

Work Package Scope

Detector Documents – Data Analysis, Review and Update

1. Introduction

Highways England (HE) is looking to procure consultancy services to carry out data analysis, review and authoring of Requirements and Advice (RAD's) documents following deployment of different forms of vehicle detectors.

HE has recently introduced a process that enables suppliers to undertake requirements and performance self-certification (MCH 1529) in order to ensure at-market detector will provide a safe and fit for purpose method of detection whilst maintaining the integrity of input to HE system and applications. We are also seeking to produce official advice and guidance to support scheme design.

The purpose of which is to support Designers when deciding on which detector or combination of detector to be used, taking into account installation and commissioning operational experience.

HE has gathered traffic data and video footage from a live evaluation site located on the network to validate and support the creation of the RAD. The site used Side Fire Radars, inductive loops, and DfT (ATC) loops all within close proximity which has produce a number of reports regarding supplementary information pertaining to detectors being used on the network.

The evaluation site is operational and will be providing further traffic data which needs to be collected and analysis so that it can be used to validate and support relevant information to be translated into requirements and advice including guidance.

This task will also support delivery of Action 82 of the Health and Safety 5 Year Plan which is to '*Continue to develop Requirement & Advice documents to improve design standards and to improve the effectiveness of road safety evaluations*'.

2. Background

Highways England (HE) has been using inductive loop detectors as it preferred choice for vehicle detection for many years and it has been the sole source of input to systems and applications such as the Motorway Incident Detection and Signalling (MIDAS) system.

To ensure that alternative forms of detectors installed on the network achieved the manufacturers' stated performance, a process (defined within MCH1529) was developed that enables suppliers to self-certify their product's performance. This is intended to facilitate the purchase off-the-shelf technology, and meet a primary objective of the HE traffic technology division's procurement strategy.

Following the introduction of new detector technology applied on smart motorways, documentation has been developed by Major Projects to assist designers. However, as experience has grown with the use of these detectors, there is an opportunity to

revisit the existing documentation and produce peer reviewed requirements and advice documents. This is similar to the process we followed for induction loops.

There is a programme of works which aims to co-ordinate and investigate further enhancement to the MIDAS system which uses vehicle detectors to provide outputs to various operational environments, such as: Smart Motorways (SM), Ramp Metering (RM) and traffic counting services.

Part of the programme included an evaluation to determine performance of detectors within a live operational environment and to consider other aspects such as whole-life costings.

The evaluation set out to determine if performance would vary given different installation parameters, and report back with the necessary data, intelligence to confirm that existing and alternative detection meets HE requirements and that commercially off the shelf (COTS) detectors are viable.

Stakeholders from Information Technology, Major Projects and Operations now have experience of designing, installing and commissioning new schemes using new detector technology. This experience can also be used to inform new RADs. Therefore the supplier will need to ensure that appropriate experts in the relevant domains are assigned to undertake the data analysis and development and creation of appropriate HE RAD's in order to meet the requirements of this task.

3. Requirements

- 1: To undertake additional data analysis to further validate and identify which key performance parameters need to be translated into RAD's.
- 2: Collation of all existing information and advice pertaining to recently deployed vehicle detectors in order to review, draft, and create robust RAD's, identifying any gaps.

3.1. Objectives

- a) Data analysis planning – Highways England has in its possession a significant amount of individual vehicle data and video following an evaluation of each form of detector. The supplier will be required to determine an appropriate methodology for the additional data analysis to determine if it is consistent with the previous work and ensure that the right questions regarding detector operational issues have been identified and can be appropriately transferred into RAD's where applicable.
- b) Review and Drafting – The supplier is required to undertake a stakeholder identification and engagement process in order to identify all available reports, documents, and information to ensure the robustness of the analysis has answered the right questions. It will also need to identify any knowledge gaps which need to be filled before drafting or updating any advice and guidance documents. The supplier will need to adhere to HE MDD guidance regarding the document structure.
- c) Draft review – The supplier will be required to prepare for and attend meetings with relevant stakeholders presenting the first drafts and findings and collect

feedback to inform further development of the requirements and advice documents.

- d) Supporting documentation – The supplier will develop a GD 04 risk assessment and an equalities impact assessment (where required) to support the submission of relevant advice and guidance
- e) Project closedown – The supplier will be required to produce supplementary presentation materials (Presentations do not form part of the task) to be used for future educational sessions aimed at Highways England Project Sponsors and Supply Chain Design staff.
- f) Presentation materials shall be in the format of a Microsoft Power Point presentation and accompanying hand-out. Where possible information should be sent electronically. A short lessons learnt report shall also be included as part of the project closedown.

3.2. Work Required

Task 1 - Project initiation and management

Task 2 - Data analysis & investigation

Task 3 - Review and Drafting

Task 4 – Stakeholder (peer review) review and supporting documentation

Task 5 - Project closedown / Lessons learnt

Task 1 – Project initiation and management

An inception meeting will be held between the key members of the proposed team and the Project Sponsor (PS) as soon as practicable after task award. The aim of this meeting is to clarify governance relating to: project management, financial control, Benefit Cost Ratio Form, monitoring progress, task reporting, and performance management.

The meeting shall identify the following outcomes:

- Keeping the project to schedule in terms of:
 - Time
 - Financial expenditure
 - Quality
 - Resource planning
- Keeping the client team informed of:
 - Progress
 - Changes to the programme
 - Risks and issues

Deliverables

- Project Initiation Document, prepared and approved (within 3 weeks of project commencement)
- Detailed overall Project Management Plan, including stakeholder management (within 3 weeks of project start)
- Delivery schedule (within four weeks of project start and updated monthly)
- Finance, contractors monthly reporting (CMR) and KPI (monthly)
- Completed Benefits Cost Ratio Form (BCRF)

Quality Expectations

- Document formats must be in accordance with a recognised project management methodology's guidelines
- The delivery schedule must readily show changes in delivery dates against time from start of project
- Invoicing must be within 10% of agreed monthly budget forecasts
- Outturn for the FY shall be within 5% of CMR at project start

Task 2 – Data Analysis & Investigation

Highways England has collected a significant amount of traffic and video information from an evaluation site located on its network with the intention to assess performance using DfT accredited (ATC) loop information as a benchmark.

The type of analysis which needs to be undertaken would not be full video analysis but video would be available to investigate or validated any anomalies and issues resulting from the data analysis.

The purpose of analysing and investigating is to provide answers to a number of question concerning performance and outputs of detectors at varying installation conditions and parameters, and how much did it vary in regards to the benchmark information. Also what affect any variation would have on devices connected to the MIDAS outstations via existing or new detector cards.

The data both previously collected and additional for analysis shall be treated as commercially sensitive and would require strict control and security between the project sponsor and supplier.

Process

The supplier will determine an appropriate method for undertaking the data analysis to ensure that analytical and statistic pitfalls do not mislead or distract the questions which need to be answered. The analysis will need to be easily transferred for further use and clearly show how findings have been derived. The type of questions the analysis needs to answer but not limited to are:

- What type of performance parameters cannot be asses from data analysis and why
- Which performance parameters or error occur as a result of various radar installation (setbacks and heights)
- Which performance parameters or error occur that will impact on system calculations

- Does the analysis robustly indicate which aspect of performance would not meet HE system or application requirements
- Can each form of detector output sufficiently to trigger safety features such as HIOCC/HIOCC2
- What percentage of errors or variation (excluding the baseline) would be acceptable from a system input or application perspective

The supplier will develop a methodology which best suits traffic technology analysis and understanding but also have input from a wider audience as a means of validation to ensure the analysis is robust. Following the development of the data analysis methodology it will need to be reviewed and agreed by the project sponsor.

Due to the amount and sensitivities of the data for analysis the supplier will need to make arrangement with the project sponsor on how best to transfer the data and backup/protect the information.

Quality Expectations

- Document formats must be in accordance with a recognised project management methodology's guidelines
- The project team will have access to technical support with experience of traffic management data analysis.
- The project team will have access to a statistical advisor with experience in handling datasets with context specific variations in measured error and uncertainties.
- It would be a client disappointment if the outcome of the analysis did not permit the Highways England to readily understand how results have been derived and presented.

Deliverables

- Data analysis methodology (30/05/18)
- Report of data analysis with conclusions (30/07/18)
- Delivery of appropriate presentation materials (17/09/18)

Task 3 – Review and Drafting

The purpose of undertaking a review is to identify current documents and information which can be used to create the necessary advice and guidance documents. There are a number of stakeholders such as Major Project (Smart Motorways), Traffic technology operations, and suppliers who will have certain information already produced. However it would not necessarily be in accordance with the type of guidance format and due diligence which would be required for an official HE publication.

Therefore the contractor will need to assess all available information which can be transferred to develop a first draft set of Advice and Guidance documents.

Process

The contractor will need to identify and review all available information required to develop a first draft set of Advice and Guidance document. The approach should include but not limited to:

- Information mapping with rationale for transferring into advice and guidance.
- Establish critical conditions that if not met will result in a much reduced performance.
- Review Highways England publication sources for any applicable detector advice and guidance.
- Establish any gaps or uncertainties regarding information and determine what action is needed and prioritise.
- Develop a comments register to capture and manage feedback and actions

Quality Expectations

- Project team members will have access to technical support with experience of HE guidance and advice document production.
- The review and first draft will have been informed by a full range of design, installation and commissioning information and analysis which has been translated into guidance and advice for use by major projects and operations scheme designers.
- It would be a client disappointment if the information did not permit the reader to readily identify critical aspect needed for advice and guidance.

Deliverables

- Agreed format of comments and action register (30/04/18)
- Production of draft requirements and advice documents (13/07/18)

Task 4 – Stakeholder review and supporting documentation

Although stakeholder management is a function of good project management it is emphasised within this work package to ensure that relevant links and references are included with the RAD's documents. It will also form part of the due diligence required for official Highways England documents and needs to be demonstrated.

Process

A major part of the work will require extensive consultation within a wide range of customers, users and stakeholders, who are likely to raise risks/issues that need to be addressed before finalising the relevant documents. The contractor should consider a pragmatic yet robust approach which takes into account and includes but not limited to:

- Identification of relevant stakeholders
- Stakeholder communications plan
- Identification of relevant informative documents
- Identification of risk and equality impact assessments
- Undertake risk and assessment as and when appropriate
- develop a collaboration plan

- Update comments register and amend first draft.

This will enable core stakeholders to achieve appropriate internal endorsement and sign off and facilitate supporting information for what is known as the Quality Management Review (QMR) 1 and 2 process for publication.

Deliverables

- Final version of advice and guidance document (30/09/18)
- GD 04 risk assessment, equality impact assessment (30/10/18)
- Supporting document and presentation materials (30/10/18)

Task 5 - Project closedown / Lessons Learnt

To ensure the project is closed down in a controlled manner and there is an efficient handover. The supplier shall arrange the following deliverables:

- All data and documentation used to produce all reports.
- All reports in word (or equivalent) and PDF format.
- All databases and spreadsheets used to derive information from data.
- All visio (or equivalent) diagrams used in reports.
- Lessons learnt report

The lessons learnt report will be a reflection on the work carried out and identify:

- What could have been done differently
- Best practices that could be adopted in the future

Files shall be sent via email, where file size permits. Alternatively a USB memory stick shall be used.

4. Responsibilities

- Setting up an inception meeting within 15 working days of Task award;
- Setting up monthly progress meetings. These may be conference calls or face-to-face meetings as agreed at the inception meeting;
- Producing all reports in 'draft' format for review by the Highways England Project Sponsors, including any subsequent amendments in advance of issuing a 'final' report;
- Producing draft invoices and Contractors Monthly Reports in accordance with PS requirements;
- Producing and maintaining a programme for the Task, clearly detailing each sub-task and their interactions, identifying key dates and deliverables, to be agreed at the Inception Meeting;
- Producing and maintaining a project risk register, split into sub-tasks, to be agreed at the Inception Meeting and shared with the Project Sponsor and reviewed and updated monthly.

Deliverables

- As detailed above by (30/11/18)

5. Skills/Experience

The proposal must include details and previous experience of all key staff and demonstrate their combined ability as a project team to meet the essential and desirable requirements listed below. The proposal must also demonstrate what arrangements are in place to ensure continuation of support should there be a need to replace staff.

5.1. Essential Skills

- Data analysis with knowledge and understanding of Highways England traffic management system and applications
- Significant practical experience of Radar and inductive loop detection (as well as other forms of detection).
- knowledge of related DMRB documentation production;
- significant experience in Project Management including planning, executing and managing projects to fixed timetables and budgets;
- excellent communication and presentation skills;
- excellent report writing skills and the ability to produce high quality documents suitable for external circulation; and
- Knowledge and understanding of the MDD.

5.2. Desirable Skills

- Prior experience of working with Highways England.
- Previous research in this field.

6. Deliverables

Deliverable Number	Deliverable Description	Completion Date
1	Project Initiation documentation	3 weeks after award
2	Data analysis methodology	30/05/18
2	Report of data analysis with conclusions	30/07/18

2	Delivery of appropriate presentation materials	17/09/18
3	Agreed format of comments and action register	30/04/18
3	Production of draft RAD's and guidance documents	13/07/18
4	Final version of RAD's and guidance document	30/09/18
4	GD 04 risk assessment, equality impact assessment	30/09/18
4	Supporting document and presentation materials	30/10/18
5	Project Closedown	30/11/18

7. Additional information

In order to be able to access Highways England data, individuals will need to meet the strict security requirements and will be asked to complete a Baseline Personnel Security Standard (BPSS) form and Disclosure Scotland application. This will need to be done immediately to avoid any delays to the ability of the supplier to start work.

The supplier must ensure that the Project Sponsors are afforded sufficient time (two weeks minimum) to review and comment on any documentation.

The supplier is required to provide details of forecast monthly spend and draft invoices no less than 1 week prior to the end of each calendar month as part of a Contractor's Monthly Report.

The supplier's performance will be measured using the Highways England SPaTS CPF process against deliverable, milestone and reporting targets.

8. Location

There will be occasions where the supplier will need to attend meetings, such as monthly progress meetings, at Highways England's offices.

Travel will be based on rates laid down in the Framework. Time for travelling will only be paid for time that is in excess of the normal travel hours for the staff supplied. Where time for travelling on trains is claimed on invoices, the expectation is that work for this Task will be carried out, as far as is reasonably practical, during such journeys.

9. Timescales

Start date: March 2018

Duration: 12 months