BIS | Department for Business Innovation & Skills

BROADBAND DELIVERY UK
USC THEORETICAL EXERCISE

Request for Information

15 JULY 2010

Contents

1 Purpose and structure of this document

This document is the Request for Information for the Broadband Delivery UK (BDUK) USC Theoretical Exercise, which provides information about the exercise, including information about the areas selected for the exercise, and the specific questions to be provided in a response.

BDUK is using the USC Theoretical Exercise to understand both the *cost effectiveness* of different standard and super-fast broadband solutions to achieve universal broadband service coverage (the USC), and also the *capacity and willingness* of broadband suppliers to increasing broadband availability in the UK to areas that are economically more challenging to serve.

This information will be used by BDUK in determining which commercial model is most likely to be successful in achieving its objectives, before designing and running a competitive process for deploying Government funds in accordance with that model.

Broadband suppliers are encouraged to participate in this exercise, to take the opportunity to illustrate their capability and capacity to achieve the USC, and thereby influence BDUK's choice of commercial delivery model.

Section 2 of this document sets out BDUK's objectives and overall approach, and provides context for the USC Theoretical Exercise.

Section 3 of this document sets out the specific objectives of the USC Theoretical Exercise, and explains how the information provided by suppliers will achieve these objectives.

Section 4 of this document provides an overview description of the process for the USC Theoretical Exercises.

Section 5 of this document provides information on the logistics of the exercise, including timescales and routes for finding more information before submitting responses.

Section 6 of this document introduces the specific real-world areas that have been picked for the USC Theoretical Exercise.

Section 7 of this document sets out the specific questions that suppliers are asked to respond to.

Section 9 of this document provides more information on how the information will be used by BDUK once submitted.

2 Background to Broadband Delivery UK

2.1 Context

There is widespread consensus on the crucial impact on, and benefits to, economies and societies of ubiquitous broadband connectivity. Universal availability of a minimum standard of connectivity is required to support business growth, enable key public services to be delivered online and permit a quality home working experience from anywhere in the UK. The delivery of high speed connectivity to every rural village and town is required to keep the UK's economy competitive.

The topography and/or demographic characteristics of certain geographies will require significant investment to deploy broadband infrastructure and this, together with the lack of competitive pressure in certain geographical areas, means that market-driven private investments alone will not achieve ubiquitous connectivity.

Against this backdrop, the UK Government has confirmed two key broadband objectives. Firstly, that virtually every community in the UK will have access to basic broadband connectivity with a minimum access speed of 2Mbps being implemented by 2012 (commonly known as the "Universal Service Commitment" or "USC"). Secondly, that it is committed to the roll-out of "superfast" broadband in remote areas of the UK at the same time as more densely populated urban areas, and that it would introduce measures to make this happen in areas where the commercial sector does not have sufficient commercial incentive to invest.

It is a Government's objective to use superfast broadband technologies to solve the USC problem wherever practical, cost effective and affordable. Where non-superfast broadband solutions are necessary, Government seeks to promote technologies with an upgrade path to superfast broadband to minimise wasted investment.

2.2 USC Objective

The USC objective is to provide 2Mbps connectivity, which assumes a volume and quality of data throughput needed to support a quality home working experience, to all households and businesses that want it.

Under the USC, households and businesses should be able to receive standard definition video streams, conduct effective home working (including acceptable video-conferencing), and be able to access Government services online. There are several different technologies capable of delivering this, including both standard and superfast broadband solutions.

A significant proportion of households and businesses that do not currently have access to 2Mbps connectivity (the USC 'not-spots' and 'slow-spots') suffer from poor connectivity as a result of isolated poor home-wiring or other engineering problems and can be fixed through self-help or engineer visits. However, the majority of USC not-spot and slow-spot households and businesses are situated too far from their BT exchange (or alternative

network providers), such that additional remedies are required to provide a suitable solution.

USC not-spots and slow-spots are distributed throughout the UK: in urban, suburban, rural and remote areas, with vastly differing availability of telecoms infrastructure in these locations.

In addition to the access infrastructure, the provision of sufficient quality data transport (backhaul) and a useful and affordable product from an Internet Service Provider is required to ensure the USC objective is met at a not-spot or slow-spot location.

Therefore cost-effective solutions to the USC are likely to require a mix of different access and backhaul technologies and ISP services, and may also include re-use of existing resources. Due to the different economics of provision and variation in market capability and capacity in different areas, the optimal mix of technologies and solution for the USC in a given geographical area may vary significantly across the country.

2.3 Superfast broadband objective

Currently BDUK considers 'superfast' broadband simply as access to connectivity where the 'potential' throughput is more than 20Mbps with an unspecified upper limit. In practical terms, the objective is to increase penetration of high-capacity broadband infrastructure in the UK, to ensure the vast majority of customers have access to connectivity which supports these throughput speeds at affordable rates. Superfast broadband embraces a range of connectivity options, both fixed and radio-based technologies, for instance fibre-to-the-cabinet (FTTC), fibre-to-the-home (FTTH) or fibre/coax, as well as all 4G mobile and potentially satellite technologies.

BDUK envisages that in certain types of area, superfast broadband will be practical and cost-effective to deploy as part of the solution for providing USC to a subset of households and businesses in that area. This is aligned to Government policy to maximise the deployment of future-proof superfast broadband infrastructure rather than standard broadband infrastructure without an upgrade path as part of this 'once-in-a-generation' opportunity.

A key outcome for the USC Theoretical Exercise is for BDUK to understand better when the case can be made for deployment of superfast broadband infrastructure into an area, rather than the current generation of broadband infrastructure.

2.4 BDUK's key short-term activities

To help test current thinking and assumptions, and to shape and inform its strategies and commercial model for USC and superfast broadband, BDUK is currently focusing on three key activities:

2.4.1 USC Theoretical Exercise

BDUK is conducting this USC Theoretical Exercise to understand different solutions (which incorporate a mix of technologies and a mix of incumbent, new and public sector networks)

to the USC problem and opportunities to maximise superfast broadband connectivity in different geographies.

The USC Theoretical Exercise is being launched at the BDUK Industry Day on 15 July 2010 and suppliers have been invited to participate in this voluntary, hypothetical paper-based exercise to propose cost effective and commercially sustainable USC and superfast broadband solutions in three 'real world' examples. Any interested supplier with delivery capability, whether they attended the Industry Day or not, are invited to participate.

BDUK is seeking complete and integrated responses which will require collaboration and partnering between multiple technology suppliers to demonstrate that together they that could deliver commercial ISP services to all households and businesses in the chosen geographies.

This exercise provides suppliers the opportunity to declare their interest in terms of capability and geography in solving the USC, which will help inform BDUK's choice of commercial delivery model.

2.4.2 Superfast broadband market testing projects

BDUK will be competing and delivering three market testing projects to deploy high speed connectivity at affordable rates in rural and hard-to reach areas where the market is unlikely to serve. These projects will, amongst other things, help understand more specifically the economic, practical and regulatory challenges and constraints issues of deploying superfast broadband.

Further work will take place to scope specific requirements and determine the location and detailed approach for selecting solutions and delivering these pilot projects. Information gleaned from the USC Theoretical Exercise submissions will assist in scoping requirements for these projects.

Through implementing the market testing projects, BDUK intends to collect detailed data (both practical and commercial) on the challenges of delivering superfast broadband to all remote areas in the UK.

2.4.3 Initial regional programme approach

BDUK is investigating a regional approach to superfast broadband, where public sector intervention in projects is planned, controlled and rolled-out at a regional level. BDUK proposes to develop and follow an initial regional programme approach to help inform a replicable regional approach for the implementation of superfast broadband in other regions across the UK.

3 Objectives of the USC Theoretical Exercise

BDUK is conducting this USC Theoretical Exercise to understand different solutions (which incorporate a mix of technologies and a mix of incumbent, new and public sector networks) to the USC problem and opportunities to maximise superfast broadband connectivity in different geographies.

The USC Theoretical Exercise presents suppliers with three real-world areas in different geographies where the market has left a significant proportion of households and businesses unable to access at least 2Mbps broadband.

Suppliers are asked to complete this hypothetical exercise, to:

- identify what solutions could be delivered in each of the selected areas to provide connectivity to support access to online Government a quality home-working experience to all households and business locations, using superfast broadband where cost effective; and
- provide an indication of the capex subsidy that would need to be provided by UK Government to make such a project a commercially sustainable proposition and support typical levels of take-up (i.e. at least 70%) of service.

3.1 Information sought through supplier responses

From the different supplier responses to this RFI document, BDUK expects to be able to compare a range of options for cost effective and complete solutions to understand how the USC could be achieved in the selected areas. The various responses are likely to include different technology mixes, and have differing impacts on broadband speeds for households and businesses in the area. The various responses are likely to include a range of values for filling the investment gap, and may identify existing gaps in the end-to-end supply chain (e.g. sales channels) that currently prevent the market from delivering this solution.

The choice of solution is likely to vary with a number of geography-specific factors, for example population density, topography, etc. By using the responses to understand how the choice of solutions change due to these geographical features, BDUK intends to extrapolate assumptions to a national level. BDUK will estimate the likely mix of solutions, technology, channel, and incentives required to meet the USC and estimate the aggregate investment gap to be met by Government in order for the market to deliver the USC, required to inform the business case for deploying USC funds.

It is important BDUK understands each respondent's ability to deliver, both locally and nationally, and in order to draw conclusions about how suppliers – both large and small – can form part of a national broadband infrastructure.

This information about the likely technology mix and supply capacity will inform BDUK's decision about which commercial models could be successful, and specifically how

competitions or procurements would be to structured to achieve the USC and superfast broadband objectives.

3.2 Link to superfast broadband pilots

In parallel with this USC Theoretical Exercise, BDUK has also launched a consultation process to help identify potential locations for the market testing projects (or '"Superfast Broadband Pilots").

The USC Theoretical Exercise is a voluntary, hypothetical 'paper-based' exercise to provide indicative costs and revenues associated with the USC. In contrast, the Superfast Broadband Pilots will involve the deployment of superfast broadband (pursuant to a competitive tender process) that will deliver high throughput and high quality data transport, at affordable rates in rural and hard-to-reach areas and routes which the market is unlikely to serve. These projects will enable BDUK to collect real cost, revenue and benefit data at a granular level, which will help to build a business case for deploying superfast broadband at a national scale.

The responses to this USC Theoretical Exercise will assist in the process to select appropriate locations for the pilots, as BDUK uses the data in evaluating which areas are likely to yield opportunities to test hypotheses for deploying superfast broadband at lower cost (e.g. re-use of utility infrastructure).

4 Description of the USC Theoretical Exercise process

4.1 Explanation of the challenge

Suppliers participating in the USC Theoretical Exercise will be provided with detailed information in relation to each of the three geographies which currently have poor availability of broadband. BDUK is seeking ideas for cost effective and complete coverage 'solutions' in each of the selected areas.

Each area contains approximately 50 'slow-spot' or 'not-spot' postcode locations – i.e. where households and businesses would achieve a less-than-2Mbps broadband connection due to length of copper lines (as modelled by BDUK) and outside of areas with cable areas or 3G cell coverage sufficient to provide a 2Mbps connection.

Information is provided about the known supply of broadband infrastructure, including the location of BT exchanges and cabinets, fibre points of presence, wireless points of presence and masts or alternate structures such as water towers, and utility networks.

Additionally, information is provided about demand, including households and demographics, size and population of SMEs, and public sector locations.

BDUK is asking suppliers to develop complete solutions that will provide coverage to each of those postcodes (i.e. commercially sustainable and consistent with BDUK's definition of minimum standards for the USC – see annex 6) and determine:

1) The theoretical speed each postcode is raised to after the intervention, plus any other spill-over benefits inside or outside the area;

2) the indicative capital and operational costs, the indicative revenue and take-up assumptions, the required project return, and therefore the investment shortfall that would be sought from Government to enable a sustainable project to go ahead; and

3) key assumptions made in the process and their sensitivity.

BDUK is asking suppliers to submit what they perceive as a cost effective solution to the problem in each area, as measured by the level of the investment gap and in relation to BDUK's inter-dependent objectives of delivering USC coverage within the available budget while maximising the deployment of superfast broadband where possible, cost effective and affordable.

The specific questions to be answered in the responses are set out in section 7.

4.2 Supplier participation in the process

Participation in this exercise is entirely voluntary. However, suppliers are encouraged to participate as the conclusions drawn from this study will inform BDUK's commercial strategy,

ensuring that Government funding can be targeted at appropriate segments of the marketplace.

By not participating in this exercise, suppliers miss the main opportunity to demonstrate to BDUK their capability to participate in delivering the USC objective and to influence the shape of future competitive processes.

This process also provides operators with an opportunity to articulate their vision for the future of the UK's data transport infrastructure and its role in supporting future critical government services such as telehealth.

4.3 Who should take part

This USC Theoretical Exercise is aimed specifically at suppliers with UK delivery capability. This is anticipated to include all suppliers in the supply chain – and not only UK incumbent providers and new entrants, but also overseas companies able to expand into the UK.

This process is designed for network operators to declare their interest and ambition to deliver service in rural areas. This includes community network providers who wish to expand services or may prefer to make clear their desire to not extend or offer service in the future.

BDUK anticipates that a mix of technologies will have a role in delivering the USC and superfast broadband objectives, and all technology suppliers are invited to participate in the process to demonstrate cost effective solutions in different geographies and circumstances.

BDUK understands that the availability of a bundle of services and the inclusion of customer premise equipment (CPE) makes a significant difference to the take-up of broadband services, so ISPs are strongly encouraged to participate in this exercise to differentiate the end-to-end services that can be delivered over the infrastructure.

4.4 Suppliers working together to develop solutions

BDUK assumes that for a solution that provides 'complete' coverage and is cost effective is likely to require a mix of technologies (e.g. fibre, copper, radio and satellite) and a mix of services (including access, data transport and ISP services). Therefore it is likely that suppliers will need to collaborate with each other to identify and develop solutions.

Additionally, BDUK anticipates that the economics for delivering superfast broadband as part of the USC solution can be affected significantly by the re-use of existing assets (fixed, mobile, wireless), and BDUK hopes that respondents will collaborate to identify where sharing assets, spectrum and/or services (e.g. marketing) reduces overall costs, in order for BDUK to understand the potential impact such sharing would have.

BDUK is encouraging suppliers who are participating in the USC Theoretical Exercise to engage with other participating suppliers, in order to achieve the most cost effective solutions for this exercise.

To facilitate the formation of such working relationships, BDUK has published details of suppliers attending the London Industry Day on 15th July on the BDUK website (www.bis.gsi.gov.uk/bduk), and will update this list with details of those suppliers who have expressed an interest in taking part in this exercise. Suppliers are encouraged to develop relationships with, and understand the capability of, other suppliers on this list, as appropriate.

Since this exercise is informal and voluntary, rather than part of a competitive commercial process, BDUK suggests that suppliers should not form exclusive relationships at this point, although suppliers may of course require reciprocal NDAs prior to the sharing of certain technical and/or financial details or assumptions.

Suppliers are encouraged to emphasise in their responses how collaboration will help them meet coverage and capacity requirements to achieve the USC objective nationwide, or what support or development of the market is needed to achieve the necessary levels.

4.5 Guidance on choice of solution

BDUK understands that there will be many potential configurations of solutions to each problem area. In providing their response, suppliers are asked to choose the most appropriate solution, in their eyes.

BDUK recognises that suppliers do not have any objective measures (e.g. an affordability envelope or other quantitative evaluation) to enable them to determine what represents a cost-effective solution.

However, BDUK expects all supplier responses will be of value (no matter how they balance the two competing principles: minimising cost to Government, or maximising use of superfast broadband) in understanding the cost-dynamics of solutions, and BDUK would encourage suppliers to describe their choice process in the response.

Suppliers are therefore asked to make a value judgement about how to balance the various factors in their choice of solution, after having taken the following principles into account:

- It is a Government objective to use superfast broadband technologies to solve the USC problem wherever practical, cost effective and affordable. Where non-superfast broadband solutions are necessary, Government seeks to promote technologies with an upgrade path to superfast broadband to minimise wasted investment.

- Solutions must be consistent with State Aid guidelines. For example, recourse to the use of existing infrastructure and technological neutrality as far as possible and a commercial model which would provide wholesale access at the active layer – and additionally at the passive layer for superfast broadband.

- Solutions should presume the existing regulatory framework (as at 15 July 2010), but variant responses are also welcomed, and more information about this process is set out in section 8.3.

- Solutions will be differentiated by the impact they have on an area's broadband throughput and quality: in raising not-spot and slow-spot households' and businesses' connectivity to 2Mbps or higher, with higher access speeds and better quality data transport being valued more than lower access speeds and lower quality data transport.

- BDUK will also recognise the value of any spill-over effect, whether in:

    1) raising the broadband speeds or choice for other households and businesses (e.g. a FTTC upgrade will affect broadband availability to all premises near the cabinet, whether a current slow-spot or otherwise);

    2) improving the quality of the data transport (e.g. from a back-haul upgrade); or

    3) improving the upgrade path to a superfast broadband solution (e.g. by an increased proximity to a fibre point-of-presence).

- Solutions will also differentiate themselves on the commercial attractiveness of the product available to consumers, including the set-up costs and monthly charge to be covered by the consumer, as well as any constraints over usage.

- Solutions should provide customers with a choice of ISPs and products (e.g. through service unbundling, or alternate access technologies for backup) to help promote market competition and provide greater value to households and businesses in a given area.

- The existence of the 2Mbps USC-aligned solution does not preclude the marketing or provision of other solutions.

- In all cases, solutions must be long-term commercially sustainable, such that once the initial capital outlay is funded, the projected future revenues would exceed the projected operational costs by a commercially acceptable margin.

4.6 Scale and location of areas

This section sets out the location and characteristics of the areas chosen for the USC Theoretical Exercise.

Suppliers should note that BDUK's decisions in selecting the size and shape of each area were taken to maximise supplier participation: the areas have been kept reasonably small to keep suppliers' efforts (and therefore costs) in preparing a response low; and the areas are within administrative boundaries rather than exchange boundaries so as to not bias the process towards solutions based solely on the incumbent provider's infrastructure.

Suppliers SHOULD NOT interpret from the structure of this exercise that BDUK will be running a competitive process to award funds for the USC at this same scale – BDUK recognises that many suppliers would consider a individual contract to cover an area of this size as commercially unviable. The responses to the USC Theoretical Exercise will help BDUK establish a commercial model which will run competitions at an appropriate scale to ensure its objectives for cost-effective coverage can be achieved.

5 Logistical information about the process

5.1 Timetable

Milestone	Date
Industry Day held, and USC Theoretical Exercise launched	15 July 2010
Area information available for release to suppliers after completed NDA received	16 July 2010
Suppliers prepare solutions and responses – BDUK team and area champions available for questions *(Note: see annex 3.9 for any specific restrictions)*	19 July – 13 August 2010
Suppliers provide notification of intent to submit responses	26 July 2010
Supplier teams invited to present solutions to BDUK (if responses received earlier than deadline)	23 August – 3 September 2010
Final deadline for submitting responses	3 September 2010

5.2 Contact with BDUK – Q&A process

BDUK will operate a question / answer process during the USC Theoretical Exercise. Suppliers will be able to submit any question to BDUK for a response. Both the question raised and its responses will be published on the BDUK website for all suppliers to view.

Should a supplier or team wish to discuss their proposed approach with BDUK to check their direction, BDUK anticipates it should have the capacity to provide 'check-point sessions' at the end of July or early-August, should these be requested. Similarly, generalised information and advice will be anonymised and published on the BDUK website for the benefit of other supplier's website.

Communications with BDUK should be directed to:

Matt Agar, Broadband Delivery UK, Department for Business Innovation and Skills, 1 Victoria St, London, SW1H 0ET

020 7215 4413, Matt.Agar@bduk.bis.gsi.gov.uk

5.3 Contact with local champion

BDUK has arranged for a local 'champion' to be available in each area. This individual will be the primary point of contact in the relevant area for all participating suppliers, and who will endeavour to answer questions relating to the area not covered by the information provided by BDUK, e.g. geography, demographics or supply infrastructure.

Suppliers are also welcome to visit the areas to develop their understanding of the issues specific to that area.

All contact with the local champions and all visits to the area should be conducted in accordance with the instructions in annex 0.

Contact details for each local champion are provided in annex 3.9.

5.4 Confirmation of participation

Suppliers are requested to advise BDUK as soon as possible after the Industry Day of their intent to submit a response, and in any event by the date set out in the timetable in section 5.1.

Confirmation should be provided to the email address of the contact person identified in section 5.2.

5.5 Supplier costs incurred

As this exercise is entirely voluntary, suppliers will not be remunerated or be entitled to claim for any expenses in participating in the process. BDUK has sought to design the exercise to minimise the cost of participation (e.g. by limiting the size of each area to ~50 not-spot and slow-spot post codes, and by collecting relevant data in advance).

6 Location of the 'real world' areas

This section provides a brief description of each of the three 'real-world' areas. A more detailed description of the data available for each area is set out in annex 3

6.1 South Wales – North of Swansea

The location of the chosen area is the Mawr Community, which encompasses the villages of Felindre and Craig-Cefn-Park, to the North of Swansea. Most of the households and businesses in the area are not-spots and slow-spots due to the distance to each of the 5 local exchanges serving the area.

The area is rural, but not very far from the major city of Swansea. Many of the exchanges connecting the area are unbundled, and include multiple suppliers of wholesale connectivity.

Although households and businesses in the villages are poorly served, several of the village schools in the area have fibre connectivity.

Part of the area is also covered by wireless operated by a small company called TFL-Group, who operates a mast in Felindre, with a microwave backhaul to Swansea. Currently the wireless service is targeted at small businesses rather than consumers.

The edge of the Virgin Media cable network is a few hundred yards from the edge of the chosen area, and around 1.5km straight line distance to the nearest slow-spot postcode.

The M4 motorway runs to the South, and 3G mobile masts are located at some of the local motorway junctions.

The BDUK local champion is Phil Owen, the Regeneration Officer for Mawr Community Development Trust. The role of the local champions is explained in more detail in section 5.3.

6.2 The Scottish Highlands – North of Inverness

The location of the chosen area is the East Sutherland and Edderton Ward to the North of Inverness up the East coast. The area is remote and mountainous, with very low density of households and businesses.

Some of the current not-spots are houses served by an Exchange Activate exchange, where the bandwidth is capped at 512Kbps.

The nearest main city is Inverness, where some operators (e.g. former operator Thus) have points of presence, as well as fibre assets along the East coast to Thurso for serving the oil industry.

In addition, C&W is using fibre and microwave as part of the Pathfinder North project to connect public sector locations.

There is not believed to be any wireless or mobile internet infrastructure in the area, however there are several 2G masts and repeaters in the area.

The BDUK local champion is Andrea Rutherford of Highlands and Islands Enterprise. The role of the local champions is explained in more detail in section 5.3.

6.3 North West England – East of Lancaster

The location of the chosen area is Quernmore and Over Wyresdale: two parish regions to the East of Lancaster, bounded by the M6 motorway, the sides of a valley and Bowland Forest.

There are several BT exchanges serving the area, and BT has announced the deployment of FTTC on the Lancaster Exchange for late in 2010.

Lancaster itself has an independent DOCSIS3 Cable operator, SmallWorld, while the Virgin Media network reaches to around 15km to the South of the area, and Virgin Media's business arm is commencing a deployment of fibre as part of a contract with Lancashire PCTs.

There are a number of wireless deployments in the locale, such as Wray Mesh and Peer to Peer Net along with the CLEO wireless delivery to schools. A TSB-funded feasibility study to use whitespace spectrum for wireless has been completed in the parishes of Abbeystead and Quernmore.

The BDUK local champion is Barry Forde, visiting professor at Lancaster University. The role of the local champions is explained in more detail in section 5.3.

6.3.1 Extended area test

BDUK has also defined an extended area for the Lancaster 'real-world' example, which consists of the two parish regions above plus six further parishes, which together form a contiguous area around the south and east of the city.

The purpose of defining this additional area is to test how the choice and cost of the solution varies with scale and scope. *This will be referred to specifically in one of the RFI questions.*

7 RFI Questions

This section sets out the questions to which suppliers (or supplier teams) should respond. A template is provided as annex 4 to this RFI document, including a spreadsheet proforma for indicative financial information, to capture data in a consistent manner.

Please clearly identify each file with the supplier's (or supplier team's) names.

7.1 Part 1: Questions regarding supplier respondents

Section 1: Information about the supplier / supplier team

Q1.1.1: Is the response submitted on behalf of a single supplier or a team of collaborating suppliers?

Q1.1.2: If the response is submitted on behalf of a supplier team, who are the team members and what are their respective roles? Briefly describe role and area of specific responsibility for each member.

Q1.1.3: What experience do the supplier team members have of working together previously, if any?

Q1.1.4: Who is the supplier team's primary contact person? Who are the primary contacts of other supplier team members, if any?

Section 2: Information about individual suppliers

Q1.2.1: Please provide the following information (for each supplier in the case of supplier team).

a. *Company details*: Company name, Trading name, Company incorporation number, Company Website, Address of registered office, Name of parent company (if appropriate).

b. *Core business description*: a brief description of the nature of the supplier's core business.

c. *Background and experience*: a description of the supplier's background, services, experience and qualifications.

d. *Areas of operation*: a brief statement detailing where the supplier's main operations are based and significant areas of current and potential future presence in the UK.

e. *Target market*: Outline the area or areas of the UK where the supplier has an interest in serving and the relevant assets already in place in the area. Outline the supplier's proposition or positioning relative to alternate suppliers in the area (e.g. business focus, backup solution, fill-in option).

f. *'Future strategy:* Describe the supplier's perspective on what precise role its solutions play long term in the UKs national data transport infrastructure.

g. *Financial capacity*: last 3 years' (if appropriate) revenue figures – preferably for UK business. Set out the supplier's preferred financing arrangements in order to provide solutions to cover USC locations on a wider scale.

7.2 Part 2: For each of the three areas

Section 1: Description of the impact on the coverage area

Q2.1.1: Please provide an overview of the supplier's / supplier team's proposed solution for the chosen area, in terms of the deployment and relative importance of different access and backhaul technologies. Please identify the components technologies that make up the solution (e.g. satellite / wireless / VDSL).

Q2.1.2: Please describe the impact on potential 'up to' broadband speeds that would be available after the submitted solution has been implemented. Please also describe the 'edge of network' experience and the proposed peak-hour planning rules for the components of the network under your control (e.g. backhaul and internet gateway) (e.g. users receive 2Mbps, 90% of time during peak 3 hours). Please compare the capability of your solution with BDUK's baseline technical definition of 2Mbps USC (set out in annex 6) and identify where it varies from that definition (e.g. higher latency, lower download access speed, lower throughput at peak times) and the likely impact on the customer experience.

Q2.1.3: What ISPs services are available included in the solution? What are the key details of the products available, including costs and limitations? Are these existing products, or would they be created specifically for this market segment?

Q2.1.4: Please provide a hard-copy and electronic-file (ESRI shape file format or MapInfo file) map of the coverage area, including identifying both the network assets and the modelled broadband speed at each postcode location, following the instructions set out in annex 5 and using the response template spreadsheet described in annex 4.

Q2.1.5: Please confirm that the solution has been prepared on the basis of the current regulatory structure. If providing a variant response, please explain the dependencies or assumptions that have been made and their impact on the choice and cost of solution.

Section 2: Description of the solution architecture.

Q2.2.1: What technologies / suppliers were chosen for the solution, and why?

Q2.2.2: What new network infrastructure would need to be built to achieve this solution?

Q2.2.3: What other technologies / solutions were considered, and why were they de-selected?

Q2.2.4: How is the solution scalable? What redundancy is there in the solution? What is the upgrade path, if any, for those regions that wouldn't initially be provided with next generation access?

Q2.2.5: Where radio spectrum is used, identify what spectrum is licensed and unlicensed, and what are the risks due to other operators working in interfering channels.

Q2.2.6: Please confirm if the solution uses any proprietary components and if so, who owns the rights and benefits from licences in relation to such proprietary components.

Q2.2.7: Please describe the communication standards to which your service is built?

Q2.2.8: Please confirm that the solution has been prepared on the basis of the current regulatory structure. If providing a variant response, please explain the dependencies or assumptions that have been made and their impact on the choice and cost of solution.

Q2.2.9: Please list any dependencies or assumptions you have made that are critical to the success of the solution proposed?

Section 3: Consideration of geography

Q2.3.1: How did the geography of the area (e.g. topography, terrain, population density) affect the choice of solution?

Q2.3.2: Would the choice of solution have been materially different if the area had been different (e.g. if the boundary had included or excluded a region)?

Q2.3.3: Would the choice of solution have been materially different if a bigger area had been chosen (e.g. an area twice as large, an entire local authority, or an entire county)? Would the cost per household have been materially different if a larger / smaller area had been chosen?

Note: In the case of the Lancaster 'real-world example' the original area is quite small. An alternate map has been included that encompass a much larger area. This larger area is offered to enable suppliers to illustrate how the solution might be chosen differently at a different scale with reference to specific examples.

Section 4: Consideration of deployment

Q2.4.1: Please describe how the solution would be deployed. Who would build it? In what stages would it be built, and over what timescale? How many households and businesses would receive improvements in coverage at each stage? Please list any dependencies or assumptions made.

Q2.4.3: Please provide short descriptions of any relevant and comparable projects that the supplier / supplier team has/have been involved in, drawing specific parallels to key features of the solution.

Section 5: Calculation of indicative costs

Q2.5.1: By breaking the solution into component infrastructure and deployment activities, please provide indicative capital and operating costs at the most granular level possible (e.g. civil engineering, cabinet installations, back-haul, end-user equipment).

Note: suppliers are requested to use the proforma supplied if possible.

Q2.5.2: Please list any dependencies or assumptions made, and describe the sensitivity of the total indicative cost to that assumption. (e.g. assumed fibre can be pulled through an existing duct at a cost of £5/m, but if it were necessary to lay a new duct, this would be £50/m).

Q2.5.3: Suppliers are also invited to provide their perspective on the indicative costs of extending their solutions to those other areas where they have made an expression of interest.

Note: suppliers are reminded that any confidential information they supply will be subject to the confidentiality undertaking, and will not prejudice their submissions in any future procurement exercise.

Section 6: Calculation of indicative revenues

Q2.6.1: Please provide an indication of your view of the addressable market and the modelled take-up of households and businesses served by each component of the solution over time (annual figures, or more granular if available).

Note: remember to consider revenue from non-'not spots' and outside the selected area to correctly model income related to each asset – e.g. model revenue based on all beneficiaries within range a wireless solution (i.e. 25km radius or other), rather than just those inside the chosen area where applicable.

Q2.6.2: Please provide an indicative value for modelled average revenue per 'user' – i.e. per household – for households and businesses served by each of the component technologies over time (annual figures, or more granular if available).

Q2.6.3: Please provide an indicative value for any additional modelled revenue (e.g. from SMEs, wholesale rentals)

Q2.6.4: Please indicate if you have modelled take-up and average revenue differently from baseline / national / regional assumptions.

Q2.6.5: Please list any dependencies or assumptions made, and describe the sensitivity of the indicative annual revenues to that assumption.

Note: suppliers are reminded that any confidential information they supply will be subject to the confidentiality undertaking, and will not prejudice their submissions in any future procurement exercise.

Section 7: Calculation of indicative returns and investment gap

Q2.7.1: Please provide an indicative target project IRR (or pay-back period), for each supplier or component technology of the solution.

Q2.7.2: Please calculate, therefore, the investment gap that would need to be funded by Government, in order to make each component technology viable.

Q2.7.3: Please list any dependencies or assumptions made, and describe the sensitivity of the indicative investment gap to that assumption.

Note: suppliers are reminded that any confidential information they supply will be subject to the confidentiality undertaking, and will not prejudice their submissions in any future procurement exercise.

8 Supplier responses

8.1 Form of the report

Suppliers are asked to provide a written report as an output of the USC Theoretical Exercise, that provides information about the participating supplier(s) and their capabilities, and describes and illustrates – for each area – the chosen solutions and calculations of indicative cost, revenue, and investment gap, by responding to the questions set out in section 7.

There is no restriction on the length of the report, but BDUK anticipates that a maximum of 10 pages is necessary to describe the respondent organisations and their relationships, and a maximum of 20 pages is necessary to describe the solution for each area (with a supplementary spreadsheet to provide calculations) – although suppliers may also prepare variant responses as described in section 8.3

BDUK's preferred template for supplier responses is provided as annex 4 to this document.

Reports should be provided in a printed colour form, with separate (clearly cross-referenced) charts where illustrative. Two printed copies should be provided. Responses should be mailed to the contact details provided in section 5.2.

Reports should also be provided in electronic form, using MS Office 2003/2007 format for the report and ESRI shape file for any maps. Responses should be emailed to the contact details provided in section 5.2.

The deadline for submission is set out in the timetable in section 5.1.

8.2 Request for complete responses

Understanding how different solutions are chosen in different geographies is key for BDUK, so participating suppliers are strongly encouraged to complete the exercise and provide a report that covers all three areas.

8.3 Variant responses

BDUK requests that suppliers (or supplier teams) prepare responses based on the current regulatory framework (including existing restrictions on infrastructure sharing and passive infrastructure access).

However, BDUK acknowledges that Ofcom is currently consulting on potential changes to the regulatory framework.

If a supplier's / supplier team's solution could vary significantly as a result of a change to the regulatory system, then the supplier / supplier team is encouraged to prepare a variant response to illustrate the impact that the change would have on either broadband provision or quantum of Government investment required in the area.

The variant response needs to clearly describe which dependencies or assumptions have been made about changes to the regulatory framework.

8.4 Presentation

Suppliers (or supplier teams) who are able to submit responses in advance of the final deadline will also be invited by BDUK to present and discuss their solutions. The timings for those presentations are set out in the timetable in section 5.1.

9 What BDUK will do with the output

BDUK will compare and contrast the various responses it receives in order to draw conclusions regarding:

- the capability and appetite of the marketplace to provide solutions;
- the capabilities and cost effectiveness of various technologies in different geographies;
- commercial barriers to deployment; and
- indicative aggregate costs for business case purposes.

Subject to the terms of the confidentiality undertakings, BDUK intends to summarise and communicate its learnings from this USC Theoretical Exercise to suppliers in due course, and before commencing any commercial process.

Commercial model

By extrapolating from supplier responses, BDUK intends to understand the choice of cost effective solutions for the whole of the UK, which will inform the choice and configuration of the commercial model (or models) BDUK chooses to deploy.

For example, supplier responses may indicate that one type of access technology is a cost effective solution in many cases, but that the market-place doesn't currently have the capacity to deploy in the volumes needed at a national level. In this case, a UK solution would need to accommodate limited capacity or encourage new market capacity.

Location of superfast broadband and standard broadband

BDUK will combine its knowledge of the national distribution of the UK's different geographies (geotypes) with its modelling conclusions to model which USC not-spots and slow-spots a standard broadband solution is cost effective, and which areas can will enable a superfast broadband solution to be delivered cost effectively.

USC business case

BDUK will calculate an aggregate cost (to Government) of USC deployment for the purposes of developing the business case for USC deployment.

10 Confidentiality and disclosure

10.1 BDUK-provided data

To take part in the USC Theoretical Exercise, suppliers will need access to the set of data that describe the level of broadband availability in each area and the existing supply infrastructure.

As this data set includes confidential information supplied by providers, BDUK requires suppliers who intend to participate in the exercise to sign a confidentiality undertaking to confirm they will treat this information confidentiality.

The terms of the confidentiality undertaking, together with the process for signature are set out in annex 1.

10.2 Supplier-provided data

BDUK acknowledges it may receive confidential information from suppliers in their responses. The confidentiality undertaking set out in annex 1 is mutual, to provide suppliers assurance that their information will be treated confidentially.

Any financial information provided by suppliers through the process is understood to be indicative, and information submitted will not prejudice any future competitive exercise.

Annexes

1 Confidentiality agreement

This annex sets out the terms of the Confidentiality Agreement which must be entered into as a condition for the release of data relating to the USC Theoretical Exercise.

The following process shall apply to expedite signature by both parties whilst ensuring that mutual, valid and binding undertakings are entered into:

- Suppliers should confirm by email (see contact details provided in section 5.2) their intention to participate in the USC Theoretical Exercise and provide details of

    1. the contracting party the supplier is proposing will sign the Confidentiality Agreement, including the name of the legal entity (e.g. X Limited), company number (if registered) and principal place of business or registered office address; and

    2. the name and contact details of the supplier's nominated representative to whom a 'signature-ready' Confidentiality Agreement (see below) and any queries relating to the Confidentiality Agreement should be sent.

- BDUK will then send (by email) to the supplier's nominated representative a 'signature-ready' Confidentiality Agreement (i.e. which includes the supplier contracting party's details) for signature.

- An authorised signatory of the supplier contracting party should sign two copies of the Confidentiality Agreement and return both copies to BDUK (see contact details provided in section 5.2). BDUK will accept a scanned signed copy which is emailed provided hard copy originals follow promptly in the post.

- At this stage BDUK will be able to release the data relating to the USC Theoretical Exercise.

- BDUK will then arrange for both copies of the Confidentiality Agreement to be signed on behalf of the Secretary of State for BIS and dated. One of the signed copies will be sent to the supplier's nominated representative and the other retained for BIS' records.

USC Theoretical Exercise - NDA 1.0 Fi

2 Code of conduct – local champion enquiries and area visits

It is possible for suppliers for complete the USC Theoretical Exercise using the data provided by BDUK. However, in order to develop optimal solutions tailored to local area characteristics, suppliers can access a network of local champions who have agreed to support the exercise. These local champions can facilitate supplier research into local issues by providing additional data and arranging site visits where possible.

Where suppliers choose to use the local champions, or intend to visit the local area, they must adhere to the following code of conduct.

2.1 Contact with local champions

- There may be restrictions on contacting local champions (e.g. unavailability due to holidays) – these are set out in annex 3.9.
- Suppliers should be patient and reasonable in their expectations – supporting the USC Theoretical Exercise is additional to the local champions' normal roles and they may not be able to respond to questions immediately, or may not be able to fully answer all questions.

2.2 Visits to the area

2.2.1 Before the visit

- Site-visits should be arranged through the local champion. Suppliers should provide sufficient advance notice of their intention to visit, and be clear about their objectives, identifying any practical support requested of the local champion.

2.2.2 During the visit

- Suppliers must avoid being intrusive as much as possible. There must be no contact with households and businesses without agreeing and coordinating with local champion first.
- Suppliers must not try to obtain access to any property that they haven't agreed access to in advance.

2.2.3 After the visit

- Suppliers are encouraged to follow-up with the local champion after the visit, including testing conclusions and sharing any findings that will be of interest to the local champions.

3 Data book for each area

The Data Book for each area comprises:

- a set of PowerPoint slides – containing an overview of each category of data that BDUK is supplying and an example of the maps that can be generated from the data.
- an Excel workbook – containing the data tables.

Both the slides and the workbook are structured by the nine categories listed below, and the following sections indentify and describe the fields provided in each:

1. Area boundary
2. Population and geography
3. Broadband speeds
4. Telecoms supply infrastructure
5. Utilities supply infrastructure
6. Demand indicators
7. Public sector locations and network
8. Regulatory and State Aid
9. Local champion contact details

3.1 Area boundaries

PowerPoint: Map 1

Excel filename: Data Book – {area name} / Worksheet 1 "Boundary"

Content: Identifies the boundary file for the example area, which can be downloaded free of charge from OS OpenData.

3.2 Population and geography

PowerPoint: Map 2 and Map 3.

Excel filename: Data Book – {area name} / Worksheet 2 "Population"

Content:

- Postcode
- Domestic delivery points

- Non-domestic delivery points
- Buildings
- Geotype (Analysys Mason's classification of exchange areas)

3.3 Broadband speeds

PowerPoint: Map 4

Excel filename: Data Book – {area name} / Worksheet 3 "Broadband speeds"

Content:

- Postcode
- Town/Community
- Serving BT Exchange
- Modelled distance from centre of postcode to the exchange (assuming relevant xDSL)
- Modelled current theoretical speed
- Modelled practical speed, based on a sample of measured line speeds
- Serving BT cabinet (PCP ID)
- Modelled distance from the centre of the postcode to the cabinet
- BDUK not-spot or slow-spot (Yes/No)
- BDUK not-spot or slow-spot households
- BDUK not-spot or slow-spot businesses

3.4 Telecoms supply infrastructure

PowerPoint: Map 5, Map 6, Map 7

Excel filename: Data Book – {area name} / Worksheet 4 "Supply infrastructure"

Table 4a: BT Exchanges covering the case study area

- Exchange code
- Exchange name
- Residential lines
- Business lines

- Exchange not-spot households
- Exchange not-spot businesses
- Case study not-spot households
- Case study not-spot businesses
- Easting
- Northing
- ADSL
- LLU operators
- Exchange Activate (Y/N)
- WBC-enabled (Y/N)
- FTTx planned (Y/N)

Table 4b: BT cabinets covering the case study area

- Cabinet ID
- Easting
- Northing
- Modelled PCP to exchange line length

Table 4c: Virgin Media coverage

(i) Within the case study area

(ii) Within a 6km radius of the case study area centre

- Postcode
- Town/community
- Virgin Media broadband coverage (Y/N)

Table 4d: Wireless masts within 20km of the case study area centre

- Operator
- Services provided
- Easting

- Northing

Table 4e: Arqiva portfolio

- Site ID
- Site name
- Easting
- Northing
- Site type
- Town

Table 4f: Mobile masts within 20km of the case study area centre

- Operator
- Easting
- Northing
- Site name

Table 4g: List of alternative network (Altnet) core network providers operating in the region

3.5 Utilities supply infrastructure

PowerPoint: Map 8

Excel filename: Data Book – {area name} / Worksheet 5 "Utilities"

Table 5a: Electricity pylons within 20km of the case study area centre

- Site ID
- Easting
- Northing

Table 5b: Electricity substations within 20km of the case study area centre

- Site ID

3.6 Demand indicators

PowerPoint: Map 9, Map 10, Map 11

Excel filename: Data Book – {area name} / Worksheet 6 "Demand"

Table 6a: Household density

- Postcode
- Homes per sq km

Table 6b: Business density

- Postcode
- Businesses per sq km

Table 6c: Socio-economic index

- Postcode
- Socio-economic ranking (quintile)

3.7 Public sector locations and network

PowerPoint: Map 12

Excel filename: Data Book – {area name} / Worksheet 7 "Public sector"

Content:

- Location category
- Easting
- Northing
- Connectivity (where available)

3.8 Regulatory and State Aid

PowerPoint: Map 12

Excel filename: Data Book – {area name} / Worksheet 8 "Reg & State Aid"

Content:

- Postcode
- WBA market
- State Aid Black/White/Grey (indicative)

3.9 Local champion contact details

Excel filename: Data Book – {area name} / Worksheet 9 "Local champion"

3.9.1 North Highlands

Contact Name:	Andrea Rutherford
Role:	Telecoms Development Manager
Organisation:	Highlands and Islands Enterprise
Contact details:	01851 612383, andrea.rutherford@hient.co.uk
Availability:	Normal working hours until the end of the process

3.9.2 South Wales

Contact Name:	Phil Owen
Role:	Regeneration Officer
Organisation:	Mawr Community Development Group
Contact details:	01792 781521, phil.owen@mawrcommunity.org.uk
Availability:	Normal working hours until the end of the process

3.9.3 Lancaster

Contact Name:	Barry Forde
Role:	Networking and Telecommunications Consultant
Organisation:	n/a
Contact details:	07866 317601 (during office hours) Barry.Forde@gmail.com
Availability:	Normal working hours until Friday 30 July No contact between Friday 30 July and Monday 16 August Normal working hours after Monday 16 August

3.10 List of all maps

- Map 1: Case study area boundary
- Map 2: Case study boundary with not-spots
- Map 3: Case study surrounding area with not-spots
- Map 4: Broadband speeds and not-spot households
- Map 5: Openreach infrastructure serving the case study area
- Map 6: Virgin Media coverage area

- Map 7: Radio and mobile masts within 20km radius
- Map 8: Electricity infrastructure within 20km radius
- Map 9: Households density
- Map 10: Business density
- Map 11: Socio-economic indicators
- Map 12: Public sector locations

4 Response template document

BDUK has provided templates for suppliers to follow in presenting their responses:

- "RFI Response template.doc": a document containing a simple tabular form to capture qualitative information in response to the RFI questions listed in section 7. BDUK strongly requests that suppliers respond using the templates provided.
- "RFI Indicative Investment Model spreadsheet.xls": a sample spreadsheet to illustrate how investment gaps can be calculated from indicative costs and revenues. Instructions have been included to explain how a supplier can re-use the model for including indicative costs for its own solutions to the required level of detail. Suppliers are also able to use their own preferred format if they wish.
- "RFI Solution spreadsheet.xls": a spreadsheet to capture the modelled potential speed improvement for each postcode, and identify the ISP service or services available at each location. Full instructions for its completion are set out in annex 5.2. BDUK strongly requests that suppliers respond using the templates provided.


RFI Response template v0.1a.doc


RFI Indicative Investment Model spr


spreadsheet v0.1.xls

5 Response template tables and maps

5.1 Solution maps

BDUK is requesting suppliers provide as part of their response, an illustration of their solution in map form, identifying key components of their solutions and the coverage of each.

Suppliers are welcome to provide additional graphics to illustrate their solutions better, where appropriate.

5.2 Solution data tables

As part of BDUK's requested format for supplier responses, BDUK has provided a spreadsheet template in annex 4 to capture comparable quantitative data on the impact of suppliers' solutions.

Suppliers should use the template to provide the information set out as follows.

- For each postcode:
    - The new theoretical maximum broadband speed modelled by the supplier
    - The choice of ISP products available (cross-referenced with the information below)
    - Confirmation of whether the broadband provision meets BDUK's baseline technical definition of 2Mbps broadband (see annex 6)
- For each ISP service:
    - Whether currently available in the marketplace
    - The customer's install costs (after any government subsidy)
    - The customer's monthly rental costs
    - The customer's contract length
    - Data transport planning rules
    - Inclusive services (e.g. free calls)
    - Monthly data cap and/or throttling policy

6 BDUK baseline definition of 2Mbps USC

In completing their responses, suppliers or supplier teams are asked to identify the theoretical improvement in speed of individual post-codes. As well as quantifying the improvement in maximum potential speeds, suppliers will need to confirm in their responses whether the service meets this technical definition, or identify any variation from the standard and the impact on the customer experience.

6.1 Baseline consumer definition

BDUK has created a customer-facing definition for overall experience of broadband provided under the USC, to explain to the public what they should expect from the policy

The customer experience of USC-defined broadband is expressed as:

- enabling users to conduct effective home working, for example:
    - watching good-quality (i.e. low level of interruption) Standard Definition video stream, e.g. iPlayer, most of the time
    - providing acceptable basic video conferencing, e.g. Skype, most of the time
- enabling users sufficient to provide access to online Government services, e.g. tax self-assessment form

The following assumptions are assumed to be met:

- in-home wiring is not a limiting factor
- service delivered on an up-to-date computer and up-to-date browser and driver software
- no other active network devices in-use within the household
- access and data transport network is not subject to contention and loading in excess of that anticipated through prudent network planning and management

6.2 Baseline technical definition

BDUK has also developed market-facing definitions for USC. Different technologies have different access and data transport capabilities, so currently BDUK is maintaining several variations on the definition, until it is able to determine the minimum acceptable standard required to meet the policy objective.

In this document, BDUK presents its baseline definition for 2Mbps USC:

- Connection capable of at least 2Mbps download speed measured at CPE

- Access offering throughput of at least 2Mbps for 90% of the time during the busiest 3 hour period daily
- Access offering throughput of at least 256Kbps upload speed for 90% of the time during the busiest 3 hour period daily
- Access to an ISP such that end-to-end latency, jitter (packet delay variation), and packet-loss between CPE and ISP's internet gateway is adequately controlled to maintain 2Mbps throughput and customer experience for different packet sizes under peak-time loading.
- Access to an ISP product whose data volume limit, throttling and packet prioritisation policy is made transparent and is in line with current market practice, but in any case no less than 5GB per month.
- Access to an ISP product with an install and monthly charge comparable with typical, comparable retail reference price, e.g. BT Retail.