

Highways England Company Limited

Smart Motorways Alliance

Scheme Scope

Study into the prevention and elimination of Utility / asset strikes

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Section A: Scheme Client Requirements

Introduction

The *Client* requires the provision of services from the SMA to support reducing the number of underground and over ground service strikes. Highways England wants to understanding root cause, using co-ordinated systems thinking approach which will support us in eliminating service strikes by 2025. This is a collaborative problem which the *Client*, utility companies and suppliers will work together on to identify solutions and actions.

The aim of this task is to work with Highways England and its suppliers and engage with utility providers, wider industry and academia to undertake research into understanding utility strikes and work with necessary partners suggesting solutions. The findings will be presented to the Supply Chain Safety Leadership Group (SCSLG), which promotes safe working practices, and will take a pivotal role in owning and directing this work and driving adoption of recommendations within Highways England and across the supply chain. The work will also involve engaging with the Industry Infrastructure Innovation Platform (i3P) and others, which will broaden the uptake of new practices and technology, accelerating industry change and meet the target of eliminating service strikes by 2025.

The proposal requires a review of current guidance and best practice with in depth research study completed, a document of current vs best practice in Highways England and the supply chain supported with an implementation road map and demonstration to be delivered. A balanced approach is required where we collaboratively work to improve working practices at all levels including Highways England.

Background

Construction work is one of the most dangerous jobs in the UK. Workers are exposed to many risks, including working with heavy on-site plant, hazards associated with buried assets, inaccurate or outdated plans and surveys, and the presence of daily traffic vehicle travelling close by.

The buried utility network in the UK is longer than the transport network with 353,000 km of sewers, 485,000 km electrical cables, 396,000 water pipes, 500,000 km drains and millions of km of street lighting, traffic signalling and telecom cables.

During delivery of construction projects when contact is made with utilities by plant or operatives this causes significant delays to customers by not completing works on time, damage to reputation and above all injury to our workforce. The reasons behind the continued prevalence of utility strikes are multiple and encompass behaviour, culture and process as well as technology. The introduction of improved utility detection on construction sites could bring significant benefits to safety and productivity of construction as the proportion of hours taken by pre/post shift briefings, investigations and even stopping work activities could be erased. If assets could be identified and action taken to prevent contact these risks.

Although there are specific PAS and Raising the Bar documents directing on procedures these are not consistently applied. fully adopted. Clients, suppliers and utilities must understand work together and understand the causes with a road map and action plan to eliminate service strikes why these are not embraced.

Highways England recognises that there is a need to stimulate the uptake of better practice and if technology can assist this should be investigated. In 2017 the Safety Engineering Standards (Innovations team) supported research to explore how automated technologies could improve excavation activities, in particular to reduce exposure of operatives to hazardous buried assets. This work demonstrated the potential safety and cost benefits of introducing technology to excavation. Over a period of time it was assessed service strikes and contact made with plant cost around £33 million.

Objectives

The aims are to understand why strikes occur and provide guidance on how these can be eliminated. A demonstration/test/trial will be undertaken which may seed the development of better working practice / technology and updated operational standards.

The objectives are:

- A co-ordinated role, reporting to the Supply Chain Safety Leadership Group (SCSLG) to ensure other elements of the work are part of a coherent approach that will successfully address service strikes.
- To support the delivery of a test/trial/ demonstration to showing to industry (Highways England, other clients and suppliers) the cutting edge of underground and over-ground asset detection, illustrating at a state-of-the-art technology Safety Assured Site of the future looks like. Affordability and ease to implementation in practice would need to be provided and a cost/benefit case.
- An agreed supply chain road map for elimination of utility strikes through implementation of the enhanced working practices.
- Consideration of current vs best practice and analysis data to produce a set of actions designed to minimise utility strikes over the next five years, to be agreed and delivered through SCSLG.
- To bring together a wide range of partners such as academia, utility providers, industry and working groups to work collaboratively in understanding the levels of performance, root causes behind incidents and provide a report that recommends tested and proven methods additionally understanding why current guidance is not adopted.
- Collaboration with i3P recognising the issue is one that affects multiple construction clients and common supply chain, and industry engagement is a means to drive more fundamental change.
- In support of the above, a robust communications strategy to maximise engagement and publicity.

 Highways England and supply chain developing measures to understand its level of risk and setting ongoing leading performance measures (beyond just the number of utility strikes)

Section B: Description of the works

The Scope comprises the Alliance Scope and the Scheme Scope. This document should be read in conjunction with the Alliance Scope.

S100 Description of the works

Task 1 – Root causes of utility strikes and proposals for change

This task will require extensive consultation with industry, academia, H&S executive, working groups, others and stakeholders to undertake a deep dive into incidents and provide a strategy that will assist in understanding why they occur and how to reduce asset strikes. This document(s) will be presented to Highways England's SCSLG and industry support and meet its target that operatives are not harmed whilst working on the strategic road network or associated sites by eliminating utility strikes by 2025. Findings will be prepared along with necessary presentations and briefing notes. Delivery of this Task will require the following sub-tasks:

Stakeholder engagement

This sub-task will establish a stakeholder group to support the development of the strategy for the report, delivery and implementation of appropriate working practices that will reduce asset and service strikes. The stakeholder group will guide and drive the delivery of the recommendations to be delivered in this task. The group will also support the overall governance of this Task, and of further development Tasks that may be commissioned.

The work required in establishing, implementing and supporting the stakeholder group will include:

- Establishing the membership (to include construction, plant and sensor providers, technology providers, academia etc., as appropriate) additional consultees to be included are i3P members.
- Supporting the development of the terms of reference.
- Organising meetings, including supporting decisions on attendees, developing the agenda, establishing clear objectives for each meeting etc.
- Providing secretariat support, including minutes, supporting and following up actions etc.

The consultant will also engage with a wider audience to promote the concept and development of enhanced working practices which include raising the bar guidance, site supervision and PAS documents. This will include:

- Engaging with further stakeholders (as agreed with Highways England) to promulgate this work, and encouraging engagement.
- Promotion and communication activities, as appropriate.
- Maintaining a watching brief on external requirements/influences and making sure these are addressed

Report(s)

The supplier will provide a summary report(s) of the findings to the SCSLG and a list of recommendations and improved working practices.

Contents of report(s) could include, but not be limited to: direct and indirect costs of incidents over the past 10 years, types of incidents, location, plant involved, construction activity, demographic of operative(s), supplier, root cause of incident, risk assessment discussions between designer and contractor, remedial action undertaken and jointly develop a comprehensive document that will enable Highways England to understand how we can better manage delivery. The report will also include looking at best practice outside UK and if these can be adopted. The findings will simulate discussion and understanding techniques on plant available to reduce this together with an understanding of why uptake is slow. This will ultimately provide a safer and more efficient environment for construction and maintenance schemes.

Task 2 – Demonstration of enhanced working practice

Highways England wants to demonstrate to industry, to clients including HE's own programmes solutions in which strikes can be reduced. Demonstrating cutting edge technology can open the path to change. The demonstration will support current best practice such as supervision and leadership. A report of the findings will be prepared along with necessary presentations and briefing notes. We want suppliers to demonstrate how this work can be part of business as usual and bring a safety assured site. A cost analysis of use technology against current practice will be prepared.

Delivery of this task will require the following sub-tasks:

Independent Review

The work under this sub-task will include:

- Through consultation with the stakeholder group, other external stakeholders, OEM's academics identify where construction techniques have been implemented and if technology can assist. This should not be limited to a national basis and should cover overseas. From discussions and research assessments shortlisted technologies will be followed up with practical review.
- Engage with the providers of the shortlisted technologies and undertake a practical assessment of its application. It is envisaged that this will take the form of interviews.

- Collate the results of the study and feedback on the observations, successes/failures and lessons learnt.
- Determine the approach to the demonstration event, including suitable location and publicity.
- Provide a report on "where to next" and "how to get there" to the stakeholder group and work towards a demonstration.

Exhibition Event / Site Demonstration

The objective of this sub-task will be to demonstrate to cross-industry audience in real world conditions the practical application of softer solutions, enhanced construction techniques and safety leadership and if required with support of construction technologies. If technology is used, this will assist in demonstrating and understanding how such technologies can assist in the delivery of improved performance, which may include (for example) reduced exposure of risks to site operatives, increased construction efficiency or improved quality outcomes and development of standards.

The work under this sub-task will therefore include:

- If required identify one or more current construction technologies for practical demonstration on a test site.
- Engaging with the provider(s) of the technology to agree participation in the demonstration, and the approach that will be taken. Note: it is assumed provider(s) costs for participation is covered by the provider(s).
- Identifying and establishing a test/development site, and preparing the site as required to facilitate the demonstration
- Designing and planning the demonstration
- Determining the outcome criteria, and any information that will be collected, to assess and demonstrate successful outcomes
- Facilitating the demonstration, monitoring and collecting any information that will be used to demonstrate outcomes.
- Feeding back on successes/lessons learnt to the stakeholder group
- Determining the content/level and type of publicity (liaising with other tasks) and facilitating with Highways England the publication of the outcomes.
- Providing a report on "where to next" to the client, stakeholder group, others; these reports will need to address the audience.
- Presenting to various bodies such as TRIB and i3P.
- Working with the provider(s) of the technology to design and plan the event, and facilitating the event.
- Feeding back on successes/lessons learnt to the Highways England, stakeholder group and others.

The Consultant is required to co-ordinate and co-operate with Others, including when preparing any deliverables. For example, co-ordinating the preparation of the

Connected Autonomous Plant (CAP) autonomy level matrix and test bed demonstration with relevant publications.

Task 3: Co-ordination and communication

In order to drive the changes to working practices to achieve the desired reduction in utility strikes, the consultant is required to co-ordinate and develop the research and demonstration sub-tasks as part of an overall approach to reduction in utility strikes and a roadmap to their elimination on Highways England sites by 2025. In doing so, the consultant should report regularly to the SCSLG and work alongside other members of Highways England's supply chain.

Communications

The communications around the project are critical in driving the desired culture change.

A robust communications strategy will be developed; and an efficient project plan will ensure internal and external parties are engaged and consulted. External and internal facing articles will be submitted to SES project sponsor for approval. Necessary leaflets including artwork, writing and sending invites and management will form part of this task.

The Consultant will need to consult and co-operate with the following organisations:

- all Statutory Bodies
- Other clients
- Supply chain (national/international)
- Other contractors
- Original equipment manufacturers
- Utility companies
- I3P and its members
- Others as the Client may instructed

S 200 General Constraints

The works must be complete by 31st March 2022.

- S201 S276 are applicable with the exception of: -
- S202 Parent company guarantee
- S241 Recovery Vehicles
- S256 Project Control Framework
- S268 Aftercare/management of landscape works

S300 Alliance's Design

Not applicable to this order

S400 Scheme Handover

S405, S410, S415 are not applicable to this order

S500 Programme

The works associated with this Scheme Order must be complete by 31st March 2022.

Deliverable Completion **Deliverable Description** Date (month) Number Task 1 – Literature review T1-1 1-12 Project management Select members for stakeholder group and T1-2 2 subgroup and establish group(s) Draft and Agree Terms of Reference for T1-3 <3 stakeholder group and subgroups Independent review T1-4 2-7 Stakeholder engagement 1-12 T1-5 T1-6 Communications 1-12 T1-7 1-12 Preparing & presenting Develop scope for further demonstration / T1-8 5-7 development Tasks Governance to further demonstration / development T1-9 3-7 Task Duration of T1-10 Other tasks project Task 2 – Demonstration T2-1 Project management 1-12 T2-2 Draft and agree terms of reference for community <3 Develop scope to further demonstration T2-3 1-12 development Governance and H&S around demonstration / T2-4 1-12 development T2-5 Independent review 1-12

Key deliverables are listed below

T2-7	Stakeholder engagement	1-12
T2-8	Design Review /Event/ demonstration	1-12
T2-9	Organise and attend visits to suppliers	1-12
T2-10	Engaging with task 1	1-12
T2-11	Prepare recommendations/documentation for further works	1-12
T2-12	Other tasks – tbc	1-12
	Task 3 – Co-ordination and communication	
T3-1	Project management	1-12
T3-2	Co-ordination and communication plan	1-12
Т3-3	Any other task – tbc	1-12

Milestone Key Dates

The following summarises the Milestone Key Dates for inclusion in the programme as detailed in the Implementation plan.

Milestone Key Date	Date
Scheme Completion	Thursday 31 st March 2022

S600 Quality Management

The alliance should manage health and safety correctly during investigation works and any potential overspend should be included on the early warning and risk register.

S700 Test and Inspections

Any applicable test and inspection requirements as required by the scope of works should be followed

S800 Management of the works

All management of the works requirements in the alliance scope should be followed.

S900 Working with others

Requirements should be followed as applicable to the scope of works.

S1010 Services and other things to be provided by the Client as a member of the Alliance

- Airs web data
- Asset data

S1100 Health and Safety

All health and safety requirements in the alliance scope should be followed.

S1200 Subcontracting

Requirements in the alliance scope should be followed.

S1300 Title

Requirements in the alliance scope should be followed.

S1400 Account and records

All account and record requirements in the alliance scope should be followed.

S1500 Commercial management

All commercial management requirements in the alliance scope should be followed apart from S1530 as earned value is not required.

S1600 Transfer of rights

Requirements in the alliance scope should be followed.

S1700 Information management

All information management requirements in the alliance scope should be followed

S2000 Project bank account

All project bank account requirements in the alliance scope should be followed

S2100 Client's work specification

As applicable to the scope of works

Allocation of Scheme Scope between Alliance Partners

KEY:

- Responsible The Lot Partner(s) responsible for delivering the activities as defined in the Alliance Scope
- **S**upport The Lot Partner(s) support the delivery of the requirements as defined in the Alliance Scope

The Alliance as a whole remains responsible for delivering the Scheme.

REFERENCE	The Client (as a member of the Alliance)	Lot 1 Fluor	Lot 2 Jacobs and WSP	Lot 3 Costain , Baflour Beatty and bmJV
SECTION A: LOT SCOPE				
S100 Description of the works				
S105 Introduction to Highways England				
S110 Introduction to the Smart Motorways Programme				
S115 The structure of the Alliance	R	R	R	R
S116 Alliance Objectives	R	R	R	R
S120 Core responsibilities of the members of the Alliance	S	R	R	R
S120A Production Management Partner		R		
S120B Digitally Enabled Design Partner			R	
S120C On-site Assembly Partner				R
S120D The <i>Client</i> as a member of the Alliance	R			
S130 Agile responsibilities of the members of Alliance				
Scoping of surveys				
Asbestos	S	S	R	S

REFERENCE	The Client	Lot 1	Lot 2	Lot 3
	(as a member of the Alliance)	Fluor	Jacobs and WSP	Costain , Baflour Beatty and bmJV
Communications	S	S	R	S
Condition	S	S	R	S
Drainage and ducting	S	S	R	S
Environmental and ecology (e.g. protected species)	S	S	R	S
Lighting	S	S	R	S
Noise	S	S	R	S
Pavement	S	S	R	S
Structures and geotechnical	S	S	R	S
Topographical	S	S	R	S
Carrying out of surveys				
Asbestos	S	S	S	R
Communications	S	S	S	R
Condition	S	S	S	R
Drainage and ducting	S	S	S	R
Environmental and ecology (e.g. protected species)	S	S	S	R
Lighting	S	S	S	R
Noise	S	S	S	R
Pavement	S	S	S	R
Structures and geotechnical	S	S	S	R
Topographical	S	S	S	R
Preliminary design				
Gantries, structures and bridges	S	S	R	S

REFERENCE	The Client	Lot 1	Lot 2	Lot 3
	(as a member of the Alliance)	Fluor	Jacobs and WSP	Costain , Baflour Beatty and bmJV
Noises and environmental barriers	S	S	R	S
Piling and foundations	S	S	R	S
Power and lighting	S	S	R	S
Retaining walls	S	S	R	S
Technology and communications	S	S	R	S
Detailed design				
Gantries, structures and bridges	S	S	R	S
Noises and	S	S	R	S
environmental barriers				
Piling and foundations	S	S	S	R
Power and lighting	S	S	R	S
Retaining walls	S	S	S	R
Technology and communications	S	S	R	S
Traffic management	S	S	S	R
Development of as- built records	S	S	S	R
Purchase and provision of				
Technology	R	S	S	S
Traffic management	R	S	S	S
Any other products and services called off from CCS and other <i>Client</i> framework contracts	R	S	S	S
Consent and administrative activities				
Statutory and consent management (e.g.	S	S	R	S

REFERENCE	The Client	Lot 1	Lot 2	Lot 3
	(as a member of the Alliance)	Fluor	Jacobs and WSP	Costain , Baflour Beatty and bmJV
Statutory instruments, Statutory Undertakers, Distribution Network Operators (DNOs))				
Environmental assessment	S	S	R	S
Customer service and external stakeholder management	S	S	S	R
Setting up and administering of PBAs	S	R	S	S
Supporting SMP delivery (e.g. Red-X campaign)	S	R	S	S
Production activities				
Logistics	S	S	S	R
Promoting use of off- site manufacture and standardisation	S	S	S	R
Continuous improvement and innovation	S	R	R	R
SECTION B: GENERAL REQUIREMENTS				
S200 General constraints				
S201 Alliance behaviours	R	R	R	R
S202 Parent Company Guarantee	S	R	R	R
S203 Conflict of interest	S	R	R	R
S204 Anti Bribery and Anti-Fraud	S	R	R	R
S205 Data Protection	S	R	R	R
S208 Official Secrets Acts	S	R	R	R

REFERENCE	The Client	Lot 1	Lot 2	Lot 3
	(as a member of the Alliance)	Fluor	Jacobs and WSP	Costain , Baflour Beatty and bmJV
S210 Confidentiality	S	R	R	R
S211 Insurance	S	R	R	R
S215 Security and protection of the Site	S	S	S	R
S220 Security and identification of people	S	R	R	R
S225 Protection of existing structures and services	S	S	S	R
S230 Cleanliness of roads	S	S	S	R
S240 Network occupancy	S	S	S	R
S241 Recovery services	S	S	S	R
S245 Condition survey	S	S	R	S
S250 Considerate Constructor Scheme	S	S	S	R
S251 Customer service	S	R	R	R
S256 Project Control Framework	S	R	R	R
S266 Energy Efficiency Directive	S	R	R	R
S267 Environmental requirements	S	S	S	R
S268 Aftercare / Management of landscape works	S	S	S	R
S269 Site Waste Management plan	S	S	S	R
S270 Sustainable development requirements	S	S	S	R
S272 Air Quality Strategy	S	S	S	R

REFERENCE	The Client	Lot 1	Lot 2	Lot 3
	(as a member of the Alliance)	Fluor	Jacobs and WSP	Costain , Baflour Beatty and bmJV
S274 Discrimination, bullying and harassment	S	R	R	R
S275 Equality, diversity and inclusion	S	R	R	R
S276 Employment and skills	S	R	R	R
S285 Behavioural attributes	R	R	R	R
S300 Design	S	S	R	S
S305 Design responsibilities	S	S	R	S
S310 Design criteria	S	S	R	S
S320 Design submission procedures	S	S	R	S
S325 Design approval from Others	S	S	R	S
S400 Scheme handover				
S405 Scheme Open for Traffic	S	S	S	R
S410 Scheme handover	S	S	S	R
S415 Scheme Completion	S	S	S	R
S445 Documents	S	S	S	R
S450 Access to information following Completion	S	S	S	R
S500 Programme				
S501 Alliance programme requirements	S	R	R	R
S502 Scheme programme requirements	S	R	R	R
S515 Scheme programme quality	S	R	R	R

REFERENCE	The Client	Lot 1	Lot 2	Lot 3
	(as a member of the Alliance)	Fluor	Jacobs and WSP	Costain , Baflour Beatty and bmJV
S520 Methodology statement	S	R	R	R
S525 Revised programme	S	R	R	R
S535 Earned value management	S	R	R	R
S600 Quality Management	S	R	R	R
S605 Alliance aligned/integrated management system	S	R	R	R
S610 Lean	S	R	R	R
S615 Quality planning	S	R	R	R
S620 Authorised persons with adequate skills, knowledge and experience	S	R	R	R
S625 Quality reviews	S	R	R	R
S626 Audits	S	R	R	R
S630 Registers	S	R	R	R
S640 Non-conformity corrective action reports	S	R	R	R
S645 Quality indicators	S	R	R	R
S650 Deliverables	S	R	R	R
S655 Alliance management review	S	R	R	R
S660 Quality management points	S	R	R	R
S665 Risk management	S	R	R	R
S700 Tests and inspections	S	S	S	R
S800 Management of the works				

REFERENCE	The Client	Lot 1	Lot 2	Lot 3
	(as a member of the Alliance)	Fluor	Jacobs and WSP	Costain , Baflour Beatty and bmJV
S810 Communications	S	S	S	R
S820 Disclosure requests	S	R	R	R
S825 Information security	S	R	R	R
S835 Business Continuity	S	R	R	R
S900 Working with Others	S			
S905 Requirements of Others	S	R	R	R
S920 Utilities providers	S	R	R	R
S1000 Services and other things provided				
S1010 Services and other things to be provided by the <i>Client</i>	R	S	S	S
S1100 Health and Safety				
S1105 Supply chain health and safety maturity matrix	S	R	R	R
S1106 Management of health and safety	S	R	R	R
S1107 Alliance's health and safety management system	S	R	R	R
S1108 Subcontractor's health and safety systems	S	R	R	R
S1111 Action to rectify breaches	S	R	R	R
S1112 Health and safety culture	S	R	R	R
S1113 Health and safety – exchange of information	S	R	R	R
S1114 Asbestos	S	S	S	R

REFERENCE	The Client	Lot 1	Lot 2	Lot 3
	(as a member of the Alliance)	Fluor	Jacobs and WSP	Costain , Baflour Beatty and bmJV
S1115 Health and safety advice	S	R	R	R
S1116 Health and safety inspections	S	R	R	R
S1117 Health and safety in construction	S	S	S	R
S1118 Incident investigation, reporting and follow-up	S	R	R	R
S1119 Incident statistics	S	R	R	R
S1121 Health and safety management audit	S	R	R	R
S1122 CDM compliance	S	S	R	R
S1123 Health and safety – charity-based incentive Schemes	S	R	R	R
S1124 Particular requirements on Subcontractors	S	R	R	R
S1125 Management of road risk	S	S	S	R
S1127 Substance abuse	S	R	R	R
S1128 Security	S	R	R	R
S1129 Employee safety	S	R	R	R
S1130 Fleet Operator Recognition Standard (FORS) Accreditation	S	S	S	R
S1131 Driving for better business	R	R	R	R
S1200 Subcontracting	S	R	R	R
S1205 Restrictions or requirements for subcontracting	S	R	R	R

REFERENCE	The Client	Lot 1	Lot 2	Lot 3
	(as a member of the Alliance)	Fluor	Jacobs and WSP	Costain , Baflour Beatty and bmJV
S1210 Acceptance procedures	S	R	R	R
S1300 Title				
S1305 Marking	S	S	S	R
S1400 Accounts and records	S	R	R	R
S1415 Form of documents to be retained	S	R	R	R
S1420 Records and audit access	S	R	R	R
S1425 Retention of records	S	R	R	R
S1500 Commercial Management				
S1505 Provision of cost information	S	R	R	R
S1510 Provision of price information	S	R	R	R
S1515 Cost verification	S	R	R	R
S1520 Invoicing	S	R	S	S
S1525 Forecasting	S	R	S	S
S1530 Earned value for assessment	S	R	S	S
S1600 Transfer of Rights				
S1605 Partner's rights over material prepared for the design of the works	S	R	R	R
S1610 Other rights to be obtained by the Alliance	S	R	R	R
S1700 Information management (Option X10)	S	R	R	R

REFERENCE	The Client (as a member of the Alliance)	Lot 1	Lot 2	Lot 3
		Fluor	Jacobs and WSP	Costain , Baflour Beatty and bmJV
S1705 Information management requirements	S	R	R	R
1S2000 Project Bank Account (Option Y(UK)1)				
S2010 Project Bank Account tracker	S	R	R	R
S2100 <i>Client</i> 's work specification	S	R	R	R
S2110 Drawings	S	R	R	R
Annex A Reference documents				
Annex B Form of Parent Company Guarantee	S	R	R	R
Annex C Insurance Tables	S	R	R	R
Annex D Alliance Inclusion Action Plan	S	R	R	R
Annex E Alliance Employment and Skills Plan	S	R	R	R
Annex F Special activities and requirements	S	S	R	S
Annex G Continuous improvement/lean minimum requirements	S	R	R	R
Annex H Quality improvement process	S	R	R	R
Annex I Information management requirements	S	R	R	R