Notes on Completion: Please refer to the appropriate NIA Governance Document to assist in the completion of this form. The full completed submission should not exceed 6 pages in total.

# NIA Project Registration and PEA Document

### Date of Submission

Mar 2019

### Project Reference Number

NIA_NGN_246

## Project Registration

### Project Title

Smart SLG Phase 2

### Project Reference Number

NIA_NGN_246

### Project Licensee(s)

Northern Gas Networks

### Project Start

March 2019

### Project Duration

0 years and 9 months

### Nominated Project Contact(s)

Richard Hynes-Cooper

### Project Budget

£462,116.00

### Summary

The project will progress the PoC Demonstrator developed in NIA_NGN_223 and release it into 1Spatial's Functional Test Environment at TRL8 (with some capabilities up to TRL6). As such, the project will have progressed phase 1 PoC functionality to be in the form of an actual application/system that has been completed, functionally tested, and is "commercially ready" for the networks to deploy

### Third Party Collaborators

1Spatial

### Nominated Contact Email Address(es)

innovation@northerngas.co.uk

### Problem Being Solved

For locations of high impact where traffic management is required, a Traffic Management Plan must be submitted for approval to the local highway authority and relevant stakeholders. This is typically produced in the form of a CAD drawing provided by specialist third parties.

TM Plans must be compliant with the Code of Practice and the Traffic Signs Manual Chapter 8. Producing TM Plans takes time, can involve multiple iterations, communications, and site visits, and involves specialist service providers.

A Smart Signing, Lighting and Guarding Stage 1: Automated Plans project was undertaken by NGN as the result of a call for innovation via the Energy Innovation Centre, seeking to address the significant problem associated with accurate, compliant, and high-quality traffic management planning. The key question driving the innovation was whether there is a better way of producing at least some TM Plans more efficiently, with a lower cost.

The key output of the Stage 1 project was a proof of concept (PoC) Demonstrator application that automated Traffic Management Plan production. This PoC Demonstrator proved that it is possible to automate the production of Traffic Management Plans using at least

some of the rules identified.

## Method(s)

The focus of this proposal is to take the PoC Demonstrator application and progress it towards a version of the application that fulfils TRL8 criteria. In addition, it will also contain some functional capabilities up to TRL6, these capabilities include the addition for traffic flow data.

*Project Specific Information*
The first phase of this project has been completed successfully and has received positive feedback from both internal and external stakeholders. Leeds City Council have been a key stakeholder throughout phase 1 and remain committed to supporting this work with a view that this solution may have significant potential to revolutionise the way that StreetWorks are assessed and planned.

This project includes what is required for further development to meet stakeholder needs, specifically around traffic sensitivity and customer impacts. The project will be delivered in two workstreams relevant to an end TRL:

**Up to TRL8 – development of PoC to a production ready environment**

The purpose of this stream is to enable the production-ready delivery of items demonstrated during ***NIA_NGN_223.***

**Up to TRL6 – development of PoC to include additional data sets**

Work for TRL6 and the below requirements will involve timeboxed sprints of two-week durations to allow the team to investigate the approach to providing the requirements in a proof of concept (non-production) environment.

The two phased approach to this project offers multiple potential benefits, 'unlocking' capability to deliver near term benefits and further explore the potential for future data driven design.

## Scope

This project will produce an application that is complete at TRL8, as follows:

The functional capabilities addressed by this project will

- be "commercially ready";
- have been tested in an operational environment;
- have been demonstrated in an operational environment;
- be fully integrated with operational hardware and software in an environment that is a Functional Test Environment provisioned by 1Spatial and accessible for purposes of Functional Acceptance Testing and stakeholder demonstration by NGN;
- User documentation, training documentation, and maintenance documentation will be limited, but complete in so far as these are relevant to the scope described in this proposal and to the Functional Test Environment;
- NGN will be able to, and indeed is responsible for, Functional Acceptance Testing (FAT) in the 1Spatial-provisioned Functional Test Environment;
- Functional Acceptance Testing by NGN will verify and validate the functional scope described in this proposal.

For requirements identified for release at up to TRL6, this project will produce an application that is complete with respect to the scope described in this proposal at up to TRL6, which may include the following:

- Feasibility assessments;
- Prototyping of capabilities;
- Engineering feasibility fully demonstrated in actual system application.

**Reason for extending the project**
Functional testing has been undertaken to access the functionality of the Smart SLG Solution against the project objectives. The testing resulted in a number of 'defects' within the application rules.

In order to progress the project further the 'defects' within the application need to be resolved in order to fulfil the scope of the project.

1spatial have agreed to investigate and resolve the defects within the Smart SLG application at no additional cost, however a project

timeline extension is required to undertake this work.

After the defects have been resolved and re tested, the project will be deemed a success and be complete.

## Objective(s)

The project will progress the PoC Demonstrator developed in ***NIA_NGN_223*** and release it into 1Spatial's Functional Test Environment at **TRL8** (with some capabilities up to **TRL6**). As such, the project will have progressed phase 1 PoC functionality to be in the form of an actual application/system that has been completed, functionally tested, and is "commercially ready" for the networks to deploy

The following "scenarios" are the TM scenarios that have already been identified as priority by NGN and key stakeholders through earlier design sprint sessions. These are deemed to unlock the greatest potential value from the Poc demonstrator, so are to be considered for this project:

- Basic layout with a works vehicle
- Works entirely on the footway
- Works on footway with pedestrian diversion into carriageway
- Dual carriageway with a speed limit of 40 mph, works in right lane
- Dual carriageway with a speed limit of 40 mph, works in left lane
- Works in a side road at a T-junction
- Traffic control by 'give and take' for roads with a speed limit of 30 mph or less
- Traffic control by portable traffic signals
- Traffic Control - Unobstructed widths

The project will also produce an application that is complete with respect to the scope described in this proposal at up to **TRL6** that can demonstrate feasibility and additional prototype capabilities as defined in the project scope.

## Consumer Vulnerability Impact Assessment (RIIO-2 Projects Only)

n/a

## Success Criteria

This project will be deemed a success if it offers a definitive outcome relating to either,

A Smart Signage, Lighting & Guarding Application that is complete with respect to the scope described in this proposal at TRL8, as follows:

a. The functional capabilities addressed by this project will be "commercially ready";

b. The functional capabilities addressed by this project will have been tested in an operational environment, specifically a Functional Test Environment provisioned by 1Spatial and accessible for purposes of Functional Acceptance Testing and stakeholder demonstration by NGN.

Functional Test strategy/specification/plan that is specific and relevant to the scope of the project and to the Functional Test Environment for delivery of a TRL8 solution.

User documentation in the form of a basic user guide/training guide. Documentation will be limited, but complete in relation to the project described in this proposal for TRL8 requirements, and to reflect delivery of the solution in the 1Spatial-provisioned Functional Test Environment.

## Project Partners and External Funding

1Spatial

## Potential for New Learning

The project is, by its very nature highly innovative and open (Agile) until towards its completion. This provides the clear basis of a specific technology development plan to deliver near term efficiencies and associated benefits whilst also highlighting future opportunities for further development using geospatial technology.
This project is designed to take this concept to an operational delivery level to enable efficiencies and for use in demonstrations with key stakeholders.

## Scale of Project

The purpose of this stream is to enable the production-ready delivery of items demonstrated during the Proof of Concept phase. To achieve the intended project outcome and unlock 'new' learning it is necessary to 'scale' the project as detailed within the scope section of this document. If the scope was reduced, it would not be possible to learn the effectiveness and the value of the outlined solution.

## Technology Readiness at Start

TRL4 Bench Scale Research

## Technology Readiness at End

TRL8 Active Commissioning

## Geographical Area

NGN area – Development environment in Leeds.

## Revenue Allowed for the RIIO Settlement

N/A

## Indicative Total NIA Project Expenditure

External costs – £415,000
Internal costs – £47,116
Sanctioning costs - £462,116

# Project Eligibility Assessment Part 1

There are slightly differing requirements for RIIO-1 and RIIO-2 NIA projects. This is noted in each case, with the requirement numbers listed for both where they differ (shown as RIIO-2 / RIIO-1).

## Requirement 1

Facilitate the energy system transition and/or benefit consumers in vulnerable situations (Please complete sections 3.1.1 and 3.1.2 for RIIO-2 projects only)

Please answer **at least one** of the following:

## How the Project has the potential to facilitate the energy system transition:

n/a

## How the Project has potential to benefit consumer in vulnerable situations:

n/a

## Requirement 2 / 2b

Has the potential to deliver net benefits to consumers

Project must have the potential to deliver a Solution that delivers a net benefit to consumers of the Gas Transporter and/or Electricity Transmission or Electricity Distribution licensee, as the context requires. This could include delivering a Solution at a lower cost than the most efficient Method currently in use on the GB Gas Transportation System, the Gas Transporter's and/or Electricity Transmission or Electricity Distribution licensee's network, or wider benefits, such as social or environmental.

## Please provide an estimate of the saving if the Problem is solved (RIIO-1 projects only)

This project has the potential for network Licensee's to undertake street works impact assessments to identify in seconds at the click of a button and produce automated traffic management plans and understand customer impact zones via an automated function to deliver a more efficient and high-quality service.
This will assist network designers, planners and operational engineers to complete work with greater efficiency via an in-house provision without the need for engaging a 'costly' specialist service

## Please provide a calculation of the expected benefits the Solution

The project is forecasted to deliver benefit in the following areas:

1. Fewer visits to site, meaning lower costs and vehicle emissions;
2. Increased and more efficient local authority engagement;
3. More effective planning;
4. More effective design via iterative review of proposed TM Plans that will also lead to plans with lower reinstatement costs;
5. A rules engine that could suggest optimum diversion routes;
6. Inventory for SLG requirements available for assessment during planning and when at site;
7. Linking SLG to customer address database to produce letters providing notice of planned works
8. More consistency in production of TM plans;
9. The ability to produce plans without the need for a specialist 3rd party service.

Forecasted expected benefits per annum is £101,875

## Please provide an estimate of how replicable the Method is across GB

This approach is relevant to all network licensees and can be applied to all works where Streetworks are required.

## Please provide an outline of the costs of rolling out the Method across GB.

The costs for commercially ready solution are not yet understood and will be defined as part of the project.

## Requirement 3 / 1

Involve Research, Development or Demonstration

A RIIO-1 NIA Project must have the potential to have a Direct Impact on a Network Licensee's network or the operations of the System

Operator and involve the Research, Development, or Demonstration of at least one of the following (please tick which applies):

☑ A specific piece of new (i.e. unproven in GB, or where a method has been trialled outside GB the Network Licensee must justify repeating it as part of a project) equipment (including control and communications system software).

☐ A specific novel arrangement or application of existing licensee equipment (including control and/or communications systems and/or software)

☐ A specific novel operational practice directly related to the operation of the Network Licensees system

☐ A specific novel commercial arrangement

RIIO-2 Projects

☐ A specific piece of new equipment (including monitoring, control and communications systems and software)

☐ A specific piece of new technology (including analysis and modelling systems or software), in relation to which the Method is unproven

☐ A new methodology (including the identification of specific new procedures or techniques used to identify, select, process, and analyse information)

☐ A specific novel arrangement or application of existing gas transportation, electricity transmission or electricity distribution equipment, technology or methodology

☐ A specific novel operational practice directly related to the operation of the GB Gas Transportation System, electricity transmission or electricity distribution

☐ A specific novel commercial arrangement

### Specific Requirements 4 / 2a

### Please explain how the learning that will be generated could be used by the relevant Network Licensees

Customer impact assessments and traffic management plans are an essential requirement in many network repair and replacement activities for all network licensees. The project will develop methods of speeding up and reducing the cost and impact of Streetworks planning and identify opportunities where networks can automate operational site planning. The methods will either be directly applicable to other networks or readily adaptable to them.

### Or, please describe what specific challenge identified in the Network Licensee's innovation strategy that is being addressed by the project (RIIO-1 only)

'Customer' is a key area of the innovation strategy that is being targeted. Predominantly to look to improve operational efficiency, stakeholder engagement and enable reduced impact and disruption to customers via exploitation of computer-based technology without detrimental impact on safety.

☑ Has the Potential to Develop Learning That Can be Applied by all Relevant Network Licensees

### Is the default IPR position being applied?

☑ Yes

## Project Eligibility Assessment Part 2

### Not lead to unnecessary duplication

A Project must not lead to unnecessary duplication of any other Project, including but not limited to IFI, LCNF, NIA, NIC or SIF projects already registered, being carried out or completed.

### Please demonstrate below that no unnecessary duplication will occur as a result of the Project.

We have conducted research and are confident an equivalent solution is not available on the market or in currently owned software solutions.
No similar projects are being carried out by other Network Licensees.

### If applicable, justify why you are undertaking a Project similar to those being carried out by any other Network Licensees.

n/a

## Additional Governance And Document Upload

## Please identify why the project is innovative and has not been tried before

The approach towards the management of StreetWorks activity on site has remained the same for a significant number of years. This project is further enhancing development of software to assist in rules driven digital decision making that has been proven at small scale but for deployment in a production environment at scale remains unproven.

## Relevant Foreground IPR

n/a

## Data Access Details

n/a

## Please identify why the Network Licensees will not fund the project as apart of it's business and usual activities

NGN recognise the need to build upon and improve current operational practices. However, this project remains low to medium starting TRL and the outcomes remain uncertain. Clarity is needed from this project to evaluate future potential.

## Please identify why the project can only be undertaken with the support of the NIA, including reference to the specific risks(e.g. commercial, technical, operational or regulatory) associated with the project

This project is highly innovative and involves significant digital development work to construct a robust and consistent rules engine to automate what is currently a manual process. The risk associated with this investment is greater than would be acceptable through our business as usual funding. It represents a novel use of software technology not previously used in the industry or globally

## This project has been approved by a senior member of staff

☑ Yes