

**Bid Pack**

**Annex 2 – Statement of Requirements**

Contract Reference: CCCC20B36 - Provision of National Underground Asset Register Programme - NUAR

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# PURPOSE

## The purpose of this procurement is to appoint a prime supplier to deliver a regional Minimum Viable Product (MVP) and a National Rollout of a secure data exchange platform providing a comprehensive, trusted and secure digital map of where buried assets are located. The services procured will also include engagement and data discovery with 600+ Asset Owners, a digital platform development, data transformation and ingestion solutions and feedback loops for data quality improvement. The programme aims to deliver value through supporting the reduction of utility strikes and mitigating serious injury or death by promoting safer working conditions and by providing efficiency and cost savings in existing data exchange, planning and on-site activities.

## The Requirement will be for thirty-seven (37) months, split into three segments of seven (7) months, twelve (12) months, and eighteen (18) months. Contract extensions will be required between the segments. The first two segments are focused on the design and build of the Regional MVP for London, the North East of England and Wales. This will be followed by the last eighteen (18) month segment where the solution will be enhanced and rolled out nationally.

# BACKGROUND TO THE CONTRACTING aUTHORITY

## The Geospatial Commission (GC), the “Customer”, was established in April 2018 by the government as an independent, expert committee responsible for setting the UK’s geospatial strategy and coordinating public sector geospatial activity.

## The Customer published the UK’s geospatial strategy in June 2020, setting out how the UK will unlock the power of location data. The strategy sets out a vision for how location data will create significant economic, social and environmental value. It aims to do this through driving insight, innovation and investment in geospatial capabilities and technologies in the UK, working across both the public and private sectors.

## The overarching objectives of the Customer are to increase economic growth and improve social and environmental outcomes by:

### Setting cross-cutting geospatial strategy, policy and data standards;

### Promoting competition within markets for geospatial data, products and services;

### Improving accessibility, interoperability and quality of data; and

### Improving capability, skills and resources to support the growth of new and existing geospatial businesses and improve public services.

# Background to requirement/OVERVIEW of requirement

## The estimated economic cost of accidental strikes on underground pipes and cables is £1.2 billion a year. Workers who strike gas pipes and electricity cables by mistake can also put themselves and others in danger of death or serious injury.

## The UK does not have a uniform process for Asset Owners to share their data, which means prior to excavating a site, operators are required to contact all organisations who own or may have owned assets in the area, wait for each to respond, then compile information so it can be read and understood by workers. This process is slow, inefficient and makes inaccuracies leading to accidental damage more likely.

## The Customer is seeking to unlock the economic opportunities offered by geospatial data, and estimates £245m in value could be unlocked for the UK economy per annum by creating a National Underground Asset Register (NUAR) where Asset Owners and their operators share data in a consistent and efficient manner.

## The geospatial economic opportunities in the infrastructure and construction sectors are estimated to amount to £2.2 - £4.6 billion per year[[1]](#footnote-2). In 2018, the responses to the Geospatial Commission’s Call for Evidence[[2]](#footnote-3) provided further support to focus on the lack of standardised and streamlined access to subsurface information.

## Further evidence and use cases surrounding buried infrastructure became available through a report issued by Project Iceberg[[3]](#footnote-4), a collaborative project between the Ordnance Survey, the British Geological Survey and the Connected Places Catapult.

## In 2019/20 the Commission conducted two pilots (one led by the Greater London Authority (GLA) in London, the other by Ordnance Survey (OS) in the North East of England) to validate assumptions related to the feasibility of creating a national data-sharing platform on the location and condition of buried pipes, ducts and cables to be used by Asset Owners and their supply chains. All major Asset Owners in the pilot areas across gas, water, sewage, electricity, telecoms, transport and local authorities took part by sharing data and carrying out use case testing.

## The pilots concluded in April 2020 and validated the assumptions that a NUAR platform is technically feasible and highly desirable by Asset Owners and their supply chains. A common data model and system architecture was implemented and all Asset Owners signed a common Data Distribution Agreement (DDA) in the pilot phase. Security, legal and commercial barriers were overcome by working closely with legal teams and the Centre for the Protection of National Infrastructure (CPNI).

## Since April 2020, the Customer has been completing necessary preparation work ahead of launching a competitive tender for a regional build and National Rollout. This involved continued stakeholder engagement, further development and refinement of the data model, additional use case testing and End User surveys.

## In June 2020, the Customer committed in the UK’s first Geospatial Strategy[[4]](#footnote-5) to preparing for the national rollout of NUAR. NUAR is also included in the National Infrastructure Strategy[[5]](#footnote-6).

## The use cases selected for this programme are strike avoidance and efficient project planning and data exchange. They represent the highest value to Asset Owners, planners and excavators, and deliver the widest societal benefit. The programme needs to deliver flexibility for additional use cases to be integrated into the platform and incorporating future services, contingent on the need and value of these additional services and cases being proven.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Use case** | **Value source** | **User needs** | **Reason** | **Data required** |
| **Safe digging** | **Utility strike avoidance** | ***Excavators* need to identify all possible underground assets** | **So that users can dig safely without striking an underground buried asset** | **XY coordinate data****Min info on material type, status (active vs. abandoned), pressure tier/voltage level****Z (depth) optional** |
| **On-site efficiency** | **Project efficiency savings** | ***Excavators* need to identify underground asset data in a single integrated view** | **So that workers can easily and efficiently orientate themselves on site** |
| **Site planning** | ***Project planners* need to identify the location and relevant attributes of all underground assets** | **So that accurate and comprehensive plans can be made to avoid project delays** |
| **Data exchange** | **Data exchange efficiency savings** | ***Asset Owners* need to share underground asset data through a central platform** | **So that Asset Owners can send and respond to data requests without maintaining their own data response systems/functions** | **Data in vector format (raster format as bare minimum) and in shareable condition** |

## The Customer is looking to appoint a prime supplier who will deliver the design and implementation of the system, as well as the necessary engagement, data discovery and transformation tasks including the support and maintenance of the platform.

# definitions

|  |  |
| --- | --- |
| **Expression or Acronym** | **Definition** |
| Acceptance Criteria | means a set of predefined requirements that must be met in order to mark a user story as complete |
| API | means an application programming interface (API) - a computing interface that defines interactions between multiple software intermediaries |
| Asset Owners | means statutory utility providers (gas, electricity, clean water, sewage, telecommunications and district energy networks) Local, Highways and Planning Authorities, and pipeline operators |
| BPSS | means Baseline Personnel Security Standard |
| Build Phase | means the phase of the programme that includes the delivery of the Regional MVP and the National Rollout, and it covers the duration of this requirement/contract |
| Core Platform | means the subsystem where the system data is stored and exposed to other subsystems via APIs, as described in Section 6.7.6 |
| CPNI | means Centre for the Protection of National Infrastructure |
| CTC | means Counter Terrorism Check |
| Data Exploration Agreement | means an agreement signed between the Supplier and the Asset Owner that allows the Supplier to access and store the Asset Owner’s data for exploration and mapping purposes solely in connection with the Supplier’s performance of its obligations, but not publication |
| Data Distribution Agreement, or DDA | means a data sharing agreement between the Customer and each Asset Owner allowing the storage, processing and publication of data for defined purposes  |
| Data Ingestion Specification, or DIS | means a specification defining the requirements for an Asset Owner’s supply of specified datasets in an agreed structure and format, at an agreed frequency, to the NUAR platform for the data to be transformed in the manner specified and documented during initial ingestion. |
| Data Model | means the data model as described in Appendix K - Data Model Description |
| Data Specification | means a document describing how data should generally be supplied in order to conform with the Data Model. An outline Data Specification is provided in Appendix M - Data Specification Outline |
| Data Transformation Platform | means a distinct component that allows Asset Owners to upload their source datasets in order to be transformed into a form compliant with the Data Model and loaded into the Core Platform via the Ingestion Subsystem |
| Delivery Unit | means the Customer's delivery structure as described in Section 17.4 |
| End Users | means users who interact with the user interface of the NUAR platform, as consumers and/or providers of the data that the platform exposes |
| GC | means Geospatial Commission |
| Ingestion Subsystem | means a subsystem of the Core Platform which allows transformed data to be loaded, checked and stored in the Core Platform data store. |
| MVP  | means Minimum Viable Product  |
| MVP Phase | means the phase when the Regional MVP production platform will be built. This is the part of the Build Phase |
| National Rollout | means the phase when the Regional MVP production platform will be scaled-up to a national level (the eleven regions specified in section 5.4) and at its end will be fully operational. This is part of the Build Phase |
| NCSC | means National Cyber Security Centre |
| NUAR | means National Underground Asset Register |
| OGC | means the Open Geospatial Consortium |
| Product Backlog | means the product backlog as presented in Appendix G - Product Backlog/User Stories |
| Product Owner | means the sole person responsible for managing the Product Backlog and signing off functionality as complete. The Product Owner is provided by Customer’s. |
| Programme | means the Geospatial Commission’s initiative to implement NUAR on a national level |
| Regional MVP  | means the MVP for the regions of London, the North East of England and Wales |
| Requirement | means the services that the Supplier will deliver as described in this document |
| Run Phase | means the phase of the programme when NUAR will become operational and that begins at the end of this requirement/contract |
| Scrum Master | means the facilitator of the agile framework and events with a focus on time-boxed iterations called Sprints |
| Sprint | means a time-boxed iteration of a continuous development cycle, which shall be three weeks, unless agreed otherwise and in advance of the relevant Sprint with the Customer |
| UAT | means User Acceptance Testing |
| UI | means User Interface |

# scope of requirement

## This requirement has been organised into four workstreams, which are:

### Asset Owner Engagement

### Data transformation & ingestion

### Development and user experience

### Cost recovery

## The supplier will deliver the following required outcomes (more detail is given in Section 6, The Requirement):

### Asset Owner Engagement workstream:

#### All Asset Owners are aware of NUAR, its benefits and what is expected of them.

#### All Asset Owners signed up to a Data Exploration Agreement, and they are ready to share their data for discovery purposes.

#### All Asset Owners are informed about the legal framework that is required for the NUAR and all Asset Owners are prepared to hold legal discussions with the Customer.

#### All Asset Owners have access to an information hub that contains all relevant information regarding the delivery of NUAR.

### Data transformation and ingestion workstream:

#### Asset Owners are making their data available for discovery and exploration purposes.

#### Asset Owners have agreed to provide regular refreshes of their data, in accordance with the minimum terms defined in the Data Distribution Agreements and the bespoke terms defined in an agreed Data Ingestion Specification.

#### After initial assistance by the Supplier to define data mappings, Asset Owners continue to provide data via the default Data Transformation Platform or have the option to transform their own data by using in-house capability or a third party supplier.

#### Asset Owners are receiving automated feedback on compliance and conformance of data provided through the transformation processes and are able to use this feedback to improve their data.

#### Transformation processes continue to align with the NUAR Data Model, as governed by the GC’s Data Model governance group and in accordance with OGC’s Model for Underground Data Definition and Integration.

### Development and user experience workstream:

#### A secure, robust access-controlled data-sharing platform is in place, which, for the purposes of safe digging, excavation planning and on-site orientation, allows End Users to view the location of underground assets against a base map [[6]](#footnote-7)showing roads and buildings as well as other information such as cross sections & supplemental drawings.

#### The platform includes an ‘observation’ feature, which allows excavators to report inaccuracies in data back to the Asset Owner or to report unidentified buried objects.

#### The platform is built on principles of extensibility, interoperability and scalability, keeping the door open for future use cases to be adopted as well as for the platform to link with other systems and interfaces.

#### Planners and excavators are accessing the new platform to plan and carry out excavations. They find it easy to use, both in the field and in the back office.

#### Excavators are using the ‘observation’ feature to report inaccuracies in the data, unidentified buried objects or other observations from the field. This is supported by a data management workflow and observations appear in the map user interface.

#### Asset Owners can upload data as well as expose data on demand via an API.

#### Sufficient safeguards are in place to protect data related to sensitive assets or sites. For some sites, Asset Owners are able to request further information from End Users prior to the data being exposed.

#### Asset Owners, security advisers, government departments and End Users have confidence that data is secure and is not being used or accessed except by authorised users for agreed purposes.

#### The platform utilises open technologies; it utilises tools and technologies that avoid vendor lock-in.

### Cost recovery workstream:

#### The Customer is able to obtain audit and usage reports to carry out cost recovery activities.

## A number of activities are necessary to deliver the required outcomes. The following is in scope of this requirement, including but not limited to:

### Asset Owner Engagement

#### Engagement planning and strategy;

#### Asset Owner engagement and support;

#### Refinement and issuing of Data Exploration Agreement enabling data discovery and exploration.

#### Provision of an information hub available to all Asset Owners

### Data transformation and ingestion

#### Finalisation and maintenance of the core Data Specification in collaboration with the Customer and Asset Owners;

#### Data exploration, modelling, mapping and feedback in collaboration with Asset Owners and industry groups;

#### Development and testing of data transformation processes;

#### Initial execution of data transformation;

#### Support to Asset Owner configuration of APIs;

#### Data transformation documentation, including full details for each Asset Owner of source data and mappings to the target Data Model, and agreed Data Ingestion Specification for repeat and sustainable data supply and transformation.

### Development and user experience

#### Solution architecture and hosting;

#### Solution build (cloud-based), including data repository, user interface and API integration;

#### System rollout support and management, including training, project documentation and guidance;

#### End user help desk.

### Cost recovery

#### Auditing and reporting.

## The geographical scope for this procurement is England, Wales and Northern Ireland[[7]](#footnote-8). The area in scope is divided in 11 regions, based on boundaries from the Office for National Statistics[[8]](#footnote-9): North East of England; North West of England; Yorkshire and The Humber; East Midlands; West Midlands; East of England; London; South East of England; South West of England; Wales; and Northern Ireland.

## The geographical scope for the Regional MVP is based on the three regions of North East of England, London and Wales. The other eight regions will be in scope for the National Rollout.

## The following items are out of scope of this procurement:

### Programme management;

### Public communications;

### Legal arrangements for the onboarding of Asset Owners;

### Sourcing of base map data;

### Outbound APIs to Asset Owner systems;

### Ingestion of as-laid drawing/survey data;

### Hardware, such as handheld devices;

### Geolocate technologies; and

### Decommissioning of legacy systems.

# The requirement

## NUAR aims to improve the efficiency and safety of underground works by creating a secure data exchange platform providing a comprehensive, trusted and secure digital map of where buried assets are located.

## The Customer wishes to procure design, implementation and integration services for the NUAR technical solution, as well as Asset Owner engagement and data discovery, and data transformation services. A lot of work has been done during the pilot and preparation phases to define the Customer’s technical requirements for NUAR.

## Alongside the workstreams that the Supplier is responsible for, the Customer will undertake an onboarding and legal workstream. This workstream aims put in place the legal, commercial, and management frameworks that are required for the Asset Owners to be in a compliant and comfortable position to share their asset location data under Data Distribution Agreements and for purposes described in standard End User terms (Appendix C). This workstream will interface closely with the Asset Owner Engagement workstream described in 6.5.

## Governance

### The Supplier will be fully integrated into the Customer’s Delivery Unit team, as described in section 17.4, Delivery Unit, and fully accountable for the delivery of this Requirement. The Customer will be accountable for the successful delivery of the NUAR programme overall and, therefore, will be the decision-maker.

### The Customer has developed established relationships with the pilot and preparation phase Asset Owners (North East of England and London). The Supplier will be expected to utilise these existing relationships.

### During the MVP Phase, the Supplier will co-convene and co-manage, with the Customer, regional and sector user groups, drawn from a broad Asset Owner community, which will include Asset Owners and End Users from the MVP regions and beyond. The purpose of the user groups will include requirements discovery, sharing experiences and feedback, discussing challenges and coordinating user testing. This list is not exhaustive.

### The Supplier will sit in the group of delivery partners for the NUAR programme. This group will be led by the Customer and, during the MVP Phase, will include the Greater London Authority, North East of England local authority leads and equivalent local or devolved government bodies from Wales.

### The Supplier will also sit in the Customer’s internal organisation governance structures, groups of external advisory specialists and other groups, as appropriate. Further detail is provided throughout section 6, The Requirement, and in section 17.4, Delivery Unit. The list of structures outlined in this document is not exhaustive and is subject to amendment.

## Asset Owner Engagement workstream

### The aim of this workstream is to establish a common understanding among the Asset Owners around the purpose of NUAR, its benefits and what is expected of them. It also aims to put in place Data Exploration Agreements between the Supplier and the Asset Owners, which allow for data sharing with the Supplier, data discovery and exploration.

### This workstream also covers the engagement with Asset Owners to ensure readiness to implement the required level of change in their organisations to fully embed the NUAR system.

### The Supplier will deliver a clear stakeholder engagement strategy for the 600+ Asset Owners across England, Wales and Northern Ireland. Details on the volumes of the organisations to be engaged are available in section 9, Volumes. A list of the majority of the Asset Owners across the country is available in Appendix A.

### The expected effort of engaging stakeholders and collecting their data is not consistent across the Asset Owners. Experience during the pilot and preparation phases indicated that the effort is proportionate to the size of the utility providers. Local authorities demonstrated little consistency in the way they manage and maintain information, therefore it is not expected that one approach will be appropriate for all local authorities.

### The Supplier will create a Data Exploration Agreement, which will be required to enable the Supplier to discover, explore and map – but not publish – Asset Owners’ data. The Customer will issue instructions to the Supplier concerning the use and permitted content of Data Exploration Agreements, and the Supplier will create a Data Exploration Agreement, which is identical, or broadly equivalent, to that set out in Appendix B. The Supplier will issue these Data Exploration Agreements and sign them with Asset Owners.

### The Data Exploration Agreements should be time limited (including that they should expire on or before the expiry of the contract), should expire as soon as a Data Distribution Agreement is signed between the Customer and the relevant Asset Owner, and should limit Supplier use of Asset Owner data received through data exploration to that which is strictly necessary for the Supplier’s performance of its obligations.

### The Data Exploration Agreements will not cover the legal framework for the data to be published on the Core Platform. This will be enabled by the Data Distribution Agreements between the Customer and the Asset Owners, the completion of which will be delivered in parallel by the Customer’s onboarding and legal workstream.

### The Supplier will inform the Asset Owners of the signing process of the Data Distribution Agreements and will introduce their high-level content to the Asset Owners, before handing over to the Customer to commence the signing-off process of the Data Distribution Agreements.

### When the Customer has achieved early sign off of the Data Distribution Agreements, the Supplier will not be required to sign Data Exploration Agreements, as the access to the Asset Owner’s data is covered by the Data Distribution Agreement.

### Regional MVP requirements

### The regional rollout of the MVP will be delivered in the North East of England, London and Wales. The Supplier will commence the engagement with Asset Owners as dictated by a priority order defined by the Customer (Appendix A). The Supplier will be responsible for finalising 'Group 4' of the MVP Asset Owner list (Appendix A) through confirming the coverage in the MVP Regions. The Customer will sign off changes to this list, including the deletion of Asset Owners, where no presence in the MVP regions has been definitively confirmed and evidenced.

### The Supplier will be responsible for delivering the following activities:

#### Asset Owner initial engagement;

#### Data Exploration Agreement sign-off (if applicable);

#### Introduction of Asset Owners to the Customer onboarding and legal process in a state of preparedness ahead of signing the Data Distribution Agreement with the Customer

#### Discovery of Asset Owners’ data;

#### Receipt and storage of data supplied by Asset Owners, under the terms of the Data Distribution Agreement or the Data Exploration Agreement, before proceeding with transformation;

#### Finalise ‘Group 4’ of the Asset Owner list (Appendix A);

#### Provision of an information hub that will hold all relevant and up-to-date information on NUAR and all Asset Owners will have access to.

### Some of these activities can be delivered concurrently. The length of and the effort for each activity depends on the Asset Owners’ size, circumstance and appetite.

### The Supplier will request information about the Asset Owners’ data and information management systems at the earliest stages of the engagement in order to inform the development and data transformation workstreams. This will include any data catalogues or data dictionaries the Asset Owners may already maintain about their data.

### The Data Exploration Agreements will be required to streamline the initiation of the Data Transformation process. The Supplier will be able to receive and assess the Asset Owners’ data under the terms of the Data Exploration Agreements if the Data Distribution Agreements are not signed early on.

### The Supplier will be responsible for facilitating discussions with the Asset Owners, acting on behalf of to the Customer and for ensuring that Asset Owners are in a state of preparedness to sign the Data Distribution Agreements with the Customer.

### The Supplier will provide information and assistance to onboarded Asset Owners' and End Users' organisations so that NUAR is embedded as business as usual for utility searches and data sharing, for planned and emergency works. The Supplier will enable access for all Asset Owners and End Users to the same level of information. Knowledge and information hubs, Customer Relationship Management system and forums should be considered for information exchange and Asset Owner engagement.

### The Customer has completed research to understand the current processes for seeking and providing information about underground assets by Asset Owners and End Users. The collated information is available in Appendix D. The Supplier will use the information provided for the purposes of sizing the effort required for the business transformation and provide the Asset Owners with the relevant support and information.

### The Supplier will conduct user surveys to measure user satisfaction and NUAR uptake in operations in the MVP Region, 3 and 9 months after the MVP delivery, as described in Key Milestones and Deliverables, Section 7.

### National Rollout requirements

### The Supplier will conduct a gateway review at an agreed point with the Customer during the MVP Phase with a lessons learned exercise, which will identify best practices. The Supplier will then produce the National Rollout detailed scope with embedded lessons learned and best practices, which will be approved by the Customer before implementation.

### As part of the National Rollout detailed scope, the Supplier will demonstrate the detailed engagement plan for the other eight regions. The Supplier shall respond to any engagement initiated the stakeholders of the eight regions during the MVP Phase. The learnings from early engagement will be taken into account into the National Rollout engagement planning.

### The Supplier will work with the Customer to agree the composition, grouping and prioritisation of the Asset Owner list, which will be included in the National Rollout detailed scope. The Supplier will propose a grouped, prioritised list of Asset Owners that incorporates lessons learned from the MVP Phase.

### The Supplier will issue a national call for participation to all Asset Owners in the other eight regions approximately 6 months prior to completion of the MVP.

### The Supplier will replicate the MVP Phase structures to the extent that they deliver best value and follow best practices, however, they will be scaled up in accordance with the needs for the National Rollout and the learnings from the MVP Phase. It is expected that some organic development and progress will occur during the MVP Phase and National Rollout.

### By the end of the National Rollout, the Supplier will have engaged with all Asset Owners across all regions. The requirements for Asset Owners being engaged by the end of the National Rollout are available in section 7, Key milestones and deliverables.

### Resources available

### Established stakeholder relationships, governance structures that include Asset Owners, users and relevant local authorities and external experts will be accessible through the programme governance structures. The Customer’s Stakeholder Engagement Lead will also be available to support this workstream.

## Data Transformation and Ingestion Workstream

### The Supplier will implement the Data Transformation Platform and Ingestion Subsystem, which provides the ability for data to be uploaded into the Core Platform.

### The Supplier will be responsible for developing data transformation modules to transform, or allow Asset Owners to transform, all datasets that are being ingested into the system from their source representation to the NUAR Data Model. The display of the transformed data in the Presentation Subsystem will be in accordance with the illustrations that are provided in the “Example Data Mappings” in Appendix E.

### The Supplier will be required to document and agree the Data Ingestion Specification with each Asset Owner in accordance with any instructions and/or guidance issued by the Customer, which may include items such as targets for the frequency of data upload by Asset Owners. The Data Ingestion Specification will be ‘live’ and updated as required to reflect agreed changes in data and supply from the Asset Owner. Each revision will supersede the previous version. The Data Ingestion Specification will build on the base compliance requirements for data supply, as defined in the Data Distribution Agreements, and document the specifics of supply, transformation and update arrangements for a specific asset owner.

### If Asset Owners elect to define and implement data transformation entirely using their own resources (which is not to be discouraged), the Supplier will retain responsibility for agreeing a Data Ingestion Specification (DIS) with these Asset Owners. The Supplier will notify the Customer workstream lead of these Asset Owners. If Asset Owners request and receive support from the Supplier for interpretation of the Data Model or for defining or implementing the data transformation process, the data transformation activity for this Asset Owner will be deemed to be the same as if the Supplier carried out the definition and implementation of data transformation themselves. The Supplier remains responsible for documenting the data transformation process in the Data Ingestion Specification and agreeing this with the Asset Owner.

### The Supplier will notify the Customer’s workstream lead as soon as possible in the event that significant obstacles to signing the Data Ingestion Specification still exist after three meetings with an Asset Owner.

### The Supplier will deliver to the Customer the source code of all data transformation workbenches and modules, developed using the data transformation technology selected by the Supplier.

### The Supplier will ensure that the data transformation and ingestion processes are sustainable over the long term in terms of costs and resources for 600+ Asset Owners. This consideration will include the design of data transformation processes such that they are transferable to Asset Owners for in-house execution (provided Asset Owners licence the equivalent data transformation technology as the Supplier uses to develop the processes).

### The Supplier will deliver the following documentation and ensure it is kept up-to-date throughout the life of the contract, including but not limited to:

#### A template for the Data Ingestion Specification which will allow the recording of the input requirements for repeatable and sustainable data supply and conformance requirements, including update frequency, for each Asset Owner;

#### Documentation describing the details of the data transformation for each asset owner, including full description of inputs and outputs, and the mapping between them, for review and approval by the Asset Owner; and

#### A completed Data Ingestion Specification for each Asset Owner describing the input requirements for repeatable and sustainable data supply and conformance requirements including update frequency.

## Development and User Experience Workstream

### The Supplier will develop the platform towards a Regional MVP allowing early operational use in the MVP regions. The Regional MVP will be the basis for scaling up geographically to a full National Rollout.

### The Customer has defined an Architecture Blueprint outlining the preferred architectural principles, the anticipated relationships between the elements of the system and the high-level component view, available in Appendix F.

### The functional requirements of the solution are represented as high- level user stories in the form of a Product Backlog, available in Appendix G. The Supplier, together with the Customer, will refine the high-level backlog into granular user stories as the project progresses.

### Non-functional requirements for the solution are listed in Appendix H.

### The Supplier will produce and keep up-to-date the following documentation throughout the life of the contract, which will be subject to regular review by the Customer and in the event of significant changes:

#### System Architecture Design document (with reference to the Architecture Blueprint);

#### Data Transformation and Ingestion Subsystem Architecture Design document;

#### Security Controls and Security Architecture documents;

#### Integration Design Document, including:

##### Integration between the Core Platform and the Data Transformation Platform and Ingestion and Presentation Subsystems;

##### Architecture for handling inbound APIs and external API requirements, with reference to specific requirements and recommendations (Appendix I) and the NCSC SaaS Guidance[[9]](#footnote-10);

##### Integration of existing APIs for “reference” data relevant to the safe excavation use case.

### Core Platform

### The Core Platform is the part of the system where the system data is ingested, stored and exposed to other subsystems via APIs, subject to security controls and role-based access constraints implemented in the core platform.

### The Supplier will implement the Core Platform APIs in line with standards and best practice, for example:

#### OGC Web Feature Service 2.0[[10]](#footnote-11) for provision of attributed spatial vector data;

#### OGC Web Map Service 1.3[[11]](#footnote-12) or OGC Web Map Tile Service 1.0[[12]](#footnote-13) for provision of spatial raster data;

#### The Supplier should monitor the maturity of the emerging OGC API - Features[[13]](#footnote-14) standard and assess the feasibility of implementing for the provision of attributed spatial vector data in order to future proof the system;

#### The Supplier should implement RESTful APIs, in line with best practice guidance[[14]](#footnote-15), for the exposure of other core functions including:

##### User Accounts (login, administration)

##### Observations (Submission, Response, Management)

##### Enquiries (Submission, Authorisation and Administration)

##### Data Management and reporting

##### Automated data loads - full refresh and incremental

##### Data validation

##### Audit Reporting

### This list is not exhaustive.

### The Supplier will produce and keep up-to-date the following deliverables throughout the life of the contract:

#### API specification documents, with RESTful APIs being specified in an OpenAPI-compliant format.

#### Data Model

### The Supplier will implement the Data Model, which will conform to the NUAR Data Model Principles (included in Appendix J) and should conform to the NUAR Data Model definition (described in the Data Model Description in Appendix K) unless agreed otherwise in advance by the Customer.

### The Supplier will implement, as required, any extensions to the Data Model, which should conform to the draft OGC MUDDI standard as defined in the 2019 Engineering Report[[15]](#footnote-16), except by explicit approval from the Customer.

### The Supplier will be a member of the Data Model governance body, which will provide expertise, guidance and decision-making powers with respect to Data Model development and evolution during the project. The Customer will define the precise composition and Terms of Reference for this governance structure ahead of project kick-off.

### The Supplier will deliver NUAR Data Model revisions as required and agreed by the Customer during the course of the project, to satisfy new modelling requirements and to allow conformance with MUDDI Core model revisions. The changes to the NUAR Data Model that the Supplier will propose will be subject to governance processes that will be defined by the Customer.

### The Supplier will, with coordination by the Customer, consider and review during the duration of the project the high-level backlog of potential changes to the Data Model, which is included in Appendix L. This backlog will evolve and change during the project under the guidance of the Data Model governance body.

### The Supplier will develop the core Data Specification, which should be based on the NUAR outline Data Specification (included in Appendix M) and will include a Feature Catalogue summarising the mandatory and optional Feature Types, attributes and codelist values for different sectors and domains.

### The Supplier will provide designs for other required data structures for elements of the system outside the scope of the core NUAR Data Model including:

#### User Account and Security data;

#### Data Management information - metadata relating to organisations and datasets;

#### Supplemental data and documents;

#### Raster data;

#### Observations data; and

#### Intermediate storage of data during data load activities via the Transformation Platform and Ingestion Subsystem.

#### This list is not exhaustive.

#### Presentation Subsystem

### The Supplier will deliver the Presentation Subsystem, which encapsulates the user interface for all users of the system and integrates with the Core Platform via an API.

### The Supplier will deliver the user interface, which will be a web-based application with no requirement to download or install software locally.

### The Supplier will ensure that the application has a responsive design such that it is configurable for use on devices with different screen sizes and resolutions, including desktop computers, tablets and smartphones.

### The Supplier will ensure that the web application supports recent versions of the major web browsers, as outlined in document “Designing for different browsers and devices”[[16]](#footnote-17), and the supported versions of the major operating systems on desktop and mobile devices (Windows, Android, iOS).

### The Supplier will ensure that they deliver the high-level requirements for the user interface, which are presented in the form of a Product Backlog (Appendix G) and covers the following broad areas:

#### Area of Interest mark-up

#### Attribute Query

#### Audit

#### Conformance Reporting

#### Coverage Reporting

#### Data Load

#### Data Management

#### Intention to Dig

#### Layers

#### Link share

#### Login

#### Map navigation

#### Observations management

#### Observations submission

#### Print/Export

#### Request to View

#### Search

#### Security Notifications

#### Sensitivity

#### User Administration

#### User Notifications

#### Visualisation

### This is not an exhaustive list

### The Supplier will deliver the following documentation, which will be kept up-to-date throughout the life of the contract, including but not limited to:

#### User Interface (UI) Specification:

##### Sitemap

##### Screen layouts

##### Display Rules (including UI mappings from the Data Model)

##### Messages and Notifications

##### Links

#### Symbology and Cartography definition;

#### UI element Style Guide (accessibility, buttons, text, links etc); and

#### Product Backlog (in conjunction with GC Product Owner).

## Cost Recovery Workstream

### The Customer aims to develop and deliver a cost recovery scheme for the Run Phase of NUAR. The Supplier will keep a record of the effort required to maintain, host, update and upgrade the NUAR Platform, to regularly refresh the asset information, to manage change in the Data Model and to review the End User terms. The records will be shared with the Customer to inform the development of the cost recovery model. The Supplier will include this in their exit strategy.

## Skills Transfer and Training

### The Supplier will ensure appropriate training on the use of the platform is provided to the following groups:

#### End Users accessing the data exposed by the platform; and

#### Asset Owners transforming and uploading data to the platform.

### The Supplier will deliver the following documentation to the Customer and ensure that it is kept up-to-date throughout the life of the contract:

#### An End User training strategy and plan;

#### A handover to support strategy and plan;

#### A user manual for End Users;

#### Training materials for train the trainer sessions, including End User Security Briefing material, to be produced in consultation with CPNI;

#### Materials for Data Model familiarisation sessions; and

#### A Data Transformation “Adoption Pack” template suitable for the handover to Asset Owners of all documentation and materials required to perform in-house execution of data transformation.

## Delivery approach requirement

### The Supplier will adopt a delivery approach appropriate to each workstream and will agree the approach(es) with the Customer prior to commencing work. The approach(es) will enable:

#### Value to be delivered to End Users at the earliest opportunity;

#### Input and feedback from stakeholders, End Users and others to be elicited and incorporated back into the programme on a continuous basis;

#### Lessons learned and project findings to be reviewed and acted upon and best practices to be embedded;

#### Robust quality controls to be put in place;

#### Efficient use of resources, including use of staff time and skills;

#### Effective communication within and across each workstream;

#### Oversight and direction by the Customer (including budget monitoring and project controls); and

#### Effective running of the NUAR Delivery Unit, made up of the Supplier, Customer, Local Government and subject matter experts working together as one team.

### Platform development: the Supplier will use agile software development methods and practices to develop, implement, test and enhance the NUAR platform and will do so in line with best practice. The Supplier may wish to consider approaches such as scrum framework and dual track approaches. To mitigate against faux-agile practices, it has been suggested that dual-track agile sprints are adopted whereby discovery work to refine user stories (including prototyping and wireframing) and user research is conducted alongside software development on an ongoing basis.

### https://lh6.googleusercontent.com/TtNqxm6IL7G5v4epZGape3M96xMGt0Sk7y5Rf16gewaGSpQahLHIHogiL_vSxSZnhmqv6-S08BaQza3jlDUl5hy6gWLAnAu3YJq2QhlJOyuCJaZju6OUwewKHduChR065d31Lcnt

### The Customer’s Product Owner will own, maintain and sequence the product roadmap and backlog, and the Customer’s Scrum Master will oversee the Sprints. The Supplier will ensure all user stories are confirmed as ‘ready for development’ and are prioritised into a development sprint by the Product Owner prior to implementing them. The Customer’s Product Owner will sign off all user stories as ‘done’ prior to being closed.

### The Customer will further define, in collaboration with the Supplier upon appointment, the definitions of ‘ready for development’ and ‘done’, which will include but is not limited to the following elements:

#### Ready for development

##### User story follows the format “As a… I want to… So That…”;

##### User story can be delivered in a single sprint;

##### Acceptance Criteria are clear and concise (Gherkin format is preferred);

##### User story has been reviewed by relevant SMEs, business and/or stakeholders as required;

##### User story has been reviewed by relevant members of the development team as required.

#### Definition of Done

##### All unit and regression tests are passed

##### All Acceptance Criteria have been tested, passed and are closed;

##### UAT has been conducted by the Customer and passed with all Acceptance Criteria validated;

##### User story ‘So That’ outcome has been delivered.

### Sprint cycle

#### The Customer will group the development work into building blocks. The Product Owner will maintain a product roadmap, which sets out at a high level the sequencing of these groupings. The Product Owner will also sequence the product backlog and commit user stories to development.

#### All user stories will be estimated in terms of effort prior to being committed to development. Agile story pointing is preferred. This will be a collaborative activity, involving the Customer’s Product Owner and Scrum Master, the Supplier’s developers and the Supplier’s discovery leads.

#### If the Dual Track Sprint approach is adopted, the Supplier’s discovery leads will be responsible for refining assigned user stories each sprint so that they are ‘ready for development’. The Supplier’s Development leads will be responsible for implementing and testing user stories so that they meet the definition of ‘done’.

### Acceptance testing requirement

#### The Supplier testing team will evaluate the feature against the acceptance criteria before authorising promotion to the UAT environment, subject to the Customer’s approval.

#### Once in the UAT environment, the Customer’s Product Owner and selected representatives from the Customer and from the user community will be responsible for evaluation against the Acceptance Criteria.

#### The Customer’s Product Owner will be responsible for signing off the user stories as “done” once UAT has been completed and Acceptance Criteria met.

#### The Supplier’s development and test teams will be responsible for unit testing during development, and for full regression testing prior to any release to the Production environment. Incorporation of some automated testing is recommended.

### Other delivery approaches may be adopted by the Supplier to deliver the Asset Owner Engagement and Data Transformation and Ingestion workstreams as appropriate.

## Supply chain requirements: the Supplier will develop and demonstrate a supply chain that provides the required expertise, resilience and sustainability and adherence to security requirements to deliver the Requirement outlined in this document. Where applicable, the Supplier will detail the use of Subject Matter Experts and Small/Medium Enterprises in proposed supply chains. In addition, the Supplier will detail which elements of the supply chain will be in place on award of the contract and which elements, if any, are envisaged to be contracted by the Supplier following contract award including details of how such sub-contractors will be sourced e.g. via Supplier’s own dynamic purchasing systems.

## Vendor Lock-In

### The Supplier will deliver the Requirement outlined in this document in a manner that avoids vendor lock-in, a situation wherein the solutions and services adopted make switching from one technology or provider to another in the future unnecessarily difficult, time consuming or disproportionately expensive for the Customer.

### The Supplier will ensure the Customer is made aware and has approved of any lock-in implications related to the technologies, services and processes adopted and will do so in advance of implementing them. This will include:

#### Technical decisions which may rely on doing things in a certain way, thus excluding other vendors in the future;

#### Use of, or tight integration with, provider-specific services or products;

#### Solutions or services which require specialist skills not readily available in the wider market;

#### Data migration implications should the technology or service be replaced by another provider;

#### Data migration implications of documentation maintained on the Supplier’s systems (such as the product backlog, testing results, knowledge hub, etc.);

#### Data Exploration Agreements and associated Data Ingestion Specification and/or licences.

### It is recognised that it is impossible to avoid technical lock-in completely. In respect of technologies and services that may have lock-in implications, the Supplier will require prior written approval from the Customer before proceeding with such technologies and services. The Supplier will provide the Customer with all necessary details of the lock-in implications of such technologies and services to enable a decision by the Customer. The Supplier will keep a written record of Customer approvals, which record will be made available to the Customer upon request. At the Customer’s sole discretion, the Customer may provide the Supplier with criteria that allow for deemed consent to the development of certain technologies and services without requiring prior approval by the Customer.

# key milestones and Deliverables

## The Supplier will deliver the following deliverables and milestones listed below and the Supplier’s performance will be monitored against these. The Supplier will define further deliverables and milestones, with the Customer’s agreement, prior to the start of the National Rollout phase. Where the deliverables are documents, the Supplier will be required to maintain and update these documents, as appropriate. The Supplier and the Customer will be reviewing the updates on the documents on a bimonthly basis.

|  |  |  |  |
| --- | --- | --- | --- |
| **Ref** | **Deliverable** | **Production date** | **Work stream** |
| 1 | Set-up of the development team is in place and has commenced development work on the platform, ways of working and scrum events are defined and scheduled, development environments set-up. | Within 1 month of contract award | D |
| 2 | Engagement strategy for MVP Asset Owners (document) | Within 1 month of contract award | AOE |
| 3 | Product Backlog - first iteration | Within 1 month of contract award | D |
| Gateway Review A – Within 3 months of contract award |
| A1 | Sprint velocity established and used to plan / estimate sprint cycles | Within 3 months of the contract | D |
| A2 | First platform release (to be defined and agreed on during the scrum events) | Within 3 months of contract award | D |
| A3 | System Architecture Design document (with reference to the Architecture Blueprint) | Within 3 months of contract award | D |
| A4 | Security Architecture Document | Within 3 months of contract award | D |
| A5 | Integration Design Document  | Within 3 months of contract award | D |
| A6 | API Specification Documents | Within 3 months of contract award | D |
| A7 | Core Data Specification including Feature Catalogue | Within 3 months of contract award | D |
| A8 | Materials for Data Model familiarisation sessions | Within 3 months of contract award | D |
| A9 | Data Design document: User Account and Security data | Within 3 months of contract award | D |
| A10 | Security Controls document  | Within 3 months of contract award | D |
| A11 | Data Ingestion Specification template | Within 3 months of contract award | T |
| A12 | Exit strategy document - for six month exit, including records as per 6.8.1 | Within 3 months of contract award | CR |
|  |
| 4 | User Interface Specification | Within 4 months of contract award | D |
| 5 | Symbology and Cartography definition | Within 4 months of contract award | D |
| 6 | UI element Style Guide | Within 4 months of contract award | D |
| 7 | Data Design document: other data structures  | Within 4 months of contract award | D |
| Gateway Review B – Within 6 months of contract award |
| B1 | 60% of Asset Owners in Group 1, 40% of Asset Owners in Group 2, 30% of Asset Owners in Group 3 have signed the Data Exploration Agreements | Within 6 months of contract award | AOE |
| B2 | Interim Engagement strategy for National Rollout - lessons from MVP engagement to date | Within 6 months of contract award | AOE |
| B3 | End User training strategy and plan | Within 6 months of contract award | D |
| B4 | 30% of Asset Owners in Group 1, 20% of Asset Owners in Group 2, have agreed the Data Ingestion Specification and have their data ready to be exposed through the platform | Within 6 months of contract award | T |
| B5 | Data Transformation and Ingestion Subsystem Architecture Design  | Within 6 months of contract award | D |
| Gateway Review C – Within 9 months of contract award |
| C1 | Platform assessed against the GDS Service Standards and ‘met’ | Within 9 months of contract award | D |
| C2 | 99% of Asset Owners in Group 1, 80% of Asset Owners in Group 2, 60% of Asset Owners in Group 3 have signed the Data Exploration Agreements | Within 9 months of contract award | AOE |
| C3 | 60% of Asset Owners in Group 1, 40% of Asset Owners in Group 2, 30% of Asset Owners in Group 3 have agreed the Data Ingestion Specification and have their data ready to be exposed through the platform | Within 9 months of contract award | T |
| Gateway Review D – Within 12 months of contract award |
| D1 | National call for participation to the National Rollout | Within 12 months of contract award | All work streams |
| D2 | Engagement strategy for National Rollout - lessons from MVP engagement | Within 12 months of contract award | All work streams |
| D3 | First API is connected to NUAR and providing an “on-demand” data feed | Within 12 months of contract award | T |
| D4 | 99% of Asset Owners in Group 1, 2 and 3 have signed the Data Exploration AgreementsThe list of Asset Owners in Group 4 is finalised | Within 12 months of contract award | AOE |
| D5 | 99% of Asset Owners in Group 1, 80% of Asset Owners in Group 2, 60% of Asset Owners in Group 3 have agreed the Data Ingestion Specification and have their data ready to be exposed through the platform | Within 12 months of contract award | T |
| D6 | System Architecture Design document - Major review and revision for regional rollout | Within 12 months of contract award | D |
| D7 | Security Controls and Security Architecture Document - Major review and revision for regional rollout | Within 12 months of contract award | D |
| D8 | Integration Design Document - Major review and revision for regional rollout | Within 12 months of contract award | D |
| D9 | Core Data Specification and Feature Catalogue - Major review and revision for regional rollout | Within 12 months of contract award | D |
| D10 | Product backlog -Major review and revision for regional rollout | Within 12 months of contract award | D |
| D11 | Strategy and plan for the handover of platform to the support function  | Within 12 months of contract award | D |
| D12 | User manual for general users | Within 12 months of contract award | D |
| D13 | Training materials for train the trainer sessions, including End User Security Briefing material | Within 12 months of contract award | D |
| D14 | Materials for Data Model familiarisation sessions - Major review and revision for national rollout | Within 12 months of contract award | D |
| D15 | Data Design document: User Account and Security data - Major review and revision for regional rollout | Within 12 months of contract award | D |
| D16 | Data Design document: other data structures - Major review and revision for regional rollout | Within 12 months of contract award | D |
| D17 | Data Transformation “Adoption Pack” template | Within 12 months of contract award | T |
| D18 | Data Transformation and Ingestion Subsystem Architecture Design - Major review and revision for regional rollout | Within 12 months of contract award | D |
| D19 | Security Controls document - Major review and revision for regional rollout | Within 12 months of contract award | D |
| Gateway Review E – Within 15 months of contract award |
| E1 | National Rollout detailed scope | Within 15 months of contract award | All work streams |
| E2 | 99% of Asset Owners in Group 1, 2 and 3 have agreed the Data Ingestion Specification and have their data ready to be exposed through the platform | Within 15 months of contract award | T |
| E3 | Exit strategy - Amendment for 18 month exit, including records as per 6.8.1 | Within 15 months of contract award | CR |
|  |
| 8 | 99% of Asset Owners in all 4 groups have signed the Data Exploration Agreements | Within 16 months of contract award | AOE |
| Gateway Review F – Within 18 months of contract award |
| F1 | 99% of Asset Owners in all 4 groups have agreed the Data Ingestion Specification and have their data ready to be exposed through the platform | Within 18 months of contract award | T |
| F2 | Regional MVP is operational in all three regions (North East of England, London, Wales) | Within 18 months of contract award | All work streams |
| F3 | 99% of Asset Owners in groups 1, 2 and 3 in the MVP Regions are refreshing their data to agreed minimum frequencies | Within 18 months of contract award | T |
|  |
| 9 | Launch of National Rollout | Within 19 months of contract award | All work streams |
| Gateway Review G – Within 21 months of contract award |
| G1 | 99% of Asset Owners in all 4 groups in the MVP Regions are refreshing their data to agreed minimum frequencies | Within 21 months of contract award | T |
| G2 | Conduct user surveys to measure user satisfaction and NUAR uptake in operations. The desired survey outcomes must indicate that:* At least 80% of end users in the MVP Regions report platform is easy to use and intuitive
* At least 80% of excavators in the MVP Regions find the observations feedback loop user friendly and easy to use
* 90% of statutory undertakers in the MVP Regions are using the platform to plan and carry out excavations
* 90% of Asset Owners in the MVP Regions have implemented internal processes to respond to feedback made by excavators
 | Within 21 months of contract award | All work streams |
| G3 | Sufficient reporting is available to support the cost recovery regime | Within 21 months of contract award | CR |
| Gateway Review H – Within 24 months of contract award |
| H1 | System Architecture Design document - Major review and revision for national rollout | Within 24 months of contract award | D |
| H2 | Security Controls and Security Architecture Document - Major review and revision for national rollout | Within 24 months of contract award | D |
| H3 | Integration Design Document - Major review and revision for national rollout | Within 24 months of contract award | D |
| H4 | API Specification Documents - Major review and revision for national rollout | Within 24 months of contract award | D |
| H5 | Core Data Specification and Feature Catalogue - Major review and revision for national rollout | Within 24 months of contract award | D |
| H6 | Product backlog - Major review and revision for national rollout | Within 24 months of contract award | D |
| H7 | Materials for Data Model familiarisation sessions -Major review and revision for national rollout | Within 24 months of contract award | D |
| H8 | Data Design document: User Account and Security data - Major review and revision for national rollout | Within 24 months of contract award | D |
| H9 | Data Design document: other data structures - Major review and revision for national rollout | Within 24 months of contract award | D |
| H10 | Data Transformation and Ingestion Subsystem Architecture Design - Major review and revision for national rollout | Within 24 months of contract award | D |
| H11 | Security Controls document - Major review and revision for national rollout | Within 24 months of contract award | D |
|  |
| 10 | Conduct user surveys to measure user satisfaction and NUAR uptake in operations. The desired survey outcomes must indicate that:* 90% of planners in the MVP Regions report using NUAR as their first point of call when planning excavations
* 85% of Asset Owners surveyed in the MVP Regions report using NUAR in the field when carrying out excavations
* 85% of surveyed end users report high levels of satisfaction with the user experience (see guidance on measuring user satisfaction)
 | Within 27 months of contract award | All work streams |
| 11 | Exit strategy - Amendment for end of contract exit, including records as per 6.8.1 | Within 33 months of contract award | CR |
| Gateway Review I – Within 36 months of contract award |
| I1 | 99% of Asset Owners across the UK are refreshing their data to agreed minimum frequencies | Within 36 months of contract award | T |
| I2 | NUAR delivered, available for production use across the UK | Within 36 months of contract award | All work streams |

## All deliverables and milestones will need to be approved by the Customer.

## The Gateway Reviews will be conducted by the Customer’s Programme Board and will be signed-off by the Senior Responsible Officer.

## The Supplier will provide regular show and tell demonstrations of the platform for the Customer, Asset Owners and other interested parties where feedback will be elicited and acted upon.

## The only milestones that are attached to payments during the MVP Phase are those related to the Data Transformation and Ingestion workstream (marked with a 'T'). Further payment milestones for the Data Transformation and Ingestion workstream for the National Rollout will be will defined by the Supplier, with the Customer’s agreement, prior to the start of the National Rollout phase.

# MANAGEMENT INFORMATION/reporting

## The Supplier will report progress against each workstream to the Contract/Project Manager assigned by the Customer to that workstream. They will also report overall progress against the milestones and documented deliverables to the Customer’s Senior Programme Manager, who will be assigned overall responsibility for contract management.

## Incremental delivery (building blocks) - The Customer will group the services and activities to be carried out. These groupings will be commissioned by the NUAR Programme Board. The Supplier will then deliver each building block using the methodology appropriate to each workstream as agreed with the Customer. The Supplier will seek to deliver value at the earliest opportunity by taking an incremental approach to delivery. The Supplier will report progress to the Customer’s workstream leads and Senior Programme Manager as appropriate.

# volumes

## The list of Asset Owners understood to be active in England, Wales and Northern Ireland at the time of writing is given in Appendix A.

## The length of the underground network in kilometres in England, Wales and Northern Ireland and the percentage share of the total, broken down by asset sector was calculated by the Customer based on publicly available information and in consultation with Asset Owners. These are presented below and they are indicative:

|  |  |  |
| --- | --- | --- |
| **Asset Sector** | **Length of Underground Network (km)** | **% Share** |
| District Heating | 1,250 | 0 |
| Electricity | 412,000 | 12 |
| Gas | 245,000 | 7.1 |
| Water and Sewage | 637,000 | 18.6 |
| Telecoms | 629,000 | 18.3 |
| Transport | 42,000 | 1.2 |
| Small fiber optics | 31,000 | 1 |
| Highway cables | 718,000 | 20.9 |
| Highway drains | 718,000 | 20.9 |
| Other | 1,000 | 0 |
| **Grand Total** | **3,434,250** | **100.0** |

## The Customer calculated the estimated number of digs, by statutory undertakers per year in England, Wales and Northern Ireland, broken down by asset sector, using public sources and estimates by selected statutory undertakers. These are presented below and they are indicative:

|  |  |
| --- | --- |
| **Asset Sector** | **Estimated Number of Digs per year** |
| Electricity | 307,000 |
| Gas | 710,000 |
| Water and Sewage | 955,000 |
| Telecoms | 382,500 |
| Highways | 1,457,000 |
| Transport | 190,500 |
| **Grand Total** | **4,002,000** |

## NB each “dig” may incur a number of information requests (including: planning, site visits and execution)

# continuous improvement

## The Supplier will be expected to continually improve the way in which the required Services are to be delivered throughout the contract duration, including the approach to security in the platform and the delivery of the Requirement.

## The Supplier should present new ways of working to the Customer in regular retrospectives or contract review meetings.

## The Supplier will actively elicit, review and act upon feedback from stakeholders and End Users of the platform throughout the development process.

## Changes to the way in which the Services are to be delivered must be brought to the Customer’s attention and agreed prior to any changes being implemented.

# quality

## Accreditations

### The Supplier will deliver the NUAR platform and related transformation and ingestion activities in accordance with GDS Service Standards unless agreed otherwise by the Customer (<https://www.gov.uk/service-manual/service-standard>).

### The Supplier will carry out work in accordance with the UK Government Service Design Manual (<https://www.gov.uk/service-manual>), including the use of moderated usability testing (<https://www.gov.uk/service-manual/user-research/using-moderated-usability-testing>).

### The Supplier will follow Agile Delivery Principles in delivering the NUAR platform and related transformation and ingestion activities (<https://www.gov.uk/service-manual/agile-delivery>).

### The user interface design will conform to the WCAG 2.1 AA Accessibility Standards (<https://www.w3.org/TR/WCAG21/>) as defined in UK government guidance on accessibility  (<https://www.gov.uk/service-manual/helping-people-to-use-your-service/making-your-service-accessible-an-introduction#meeting-government-accessibility-requirements>).

### The Supplier will design the system to be fully compliant with The Privacy and Electronic Communications (EC Directive) Regulations 2003[[17]](#footnote-18).

### The Supplier will engage with government information assurance governance processes related to matters such as security architecture, information security risk assessments, etc.

## Quality Requirements/Standards

### The Supplier will be able to demonstrate robust, documented software QA processes, supported by suitable infrastructure environments (Development/QA/UAT/Staging/Production).

### All development and related deliverables will be subject to review and sign-off by the Customer appointed Product Owner according to Acceptance Criteria defined and agreed during Sprint planning.

### The Supplier, together with the Customer, will undergo regular Service Assessments by Government Digital Service and/or the Cabinet Office’s CDIO Directorate (<https://www.gov.uk/service-manual/service-assessments/how-service-assessments-work>).

# PRICE

## Prices are to be submitted via the e-Sourcing Suite Attachment 4 – Price Schedule excluding VAT and including all other expenses relating to Contract delivery.

# STAFF AND CUSTOMER SERVICE

## The Supplier will provide a sufficient level of resource throughout the duration of the Contract, in order to deliver consistently a quality service, as defined by the deliverables and the Acceptance Criteria.

## The Supplier’s staff assigned to the Contract will have the relevant qualifications and experience to deliver the Contract to the required standard.

## The Supplier will ensure that staff understand the Customer’s vision and objectives and will provide excellent customer service to the Customer throughout the duration of the Contract.

## The Supplier will note that the workstreams will require different skill and experience level and resource needs may change as the programme progresses. The Supplier will make resources available accordingly.

## The Supplier staff will:

### Fulfil all reasonable requests of the Customer;

### Apply all due skill, care and diligence to the provisions of the Requirement;

### Be appropriately experienced, qualified and trained to supply the Requirement;

### Respond to any enquiries about the Requirement as soon as reasonably possible;

### Complete any necessary vetting procedures specified by the Customer; and

### Comply with the provisions of the Official Secrets Act 1911 to 1989 and Section 182 of the Finance Act 1989

## Technical roles fulfilled by the Supplier are expected to include, but are not limited to:

### Technical Architect

### Data Architect

### Data Modeller

### Data Transformation Specialist

### Business Analyst

### Project Manager

### Security Specialist

### User Research Engineer

### UX/UI Designer

### Software Development Lead

### Software Engineer (front end)

### Software Engineer (back end/full stack)

### Testing Engineer

## The Supplier will ensure that multiple resources for each role are fulfilled as required at different stages of the project, and different levels of seniority (Junior/Senior/Lead etc.) are assigned for each role. All staff should have appropriate qualifications and experience for the role and level of seniority to which they are assigned.

## The Supplier will work as an integral part of the ‘One Team’ delivery unit as set out in Contract Management, Section 17. The Customer will appoint a skilled member of staff to lead each workstream, who will be responsible for:

### Providing overall strategic direction;

### Agreeing the delivery approach for the assigned workstream;

### Agreeing the timeline of activity;

### Agreeing any external communications;

### Acting as first point of contact for escalation;

### Ensuring effective communication and working between the Supplier, Local Government representatives and other subject matter experts.

## The Customer may also assign a contract manager to each workstream, who will monitor the Supplier’s progress against the agreed outcomes, timeline and costs. This officer will act as the first point of contact for contractual matters.

# service levels and performance

## The Customer will measure the quality of the Supplier’s delivery as described in Key Milestones and Deliverables, Section 7.

## The Supplier will produce an exit strategy for sign off by the Customer as described in Key Milestones and Deliverables, Section 7. The exit strategy will include the Supplier’s obligations in relation to:

### Information to be made available to inform a future tender;

### Knowledge transfer;

### Data transformation (including transformation of relevant project data, such as the product backlog, knowledge hub, etc);

### Follow-up support;

### Information relevant to cost recovery structures;

### Evidence of data deletion on expiration date of this contract;

### Evidence of the Supplier’s users access removal on expiration date of this contract;

### Complete handover of the outcomes and outputs under this contract; and

### Any consideration for TUPE arrangements, if required.

# Security and CONFIDENTIALITY requirements

## Personnel Security Requirements – The Supplier will:

### Ensure that all staff involved in the technical development and ongoing running or maintenance of the NUAR platform have at a minimum CTC (Counter Terrorism Check) clearance, including but not limited to Developers, Quality Assurance personnel, Database Administrators, Architects, Project Management, Support personnel. Any staff not already cleared at the time of contract award must start the process of gaining clearance within 4 weeks of contract award. The Supplier will ensure that data is not shared with staff that are not vetted.

### Ensure that all staff involved in the non-platform related delivery of the NUAR programme (Asset Owner Engagement etc) have as a minimum BPSS (Baseline Personnel Security Standard) clearance. Any staff not already cleared at the time of contract award must start the process of gaining clearance within 4 weeks of contract award.

### Ensure that the Supplier provides access to certain privileged roles within the platform, as defined by the Customer, only to End Users with the required security level,also as defined by the Customer. The Supplier will implement proportional privileged access management processes to ensure that privileged access is secure, audited and role- and time-limited.

### Consult with the UK Government approach to background checks and security vetting[[18]](#footnote-19), and CPNI’s guidance on employment screening[[19]](#footnote-20).

### Develop a security awareness package to be used in the engagement with all Supplier personnel on this contract and made available for use by NUAR End Users. The security awareness package will explain the need to protect NUAR data and highlight good security practices in respect of the use of the system.

### Ensure that the Supplier, and any subcontractors with access to the Customer’s and Asset Owners’ data, hold and maintain ISO 27001:2013 and Cyber Essentials plus certification for the duration of the contract.

### Employ a CHECK approved provider at the Supplier’s cost and expense at least annually, or when significant changes are made to the solution (e.g. significant architectural changes, changes to the threat landscape), to undertake full penetration testing of the solution, and security architecture review, with the scope of the testing agreed in advance by the Customer.

### Ensure that data storage and access will be from the UK only.

### Ensure the certified, secure destruction of all NUAR data from all systems of the Supplier and their supply chain within a reasonable time following termination of the contract.

## System Security Requirements

### The Supplier will conduct a security risk assessment to identify all potential threats to NUAR and effective countermeasures, in addition to demonstrating a clear understanding of the difference between commercial security concerns and other security concerns and how each will be managed by the Supplier. The Supplier will produce a security controls document using Appendix N as reference.

### Concerning data, access, management, maintenance and development of the system, the Supplier will:

#### Ensure that data confidentiality is maintained, in addition to the integrity of that data, including any data that is temporarily stored, whilst ensuring personally identifiable data will be protected, in line with GDPR, from unauthorised use.

#### Ensure that minimum availability requirements are achieved, as specified in the non-functional requirements listed in Appendix H.

#### Ensure all environments that contain data are as secure as the production system, including environments where data transformation occurs, and explain how any unexpected loss of data can be mitigated to ensure restoration of the live service is prompt.

#### Define how access to data in the system will be logged, monitored and reported, with centralisation of logs to allow more proficient monitoring.

#### Ensure that robust data validation and security controls are applied to data entering the system from Asset Owners and from End Users, in line with NCSC guidance on safely importing data[[20]](#footnote-21).

#### Ensure that appropriate levels of access are only granted to authorised people, within authorised organisations, in line with the principle of least privilege and that robust controls prevent those not entitled to access from accessing the system[[21]](#footnote-22). This must include measures for the detection and prevention of End Users abusing the system, and proportional privileged access management processes.

#### Ensure that all user access and activity is stored in a detailed audit record with an agreed period of data retention, and accessible to analytical tools to allow the monitoring of system use at the user and organisation levels.

#### Ensure continuity of secure access in the event of service provider failure (cloud host, telecommunications etc). A robust audit process must be defined and implemented.

#### Ensure system components will be maintained and protected indefinitely, in addition to the system's ability to cope with a wide range of issues e.g. graceful degradation in the face of DDoS attack in line with NCSC guidance on denial of service[[22]](#footnote-23) and protection against attacks in line with NCSC guidance on malware and ransomware[[23]](#footnote-24).

#### Ensure suitable segregation of system components and tiers, such that a compromise to one element of the system can be contained, with no opportunities to compromise other, more sensitive elements of the system.

#### Ensure NUAR will be developed in a secure environment and incorporates a security minded approach in line with NCSC guidance on secure by default[[24]](#footnote-25), as a priority, throughout every iteration of development.

#### Ensure that the application, its data, and all related processing and storage shall be hosted in a secure UK data centre that complies with good practice guidance available from NCSC and CPNI regarding physical, personnel and cyber security. The selection of suitable data centres will be subject to review by the Customer.

#### Be required to undertake an Information Security Risk Assessment of the proposed solution to include all components of the system where the Asset Owners’ data will be stored and processed. The risk assessment and associated control measures will be documented in a Security Management Plan, which is approved by the Customer. The Security Management Plan will be updated on an annual basis or when significant changes to the system are planned or implemented.

### The security controls employed will be required as a minimum to include those listed in Appendix N – Security Controls.

### The Supplier will be required to accept the revised security schedule (Call Off Schedule 7), which shall be incorporated into the Call Off Terms and substitute the standard Management Consultancy Framework 2 Call Off Terms schedule 7 in its entirety.

# payment AND INVOICING

## Payment can only be made following satisfactory delivery of pre-agreed certified products and deliverables.

## Before payment can be considered, each invoice must include a detailed elemental breakdown of work completed and the associated costs.

## Invoices should be submitted to the Customer’s Programme Manager and to: REDACTED TEXT.

# CONTRACT MANAGEMENT

## The Customer will assign contract managers as appropriate to monitor the contract entered into with the Supplier. The Supplier will produce a list of key dependencies, assumptions and obligations, which will be agreed with the Customer shortly after contract award. The Supplier will also produce and maintain the following documents to be reviewed in a monthly contract review meeting with the Customer:

### Risk register, including mitigation;

### Finance monitoring sheet (showing both actuals and forecasted spend);

### Timeline of works, setting out progress against key timelines;

### Performance reporting of the system;

### Vendor lock-in.

## The Customer and the Supplier will agree on appropriate contract resolution processes prior to entering into contract. The Customer’s and the Supplier’s Contract Relationship Managers will be the first point of resolution before any escalation steps are taken, and they will aim to resolve differences before they become issues. The Contract Relationship Managers will meet on a weekly basis.

## The Supplier will also provide a monthly update on progress before the NUAR Programme Board.

## Delivery Unit - The Customer intends to utilise existing relationships, including those with subject matter experts, Local Government organisations and Asset Owners to deliver the NUAR Programme. The Customer also seeks to avoid common pitfalls to effective delivery such as:

### Under-utilising existing resources or relationships;

### Siloed / disjointed working within and across workstreams;

### Lack of strategic direction;

### Lack of clear escalation process;

### Unclear links to, and monitoring of, outcomes.

## To achieve the above aims, the Customer will establish a ‘One Team’ delivery unit within the Geospatial Commission. The structure and composition of this team will consist of a combination of GC staff, Local Government leads, subject matter experts and staff provided by the Supplier. The purpose of the ‘one team’ structure is to ensure:

### Strong strategic leadership and direction at the right level for each stream of work;

### Sufficient access to subject matter expertise / institutional and acquired knowledge;

### Continuity of relationships (across the sector and within government);

### Robust contract management and assurance;

### Clear escalation process / decision making function by the Customer.

## The Supplier will note that the one team is a support structure and does not absolve the Supplier of its obligations under this requirement.

## The Supplier will act as an integral part of the ‘One Team’ structure and will provide staff as required to support each workstream, as set out in this Requirement. Work will not be carried out in silos, including activities associated with development and project planning.

## The ‘One Team’ is illustrated below, though its composition is subject to change:

##

# Location

## The Supplier will make staff available for regular face-to-face meetings (including workshops, sprint planning sessions, retrospectives and stakeholder events) and joint working, including at the Customer’s premise (10 South Colonnade, Canary Wharf, London, E14 4PU) – as permitted by Government guidance related to the pandemic. Co-locating is recommended subject to government advice on social distancing restrictions.

## As required, the Supplier will also operate across the UK, starting with the three MVP regions in the North East of England, London and Wales.

# appendices

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| --- | --- |
| **Appendix A** | **List of Asset Owners** |
| **Appendix B** | **Data Exploration Agreements** |
| **Appendix C** | **End User Terms** |
| **Appendix D** | **Business-As-Usual Processes (Maps and report)** |
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| **Appendix G** | **Product Backlog/User Stories** |
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| **Appendix K** | **Data Model Description** |
| **Appendix L** | **Data Model Backlog** |
| **Appendix M** | **Data Specification Outline** |
| **Appendix N** | **Security Controls** |

1. Cabinet Office. 2018. An Initial Analysis of the Potential Geospatial Economic Opportunity. Available online. [↑](#footnote-ref-2)
2. Cabinet Office. 2019. Call for Evidence - Submitted Responses. Available online. [↑](#footnote-ref-3)
3. Likhari, Rimaljit et al. 2017 Mapping underground assets in the UK: Project Iceberg. Work Package 1, market research into current state of play and global case studies. British Geological Survey, 72pp. (OR/17/052) [↑](#footnote-ref-4)
4. Cabinet Office, 2020. Unlocking the power of location: The UK’s geospatial strategy. Available online. [↑](#footnote-ref-5)
5. HM Treasury, 2020. National Infrastructure Strategy. Available online [↑](#footnote-ref-6)
6. The Customer will source base map data [↑](#footnote-ref-7)
7. Scotland is currently using the VAULT system so it is out of scope for this requirement [↑](#footnote-ref-8)
8. <https://geoportal.statistics.gov.uk/datasets/nuts-level-1-january-2018-names-and-codes-in-the-united-kingdom/data> [↑](#footnote-ref-9)
9. <https://www.ncsc.gov.uk/collection/saas-security/saas-security-principles> [↑](#footnote-ref-10)
10. <http://portal.opengeospatial.org/files/?artifact_id=39967> [↑](#footnote-ref-11)
11. <http://portal.opengeospatial.org/files/?artifact_id=14416> [↑](#footnote-ref-12)
12. <http://portal.opengeospatial.org/files/?artifact_id=35326> [↑](#footnote-ref-13)
13. <http://docs.opengeospatial.org/is/17-069r3/17-069r3.html> [↑](#footnote-ref-14)
14. <https://www.gov.uk/guidance/gds-api-technical-and-data-standards> [↑](#footnote-ref-15)
15. <https://docs.ogc.org/per/17-090r1.html> [↑](#footnote-ref-16)
16. <https://www.gov.uk/service-manual/technology/designing-for-different-browsers-and-devices> [↑](#footnote-ref-17)
17. <https://www.legislation.gov.uk/uksi/2003/2426> [↑](#footnote-ref-18)
18. <https://www.gov.uk/government/publications/united-kingdom-security-vetting-clearance-levels> [↑](#footnote-ref-19)
19. <https://www.cpni.gov.uk/employment-screening> [↑](#footnote-ref-20)
20. <https://www.ncsc.gov.uk/guidance/pattern-safely-importing-data> [↑](#footnote-ref-21)
21. <https://www.ncsc.gov.uk/collection/secure-system-administration/risk-manage-administration-using-tiers> [↑](#footnote-ref-22)
22. <https://www.ncsc.gov.uk/collection/denial-service-dos-guidance-collection/preparing-denial-service-dos-attacks1> [↑](#footnote-ref-23)
23. <https://www.ncsc.gov.uk/guidance/mitigating-malware-and-ransomware-attacks> [↑](#footnote-ref-24)
24. <https://www.ncsc.gov.uk/information/secure-default> [↑](#footnote-ref-25)