on request. For this proposal, the impacts for the project have been assessed as neutral.

SECTION B – The Business Case

B1. The Scheme – Summary/History (Maximum 300 words)

Please outline what the scheme is trying to achieve – indicate what data you expect to collect and your technological approach, what applications you will deliver from the connected data etc. This should also provide a clear statement on data privacy and security.

ECC proposes to investigate the effectiveness of using vehicle generated data in asset management. Our aim is to prove the concept of improving the quality and ease of collection of road condition data and to investigate how this data could lead to the development of more cost effective maintenance programmes.

Our supply chain of RingwayJacobs; Daimler AG and; Geotab, together with support from our asset management system provider, have established the initial groundwork to develop a system for vehicle based data collection which uses existing technologies, to reduce risk and timescales for delivery.



Utilising this new funding, data will be collected remotely from the latest Daimler vehicles in the Essex Highways fleet and Daimler has already updated firmware in preparation, as part of their commitment to this trial. Leased Geotab units will be plugged into the OBDII ports on other Essex Highways vehicles.

The trial will collect data related to highway condition and develop an application to analyse that data to determine whether it may be suitable for asset management in the future. Additionally, we will work with the asset management system supplier to consider how it could be automatically transferred to allow the system to generate early warnings.

Our proposal allows data to be collected, in partnership with other authorities, immediately from award, with ongoing analysis and improvements throughout the project. Data will only be collected from a core number of maintenance vehicles as part of this proof of concept, however, the timescales for collection over the full year should provide plentiful data.

Vehicle data, already collected and managed by Daimler and Geotab, will be anonymised before being passed to RingwayJacobs for analysis. At the request of ECC's Monitoring Officer, drivers of vehicles that collect anonymous data as part of this proposal will be consulted prior to commencement.

B2. The Strategic Case (Maximum 350 words)

This section should set out the rationale for making the investment and evidence of the existing transport problems.

In particular please provide evidence on the relevant questions/issues in the accompanying Competition guidance.

Supporting evidence may be provided in annexes – if clearly referenced in the strategic case.

This may be used to assist in judging the strength of your strategic case arguments but is unlikely to be reviewed in detail or assessed in its own right. So you should not rely on material included only in annexes being assessed.

What are the current problems to be addressed by your proposal?

Authorities face significant pressure to maintain roads to a high standard. In 2016/17, ECC permanently repaired over 6,000 potholes, at a cost of more than £3m. Obtaining early warning of deterioration means that lower cost interventions can be made, such as capital surfacing techniques to avoid/delay the need for revenue funding (pothole filling), in line with best practice on whole life asset management.

Specialist survey vehicles collect data annually, the results informing the repair programme. This is an expensive task, sometimes resulting in delays between deterioration of the asset and maintenance interventions. In addition to the specialist survey vehicles, staff carry out inspections more frequently (monthly on Priority Route 1 Roads) which therefore result in additional costs on maintenance budgets and an increase in safety risks to operatives.

What options have been considered and why does your approach to road condition provide the best solution?

Vehicle sensor data is an existing asset, which is not currently used for highway asset management. The proposal is therefore to collect vehicle sensor data to enrich and analyse, through an application, to enhance the information in the asset management systems and to determine what further work is required to enable automation of the import and analysis process. The ultimate aim would be to provide real-time information for time critical activities, such as salt spreading based on local temperatures and data from traction control systems.

What are the expected benefits / outcomes?

- Development of a data led asset condition tool that:
 - enriches and enhances our asset management information;
 - enables the development of a more effective capital maintenance programme;
 - Contribute to value management to supplement existing data in treatment models to assist in the prioritisation process.
- Reduced frequency of road inspections and associated reduction in costs
- Reduced risk to operatives who do not need to travel the network as regularly

Appendix B lists the proposed deliverables that will be completed as part of these proposals

What is the impact of the scheme?

Provision of frequent asset data, allowing timely interventions and potentially reducing the frequency of on road surveys of the whole network.

How will you transform the data into intelligence?

The project will deliver an application that analyses the vehicle sensor data to identify potential asset management issues and alert operators to allow for further investigation. Combined with other asset management information, for instance from annual surveys, this data can provide intelligence of new or worsening asset issues.

B3. The Financial Case – Project Costs

Before preparing a scheme proposal for submission, bid promoters should ensure they understand the financial implications of developing the scheme (including any implications for future resource spend and ongoing costs relating to maintaining and operating the asset), and the need to secure and underwrite any necessary funding outside the Department for Transport’s maximum contribution.

*Please complete the following tables. **Figures should be entered in £000s** (i.e. £10,000 = 10).*

Table A: Funding profile (Nominal terms) – Details of costs included in Appendix B

£000s	2018-19	Total
<i>DfT Funding Sought</i>	61.56	61.56
<i>LA Contribution</i>	3.24	3.24
<i>Other Third Party Funding</i>	<i>Daimler self-funded</i>	<i>Daimler self-funded</i>

Notes:

- (1) Department for Transport funding must not go beyond 2018-19 financial year.
- (2) A local contribution of 5% (local authority and/or third party) of the project costs is required.

B4. The Financial Case - Local Contribution / Third Party Funding

Please provide information on the following points (where applicable):

- a) *The non-DfT contribution may include funding from organisations other than the scheme promoter. Please provide details of all non-DfT funding contributions to the scheme costs. This should include evidence to show how any third party contributions are being secured, the level of commitment and when they will become available.*

The only financial input, other than from DfT, will be from ECC and is from the existing 2018/19 allocated budgets.

Daimler has already undertaken firmware updates to allow the data to be collected and has committed to providing support to enable and further enhancements required. This will be self-funded by Daimler, through their innovation fund, so whilst the costs cannot be quantified, it is expected that this is a significant contribution.

- b) *Where the contribution is from external sources, please provide a letter confirming the body's commitment to contribute to the cost of the scheme. The Department for Transport is unlikely to fund any scheme where significant financial contributions from other sources have not been secured or appear to be at risk.*

Have you appended a letter(s) to support this case? Yes No N/A

- c) *Please list any other funding applications you have made for this scheme or variants thereof and the outcome of these applications, including any reasons for rejection.*

None

B5. The Financial Case – Affordability and Financial Risk (maximum 200 words)

This section should provide a narrative setting out how you will mitigate any financial risks associated with the scheme.

Please provide evidence on the following points (where applicable):

- a) *What risk allowance has been applied to the project cost?*

Costs for leasing Geotab equipment are fixed.

Jacobs' standard costing methodology has been used. A risk allowance of 15% has been added to the non-fixed items and risks will be managed through the project by amending the scope of the data analysis to optimise outputs.

- b) *How will cost overruns be dealt with?*

We will actively manage potential cost overruns. The overall scope of the project can redefined/reassessed to manage cost overruns. Ultimately, ECC will cover any overrun costs.

- c) *What are the main risks to project delivery timescales and what impact this will have on cost?*

Risks related to securing partners and budgets have been mitigated by arranging these in advance. The partners are aware of the deliverables and the project has been scoped to fit within the timeline. Daimler has already provided firmware updates to allow the relevant data to be collected remotely. Geotab uses open platform software and has identified the changes they will make to allow the necessary data collection.

The main risk is in collecting meaningful data from a small number of vehicles, however, the timescales should provide sufficient data to prove the concept and for the development of methods to transfer the data to an asset management system. Our technology partners enable us to commence data collection immediately upon award; reducing the risks and; potentially enhance the outcomes due to their capabilities to adapt during the project lifecycle.

B6. The Economic Case – Value for Money (maximum 200 words)

Bidders are requested to provide qualitative description of the data that will be collected from the project and how these could provide potential benefits going forward.

This should also capture any examples which generate revenue from the data collected and an indication on the number of users that benefits

Local authorities face significant pressure to maintain roads. Early warning of deterioration of surfaces means that lower cost interventions can be made. Poor road surfaces also contribute to higher vehicle running costs. Current programming of repairs uses data collected infrequently and generally by using specialist survey vehicles.

The project aims to collect anonymous vehicle sensor data as a proof of concept that this can enhance existing asset management and improve on traditional data collection methods. The data will relate to pavement condition, such as potholes; expansion joints and; skid resistance. This proof of concept could also be expanded to live temperature data, which, together with traction control data, could be used to determine salt spreading requirements.

The project will benefit our Asset Management team, who will use the data alongside data collected through traditional methods, to understand the condition of the network, prioritise and redistribute resource, link to other data collection trials (e.g. use of digistreet in Essex) and with the ultimate aim of replacing manual data collection. This live data would reduce the risk to personnel and costs associated with current collection methods, whilst allowing more rapid repairs of defects, to minimise potential damage or risks to motorists.

It is not expected that the data collected as part of the scheme will generate revenue.

B7. The Commercial Case (maximum 200 words)

This section should set out the procurement strategy that will be used to select a contractor and, importantly for this fund, set out the timescales involved in the procurement process to show that delivery can proceed quickly.

What is the preferred procurement route for the scheme? For example, if it is proposed to use existing framework agreements or contracts, the contract must be appropriate in terms of scale and scope.

**It is the promoting authority's responsibility to decide whether or not their scheme proposal is lawful; and the extent of any new legal powers that need to be sought. Scheme promoters should ensure that any project complies with the Public Contracts Regulations as well as European Union State Aid rules, and should be prepared to provide the Department for*

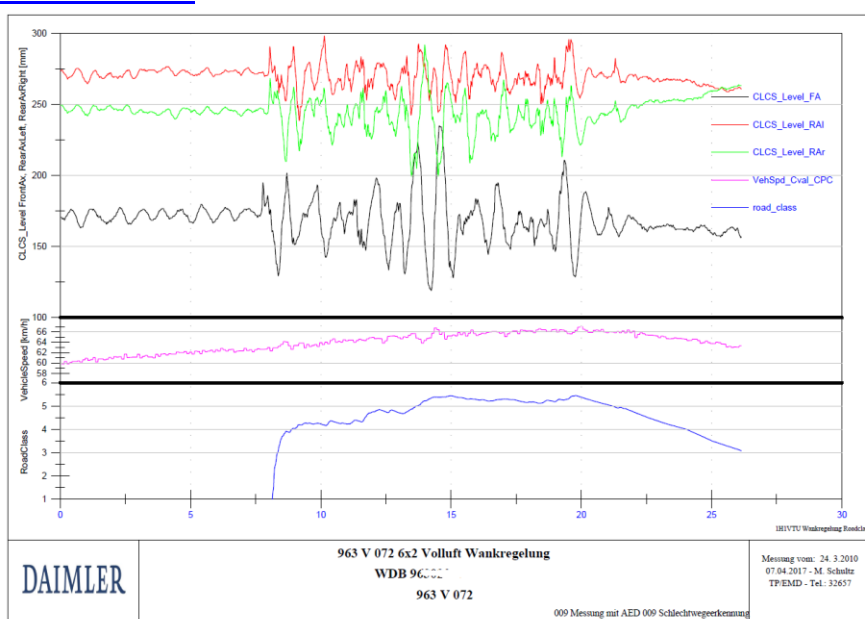
Transport with confirmation of this, if required.

An assurance that a strategy is in place that is legally compliant is likely to achieve the best value for money outcomes is required from your Section 151 Officer below.

The main contractor for this work is our Essex Highways service provider, RingwayJacobs. They will be employed through a task order arrangement between ECC and RingwayJacobs which can be issued at short notice. Jacobs UK Ltd will be employed on a Purchase Order arrangement. Non-disclosure agreements are already in place between Jacobs, Daimler and Geotab.

Daimler will self-finance their support to the project through their innovation fund and have already engaged in providing data, as shown in the graphs below, displaying axle deflection data. Further detail of Daimler's involvement in the VIAM proposal is included on their website:

<http://media.daimler.com/marsMediaSite/en/instance/ko/new-working-methods.xhtml?oid=17122261>



Credit: Daimler AG
Figure 2 – Axle deflection data

Geotab units will be leased at standard commercial terms by RingwayJacobs with Geotab then offering additional development support, as required.

A prototype application will be developed for use in the study, which can be used for ongoing vehicle data analysis after the study period, if ECC determines a benefit to the process and continues to subscribe for data collection.

B8. Management Case - Delivery (maximum 200 words)

Deliverability is one of the essential criteria for this Competition and as such any bid should set out if any statutory procedure are needed before it can be delivered.

No statutory procedures are necessary for this scheme as the inspections are undertaken meeting the obligations placed on the local authority under the Highways Act. We are not collecting data we would not normally collect only the form of the data differs.

a) An outline project plan (typically in Gantt chart form) with milestones should be included as an annex, covering the period from submission of the bid to scheme completion. The definition of the key milestones should be clear and explained. The critical path should be identifiable and any contingency periods, key dependencies (internal or external) should be explained.

Has a project plan been appended to your bid? Yes (Appendix A)

b) A statement of intent to deliver the scheme within this programme from a senior political representative and/or senior local authority official.

Senior engagement has been secured throughout the planning of this project, which has already involved a variety of stakeholders culminating in the commitment through the declarations by Senior Responsible Officer (Director of Highways & Transportation) and S151 Officer on behalf of the Authority (and project partners) in section D below.

The proposals within this bid have been approved and endorsed by Cllr Ian Grundy, Cabinet Member for Highways at the Highways Portfolio Board.

B9. Management Case – Governance (maximum 300 words)

Please name who is responsible for delivering the scheme, the roles (Project Manager, SRO etc.) and set out the responsibilities of those involved and how key decisions are/will be made. An organogram may be useful here. This may be attached as an Annex.

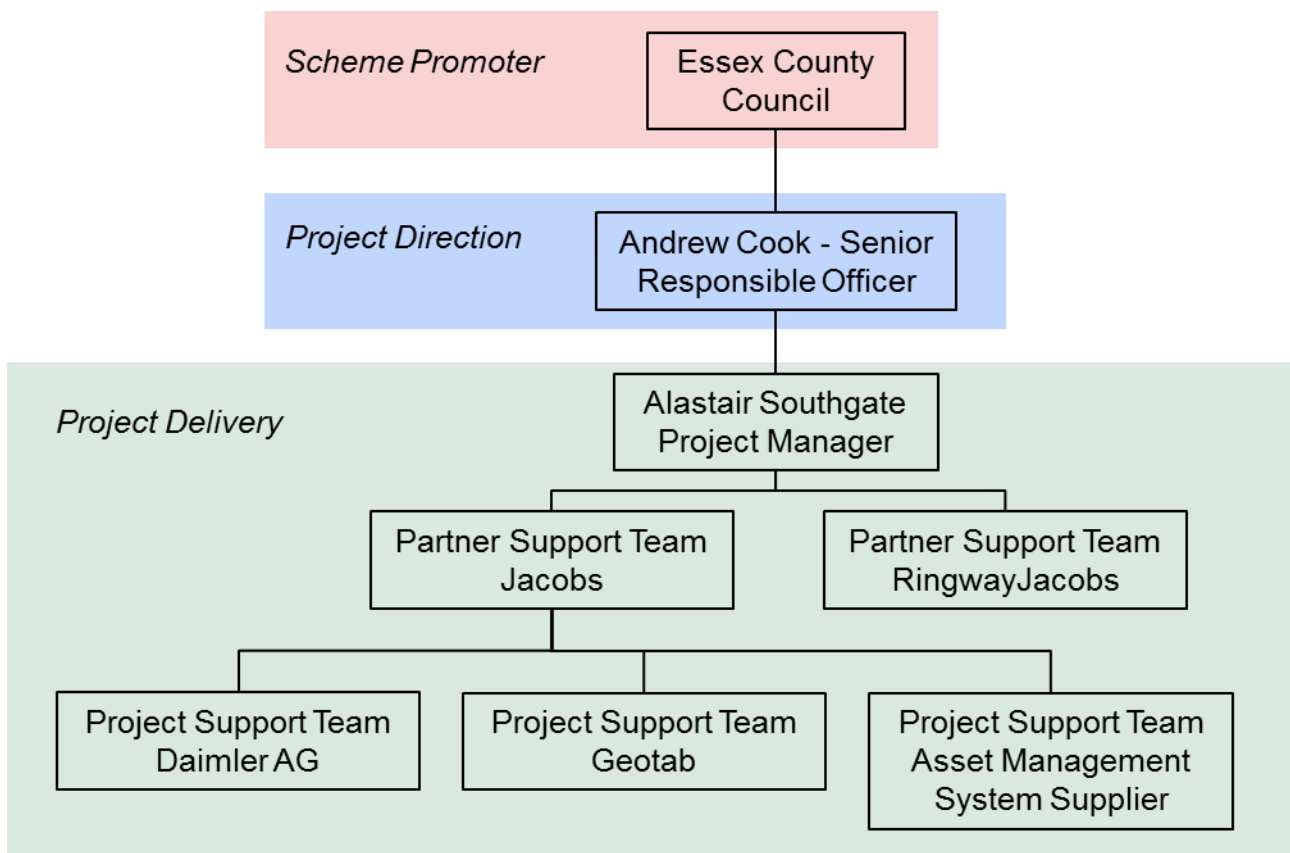


Figure 3 – Project Organogram

Regular progress reports will be submitted to the Project Manager and Director, Highways and Infrastructure for discussion at Essex’s Technology Strategy meetings. Decisions or changes required during the delivery of this proposal will be made in agreement with the Senior Responsible Officer at these meetings.

B10. Management Case - Risk Management

Risk management is an important control for all projects but this should be commensurate with cost. A risk register covering the top 5 (maximum) specific risks to this scheme should be attached as an annex.

Risk Management

A proactive risk management procedure is in operation which ensures that risks are continuously identified, owners assigned and mitigation measures put in place. Regular reviews check the status of each risk and regulate their control and mitigation. Project procedures also require that should the likelihood or severity of risks be identified as increasing by this process, responsibility for its mitigation is escalated upwards through the project management chain to ensure that this is achieved. In addition, ECC uses a proprietary online Risk Register to assess levels of risk and to track the progress of the strategy for the scheme.

ECC will bear all risk for the project as part of its role as project promoter

Has a risk register been appended to your bid? Yes (Appendix C) ~~No~~

SECTION C – Monitoring, Evaluation and Benefits Realisation

C1. Benefits Realisation (maximum 250 words)

The Competition is seeking to build up the business case for the relevant technologies and use cases. Please provide details on the profile of benefits, and of baseline benefits and benefit ownership and explain how your will lead to the outputs/ outcomes. This could be achieved by logic maps, text descriptions, etc.

We also request that your bid clearly articulates how you are expecting to use the data collected and the expected benefits for both road users and road operators. Please also outline how you could measure the expected benefits from the application of the harvested data.

Early warning of deterioration of pavement surfaces means that lower cost interventions can be made, improving value for money and reducing the impact on motorists. Automating data collection can also reduce the need for asset condition surveys, reducing revenue costs and the associated disruption and risk.

The project will review whether vehicle sensor data can provide timely input to an asset management system, to enable early interventions, resulting in lower cost works; reduced roadworks; reduced disruption to motorists; improved journeys and; less damage to vehicles, saving in compensation costs.

Once the concept of vehicle data transfer and analysis is proven, this could be expanded to cover other asset information, such as skid resistance, where early signs of deterioration could help to reduce collisions or to fuse temperature and skid resistance data to determine salt spreading priorities.

Success for the project will be the collection and analysis of data to determine if vehicle sensor data can be used to supplement, and potentially replace, existing asset management data sources. A Data Validation Report will be issued as part of this project.

C2. Monitoring and Evaluation (maximum 150 words)

The Department intends to evaluate the competition and bidders are requested to support our evaluation activities through the provision of information. For example, we may ask you to complete a survey or take part in an interview. In particular we will be interested to gather your views on; the delivery process (e.g. have you delivered your proposal to cost and schedule and whether you have encountered any barriers to delivery); the technology implemented (eg did it work as intended); the data collection process (e.g. do you have confidence in the data collected?); and how the data has been used/how are you planning to use it?

ECC will work with DfT to evaluate the project and consider future applications. This proposal will provide a scoping report for future applications based on the success of the analysis of harvested data.

SECTION D: Declarations

D1. Senior Responsible Owner Declaration

As Senior Responsible Owner for Essex County Council I hereby submit this request for approval to DfT on behalf of Essex County Council and confirm that I have the necessary authority to do so.

I confirm that Essex County Council will have all the necessary powers in place to ensure the planned timescales in the application can be realised.

Name:
Andrew Cook

Signed:

Position:
Director, Highways and Transportation

D2. Section 151 Officer Declaration

As Section 151 Officer for Essex County Council I declare that the scheme cost estimates quoted in this bid are accurate to the best of my knowledge and that Essex County Council

- has allocated sufficient budget to deliver this scheme on the basis of its proposed funding contribution
- will allocate sufficient staff and other necessary resources to deliver this scheme on time and on budget
- accepts responsibility for meeting any costs over and above the DfT contribution requested, including potential cost overruns and the underwriting of any funding contributions expected from third parties
- accepts responsibility for meeting any ongoing revenue requirements in relation to the scheme
- accepts that no further increase in DfT funding will be considered beyond the maximum contribution requested
- has the necessary governance / assurance arrangements in place
- has identified a procurement strategy that is legally compliant and is likely to achieve the best value for money outcome
- will ensure that a robust and effective stakeholder and communications plan is put in place.

Name: Margaret Lee (S151 Officer)	Signed:
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<p>Submission of bids:</p> <p>The deadline for bid submission is 23.59 on 16 February 2018.</p> <p>An electronic copy only of the bid including any supporting material should be submitted to: TRAFFIC.COMP@dft.gsi.gov.uk</p>
