D3.3.1 Cost-Benefit Analysis

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A presentation by

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Scope of Presentation

- Need for cost benefit analysis
- Who benefits from and types of benefits
- General points about the importance of broadband
- Benefits - sources of evidence
- How to model the benefits of satellite deployment
- Communicating the results

Need for cost-benefit analysis

Need for Cost-Benefit Analysis (CBA)

- To show the **Return-on-Investment** (RoI) of investment of public funds
  - = Demonstrating ***value for money***…5:1, 10:1, 30:1
  - = Allowing policy makers/funders to ***compare*** broadband interventions against investment in other policy areas
  - = Enabling comparison between different ***options*** for broadband intervention

What does a cost-benefit analysis look like?

- Typically a **cash-flow spreadsheet**
  - = Time across the top – 10, 15, 20 years
  - = Monetised ***beneficiary*** costs + benefits down the side
  - = Totalled at the bottom for each year
  - = Annual balances are added up using the ***Net Present Value function*** (NPV) @ 3.5% (typically)
  - = This gives the ***net additional benefits*** of the project
  - = This is divided by the 'investment' to calculate **RoI/VfM**

Who benefits and types of benefit

Types of benefits and beneficiaries

- **Economic**
  - Firms – small, medium (and large)
  - Use of ICTs boosts productivity, innovation and enterprise
  - Digital connectivity is an increasingly essential component of ICTs
- **Social/ Community**
  - Education
  - Access to jobs
  - Access to health and other services
- **Public Sector**
  - Service delivery cost savings – via online transactions
  - Schools
  - Health

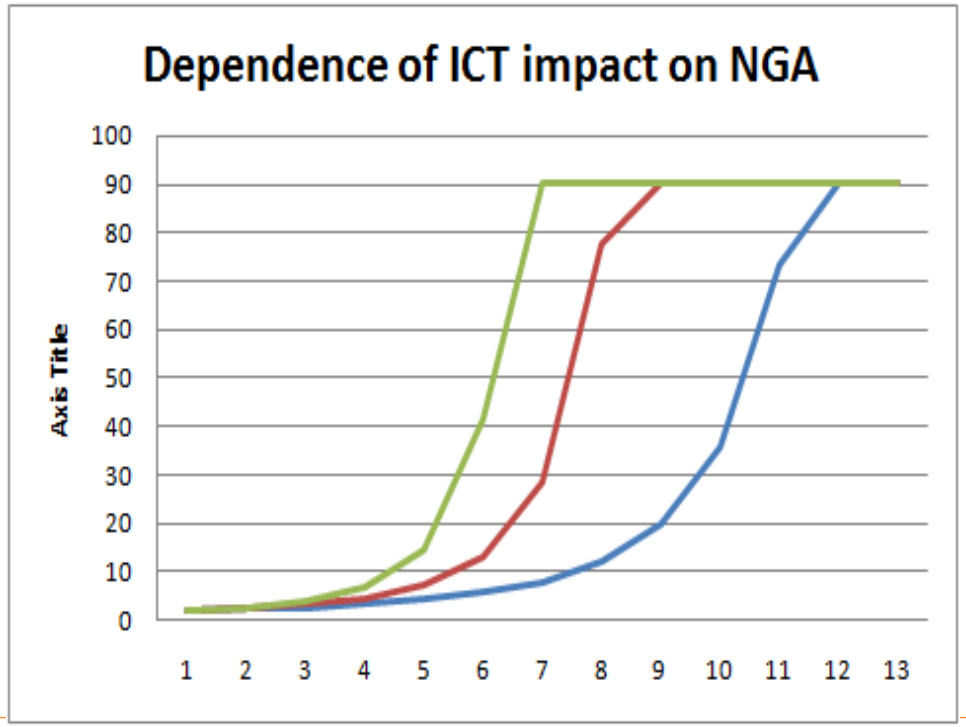
Typical benefit metrics

- **Economic – SMEs**
  - = Net additional GVA
  - = Equivalent jobs
- **Social – households**
  - = Cost savings
  - = Increased lifetime earnings
- **Public services**
  - = Cost savings
  - = Increased quality ‘relative value’ of services

Some general points about the importance of broadband

How much impact does broadband have?

- The importance of broadband, to firms, to households, to public services is almost entirely **relative**
  - = Relative to what everyone else has



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The impact of **NOT HAVING** broadband

- **…..it is not far off becoming terminal**
  - = SMEs cant compete and close or relocate
  - = Start ups cant start or start somewhere else
  - = Home working cant happen
  - = Inward investors wont come
  - = Households increasingly disadvantaged
  - = Houses wont sell
  - = Tourists wont rent holiday homes, stay in hotels
  - = NOT HAVING BROADBAND increasingly contributes to decline of whole community
  - = Public services inefficient….and…have to deliver more to declining community

Benefits – sources of evidence

Benefits – sources of evidence

- **Benefits to SMEs**
  - = Evidence of the benefits of ICTs – of which broadband is a component
  - = Direct evidence of the benefits of broadband
    - o Macro-economic studies
    - o Surveys
    - o Programme evaluations
    - o Case studies
  - = Evidence of benefits of 1st generation broadband, of 2nd generation broadband
  - = Evidence is just emerging of super fast and ultra fast broadband
- **Benefits to households**
  - = Evidence from digital exclusion studies
  - = Thematic evidence – retail sector (re shopping online); home working studies etc
- **Benefits to public sector**
  - = eGovt studies/ strategies – evidence of unit cost savings in particular
- **Wider benefits to the area**
  - = Little available

McKinsey & GMI Study (2011)

- Internet accounts for **3.4% of GDP** growth in 13 countries
  - and **21% of GDP growth** in the last five years of the more mature countries.
- 2.6 jobs are created for every one that is lost in SMEs
- ….with **10% productivity** growth for SMEs.
- The Internet's impact accounts for 21% of developed countries' GDP growth over the last 5 years
- Most of the economic value created by the Internet falls outside of the technology sector
  - 75% of the benefits captured by companies in more traditional industries.

Internet Matters: the Net's sweeping impact on growth, jobs and prosperity

Impact of Broadband
Ericsson, ADL and Chalmers (2011)

- Study of 33 OECD countries by Ericsson, Arthur D. Little and Chalmers University of Technology
  - Doubling the broadband speed increases GDP by 0.3%
  - Quadrupling of speed equals 0.6% GDP growth stimulus.
  - 10 percentage point increase in broadband penetration GDP increases by 1 percent
  - **Total = 1.6 percentage point GDP increase**

Latest evidence from UK

- Govt Agency study of rural gap filling programme
  - = Super fast broadband will add £17 billion (0.07 percentage points) to UK's GVA by 2024.
  - = Rural gap funding superfast programme will add **£6.3 billion p.a.** by 2024, equivalent to an uplift of 0.03 percentage points on the UK's real annual GVA growth

Latest from UK
22-city ultrafast broadband impacts

- Adroit Economics has just completed a series of case studies showing benefits to firms of ultra fast broadband
  - = This was for Govt agency, to go on an information website
  - = Case studies were in-depth, got to the bottom of how firms use broadband, and put numbers on the cost savings and productivity gains
  - = The case studies include videos of firms explaining the benefits – powerful

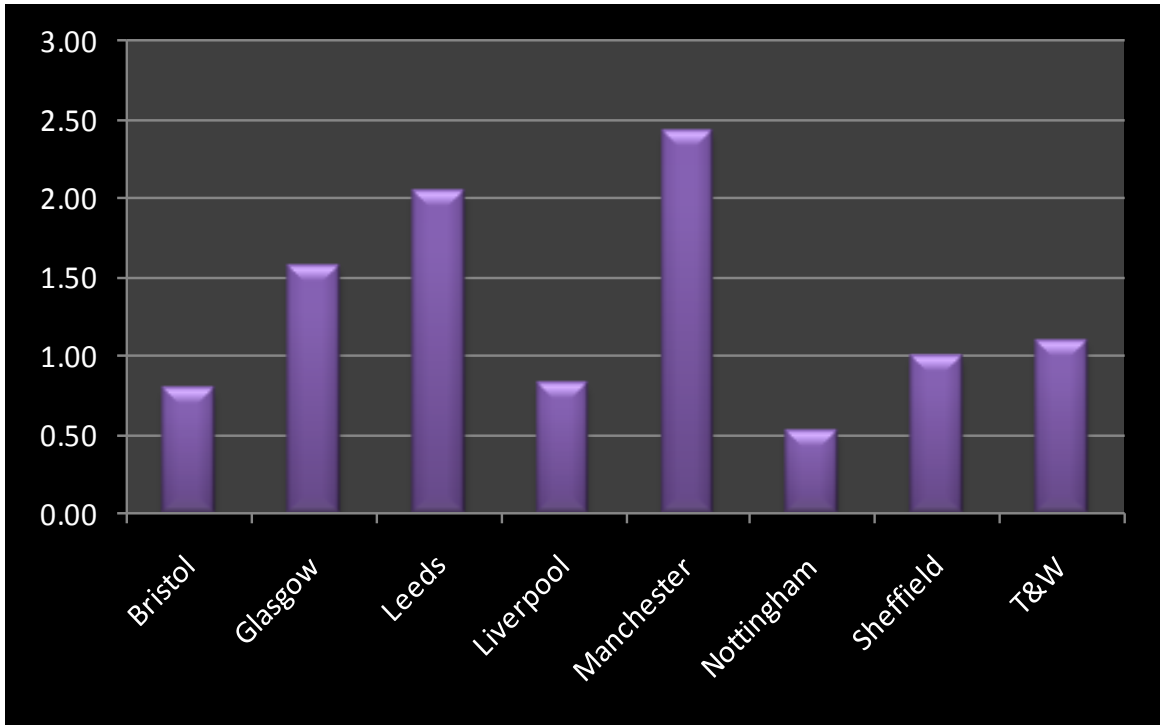
Results from 22-UK city SME ultrafast broadband impact case studies

- Results were surprising
  - = **Benefits substantial** – very significant implications for economy
    - Time saving, cost saving, increased productivity, increased customer service, increased market share, expanding into multiple offices and countries so much easier
  - = **Common types of technology**/ application and services
    - VOIP; Video Conferencing, Large fill sharing/ joint working, Back-up and disaster recovery, Cloud, home-working, mobile working
  - = **Overall message of bandwidth congestion**
    - Might be OK if one person is doing lots of things on the internet, not if all 5 or 10 people in the office are – slow, crashes, drop outs

Examples of broadband benefit models

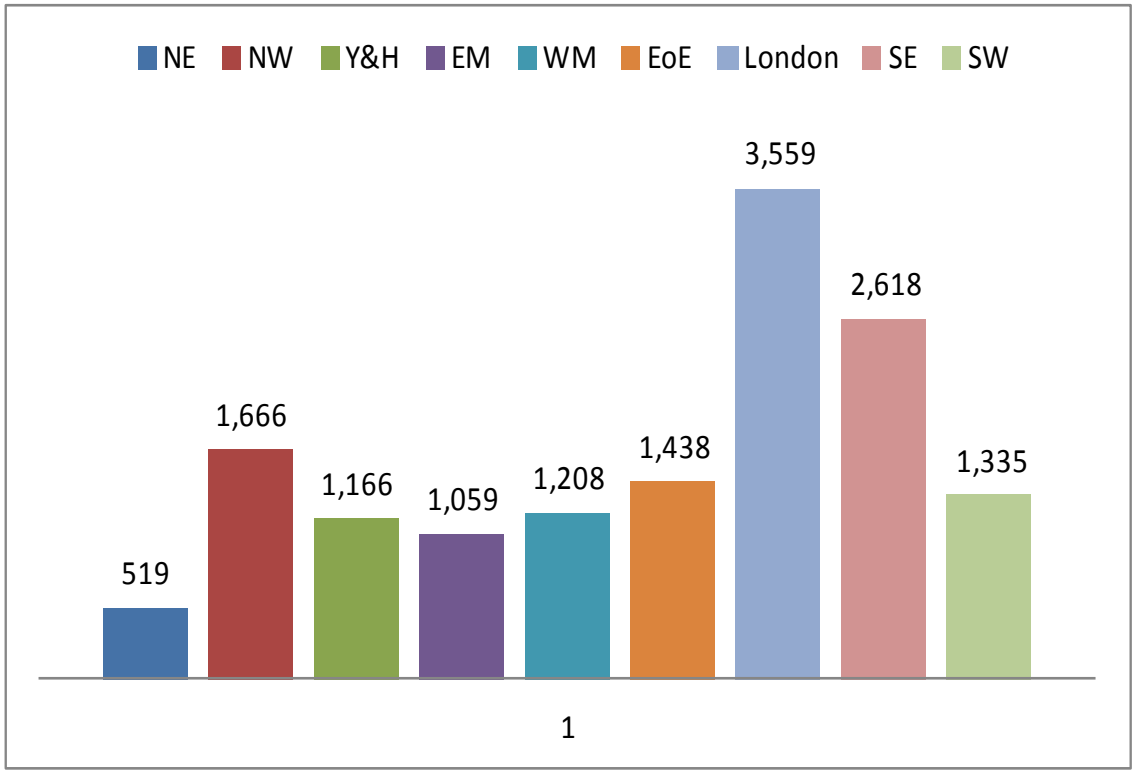
Examples of our broadband benefit models

- Adroit **SME ICT impact model**, created for UK's IT skills council
- Estimates GVA impact of all ITCs, of which broadband is a component
- **£bn 5-7yrs**



Examples of our broadband benefit models

- Adroit **SME ICT impact model**…contd.
- Of which, due to faster broadband
- **£m**

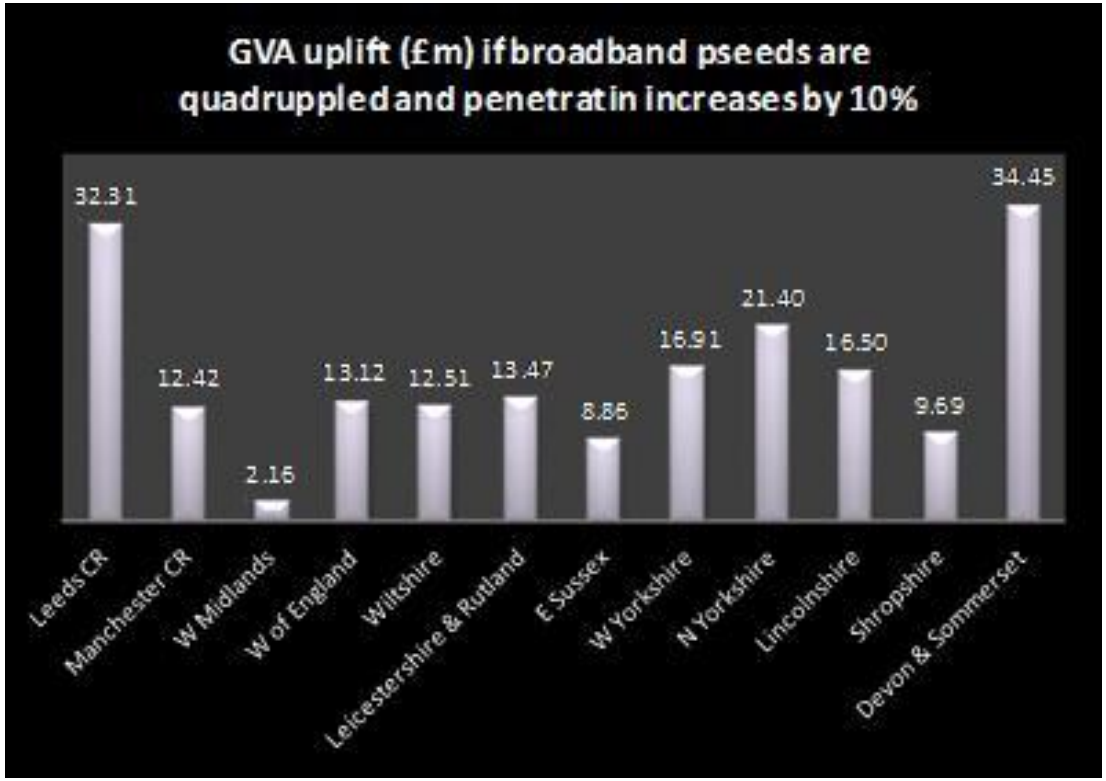


Examples of Adroit's broadband benefit models

- **Benefits of ultrafast broadband to SMEs in 22 UK cities**
  - = **10-15% time saving** – staff can then use this time more productively. As an economist, I can tell you this represents a big productivity increase
  - = **5-10% cost savings** – phone, travel to meetings, back-up, disaster recovery, software – [costs depending on company - still to be modelled]
  - = **5-10-50-200% plus increased sales** - better customer service, tie-in….selling more to existing customers, to new customers…expanding into new offices, new countries, a lot easier
  - = **Transformational** – 30-40% productivity increases, through to being able to stay in the game
- Wider
  - = Home working, mobile working – more productive
  - = Reliability, reduced risk re manual back up

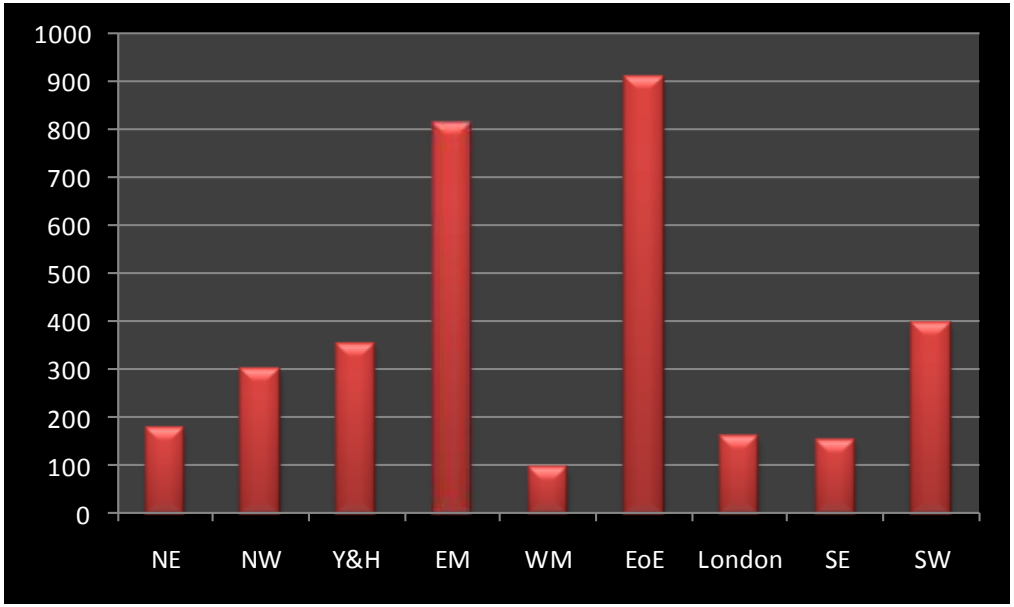
Examples of Adroit's broadband benefit models

- Adroit **rural bb gap filling impact model**
- Estimates GVA impact if **100% of white area covered** and taken up
- **£bn 5-7yrs**



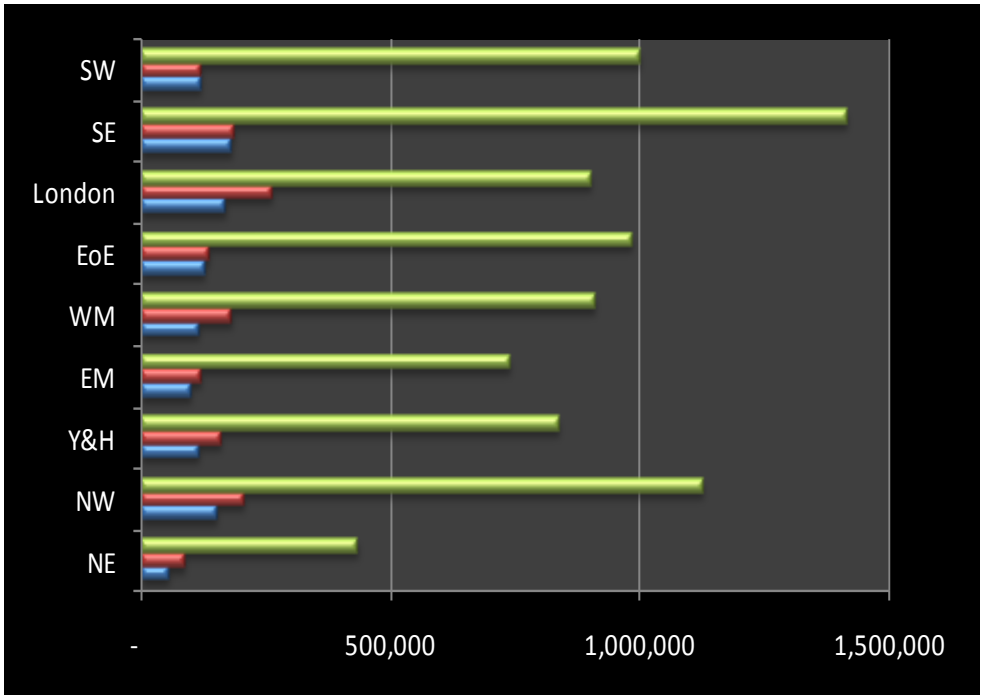
Examples of Adroit's broadband benefit models

- Adroit **digital exclusion model** created UK's IT skills council
- Estimates lost benefits for households if not on the internets
- **Additional lifetime earnings £m from improved education results GCSE**



Examples of Adroit's broadband benefit models

- Adroit model used for Scottish Highlands
- Estimates **public service efficiencies** derived from household internet use
- **Reduce visits to the doctor – translates into cost savings**



How to model the benefits of satellite deployment

How to model the benefits of satellite deployment

- Use an excel spreadsheet
- Use simple formula – no complicated black box stuff
- Formulate a ‘calculation logic chain’
- Sensitivity testing, scenario (range) modelling
- Risk assessment (if required) Monte Carlo etc.
- Audit trail critical – show source of every input and basis of every assumption

Impact logic chain

No of beneficiaries affected by gap * lost benefit = policy target

Target Area

- White area
- Not covered by superfast

Beneficiaries

- No. & type of SMEs
- No. & type of households

UNIT Benefits

- SMEs - GVA uplift due to bb
- Households – monetised benefits
- Public services – cost savings

Take-up

- Rollout scenarios
- Take up scenarios
- Optimisation scenarios – factor in ICT support (i.e. e-skills UK online IT guide)

Some key Issues – satellite broadband impact modelling

- **Where to get data on No. & type of beneficiaries?**
  - = Start with high level estimates – applying top-down metrics
  - = Follow with local mapping/ surveys
- **What impact evidence is best?**
  - = Start by using growing body of existing evidence
    - o **Top-down** – national studies, programme evaluations
    - o **Bottom-up** – existing case studies of beneficiaries that already have bb + adverse impacts of not having it (exclusion)
  - = Study area specific
    - o **Top-down** – survey
    - o **Bottom-up** – case studies
  - = Sector specific evidence – farming
  - = Wider impacts – contributing to spiral of decline
- **Take up and optimisation scenarios**
  - = Importance of building in ICT business support to ensure max optimisation
    - o i.e. e-skills UK's online IT guide (currently used in Highlands of Scotland for example)

Additional benefits modelling is also possible

- **Focus on most affected industry sectors**
  - = Agriculture and farms – created more in-depth detailed case-study based impact model
  - = Tourism-visitor economy
- **Model secondary and wider impacts, of not having broadband, on the area**
  - = Business closures/ migration
  - = Population migration
  - = Falling tourism-visitor economy
  - = Spiral of isolation and decline
  - = Increased cost to public services

Communicating the results

Communicating convincing results

- Don’t exaggerate the evidence
- In-depth case studies the most compelling
- Video showing firms/households explaining in their own words the importance of broadband is very compelling
- Build into the model metrics from case studies
- Avoid overly complex ‘black-box’ models
- Show all workings and assumptions – fully audit trailed
- Undertake sensitivity, scenario and risk analysis
- Present in the form of a full formal options appraisal report

Discussion

Making the business case for Satellite

Way Forward

Discussion – way forward: 3 possible options

- **Share methodology, models, standard unit metrics**
  - = But everyone undertakes their own benefits modelling
- **Develop a pool of compelling case studies and surveys providing database of benefits**
  - = But everyone undertakes their own benefits modelling
- **Develop a shared model and results across several countries or all member states**
  - = Everyone uses this as common platform to estimate benefits and RoI