Networks and the New Economy

Networks underground – the underground economy

Franck Chevalier

9th November 2010
Ref: PC128

analysys mason

This presentation is based on public reports we produced for Ofcom and the BSG

Assessing the costs of fibre deployment

BSG Broadband Stakeholder Group

"We believe it is the most comprehensive published assessment of how much fibre deployment might cost in the UK"
(Kip Meek, Chairman)

Report available here:
http://www.broadbanduk.org/fibrecosts

The costs and capabilities of wireless and satellite technologies – 2016

BSG Broadband Stakeholder Group

The report suggests that terrestrial wireless technologies provide more cost effective solutions than fibre for about 15% of UK homes.

Report available here:
http://www.broadbanduk.org/content/view/392/7/

Operational models for shared access

Ofcom

Our work looks at the practical issues of implementing duct access in the UK supported by international case studies

Report available here:
http://stakeholders.ofcom.org.uk/consultations/wla

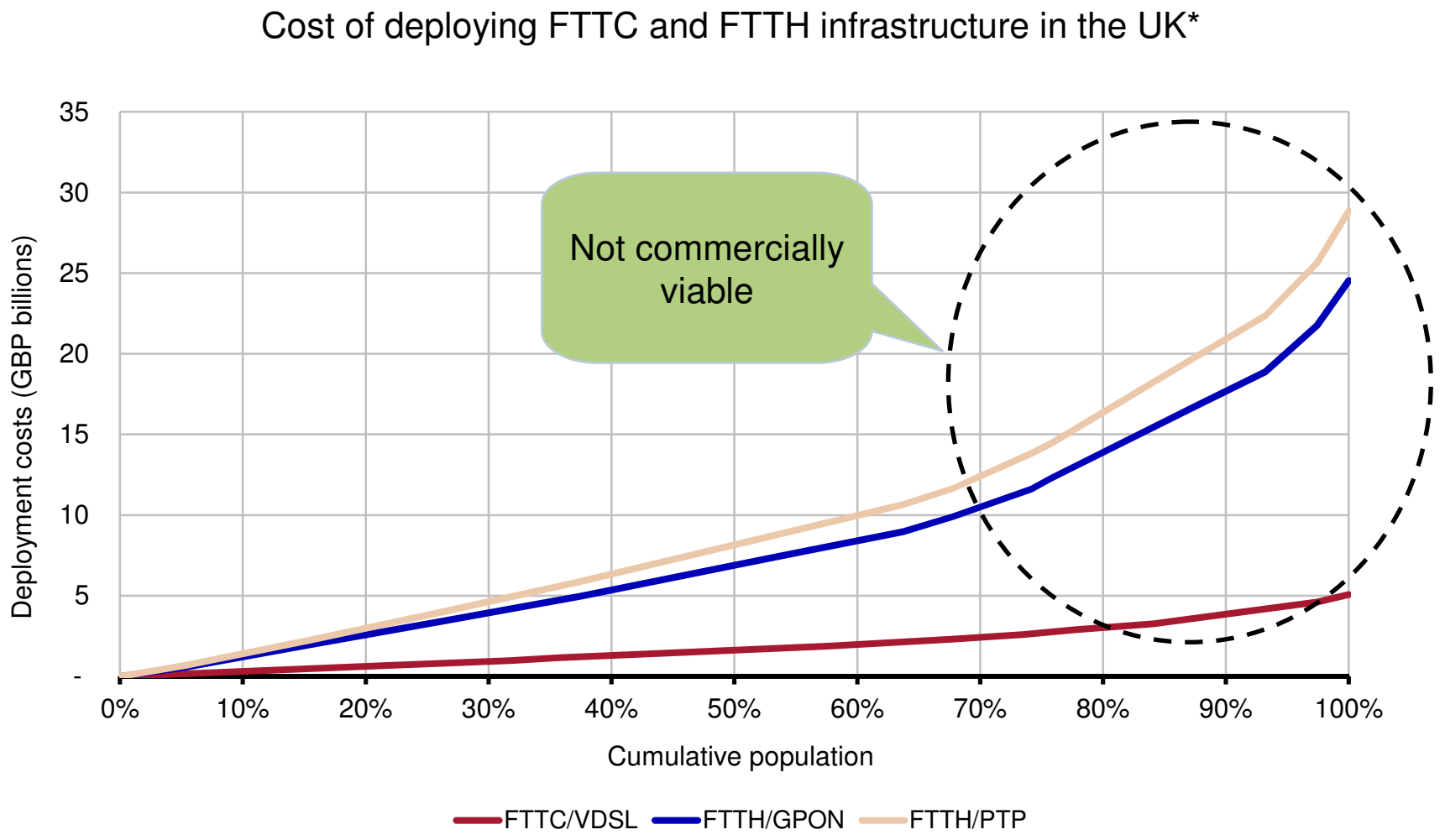
Duct access survey and NGA implications

Ofcom

Our survey of BT's duct network is an input to Ofcom's assessment of NGA infrastructure in the UK

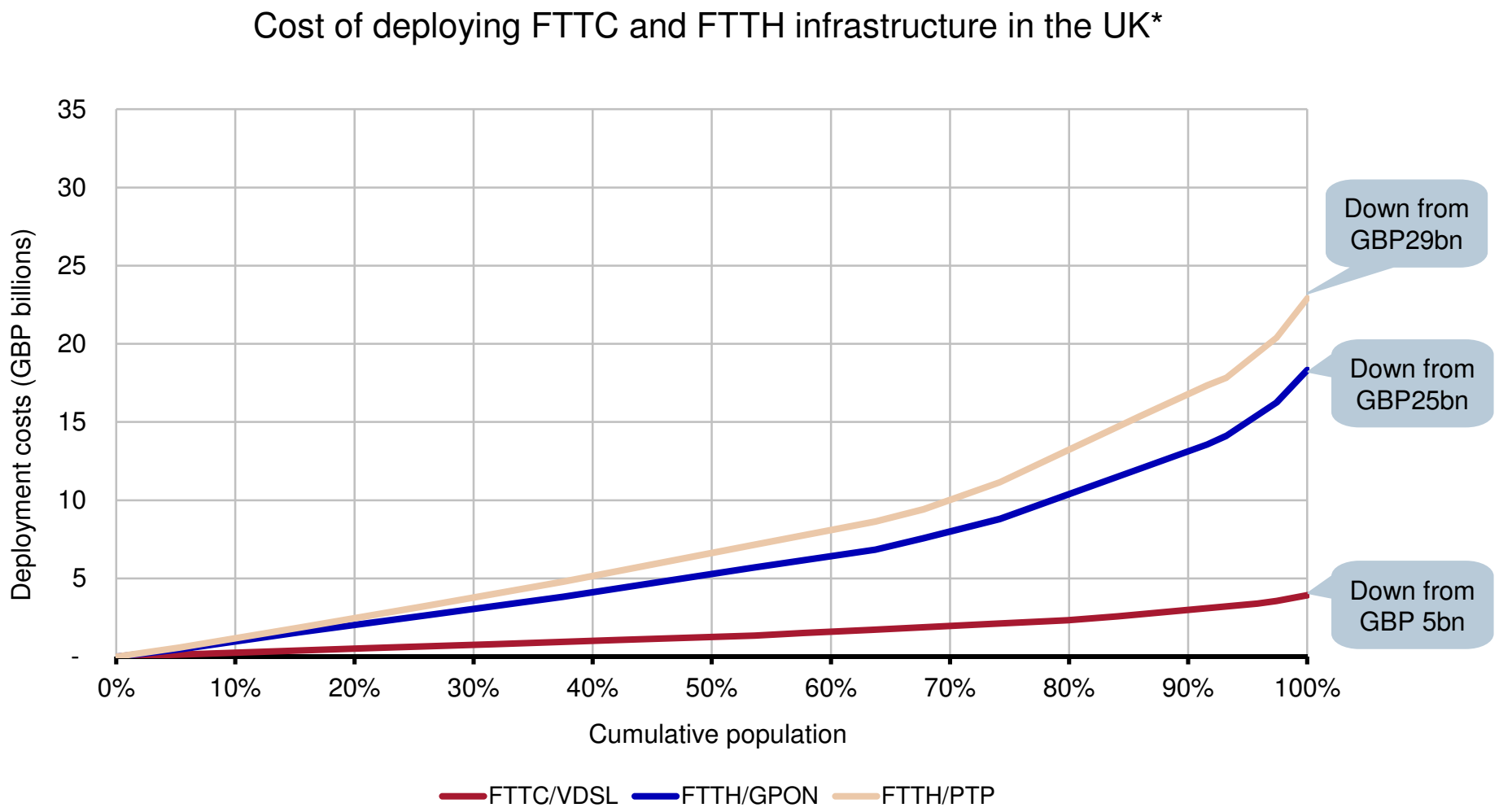
Report available here:
http://stakeholders.ofcom.org.uk/consultations/wla

The cost of delivering fixed ultra fast broadband is significantly more expensive for the last 3rd of the UK population



* assumes duct utilisation in line with BT's current infrastructure network

In areas where infrastructure exists, the re-use of underground ducts can bring substantial cost savings



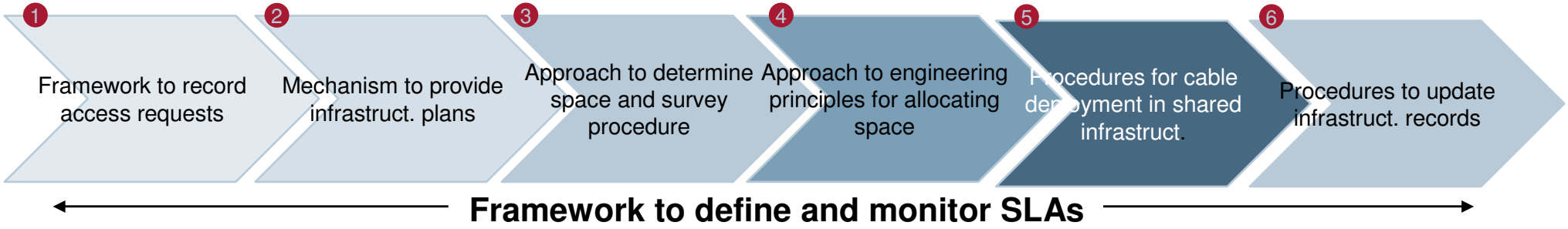
*assumes 20% higher duct utilisation than currently available in BT infrastructure network

Ofcom has concluded that BT should be required to offer access to its underground ducts and to its telegraph poles

- Following its WLA review, Ofcom has recently concluded that BT should be required to offer access to its underground ducts and to its telegraph poles
  - This would allow its competitors to roll-out super-fast broadband to areas where BT does not plan to deploy its fibre network and to target specific areas earlier than BT's roll-out.
  - The economic case for duct and pole access should improve as the market for super-fast broadband develops.

Duct and Pole access is a form of passive access where other communication providers could combine their own electronics with physical infrastructure rented from BT to deliver services.

Six steps are involved in implementing the operational framework for duct/pole access



1. is required for the communications provider (CP) to formally register its request to the infrastructure provider (IP) and track responses to that request
2. has to be implemented to enable the CP to see what infrastructure is available where
3. has to be defined to explore whether or not the infrastructure of interest has available space to accommodate new cabling
4. is required to define how the unoccupied space can be allocated to CPs to deploy their cable
5. has to be defined to dictate how new infrastructure should be deployed while mitigating the risks of damaging existing infrastructure
6. is required to ensure infrastructure plans are correctly updated

All steps should be underpinned by the definition of strict SLAs

There are three options for the access request framework, each with a different level of automation

1

- **Manual request framework with no central portal** – requests can be made by email using standard template documents (e.g. MS Word, MS Excel, other) sent by the CPs to the IP
  - ✗ Very labour intensive for both the CP and the IP
  - ✗ This does not allow CP and IP to keep track of the requests/responses
- **Semi-automated request framework using a central portal** – requests can be made through a central portal (e.g. secure website) and involve the upload of standard template documents (e.g. MS Word, MS Excel, other) to validate/complete the request
  - ✓ A central portal provides unique point of contact for both the CP and IP to keep track of request progress
  - ✗ Filling in and uploading external documents is labour intensive meaning that the process is still onerous (manual check required by the IP)
- **Fully integrated request framework using a central portal** – requests can be made through a central portal (e.g. secure website) and all necessary forms could be integrated into the portal with access via a standard web interface
  - ✓ Central portal provides unique point of contact for both the CP and IP to keep track of request progress
  - ✓ All forms filled in online with automatic conformity checking saving time for both the CP and IP
  - ✓ Infrastructure maps necessary for the CP to plan its deployment could also be integrated into the portal

analysys mason

✓ Advantage ✗ Disadvantage

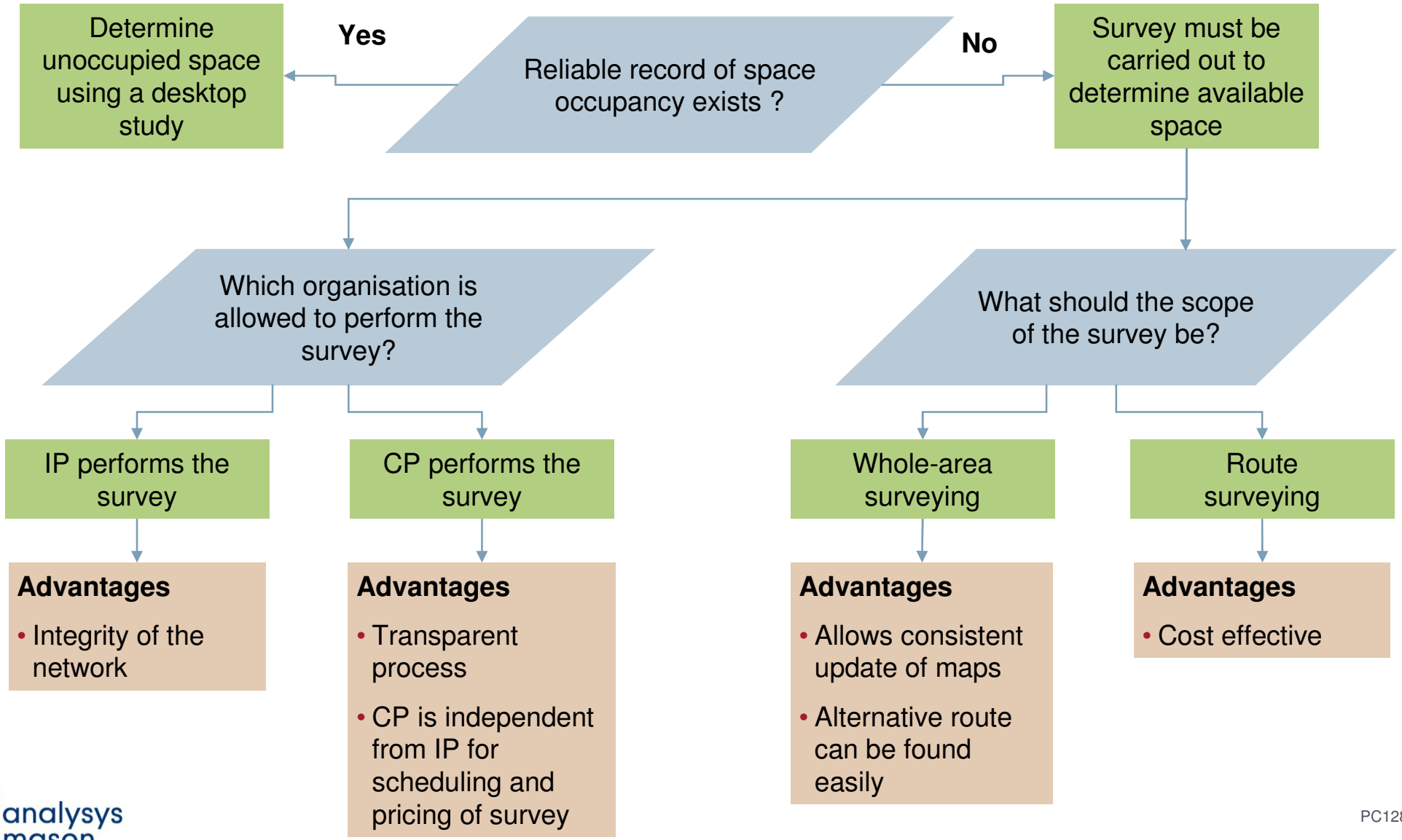
A key process is to establish a framework for the CP to access the IP's network plans

2

- Infrastructure plans can be provided in various formats:
  - paper (e.g. A3, A2 or A1)
  - static electronic (e.g. jpeg or pdf)
  - fully digitised (e.g. maps can be imported directly into GIS tool by the CP)
- The format of infrastructure plans significantly impacts the framework that can be implemented
  - **Manual infrastructure plan provision** – relevant infrastructure maps provided by the IP to the CP in the form of an email attachment, however, this would be very labour-intensive for both the CP and the IP
  - **Semi-automated plan provision** – relevant high-level infrastructure maps made available as part of the central web portal with more detailed maps uploaded by the IP on request incurring only a slight delay (e.g. a few days)
  - **Fully automated plan provision** – relevant high-level and detailed infrastructure maps available to the CP in real time as part of the central web portal. The CP could download in real-time fully digitised maps that can be directly imported into its GIS tool

The most common way to determine the existence of space in the infrastructure is through field surveys

3

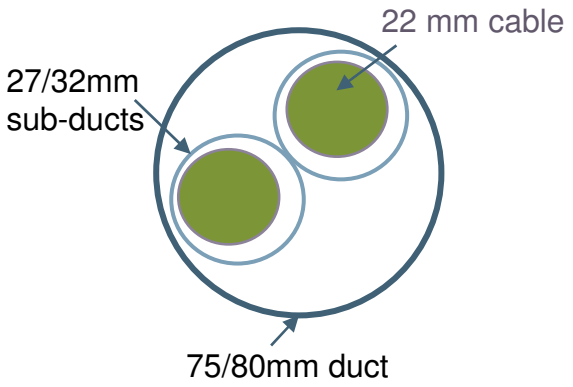


Engineering rules are challenging to implement but determine how efficiently unoccupied space can be used by CPs

4

- Engineering rules are essential to any duct/pole access process and their implementation depends upon the characteristics of the infrastructure network
- Engineering rules that meet all stakeholders' requirements are very challenging to implement
  - in France, the specification took 18 months to negotiate
- The principle of **physical separation** is central to the engineering rules:
  - separating CPs and IPs with ducts, and or sub-ducts ensures that CPs limit cable damage
  - however, physical separation does not lead to an efficient use of space
  - in part of the network where space is scarce (e.g. lead-in duct), flexible inner ducts or micro-ducts/cables may be a more space-efficient option

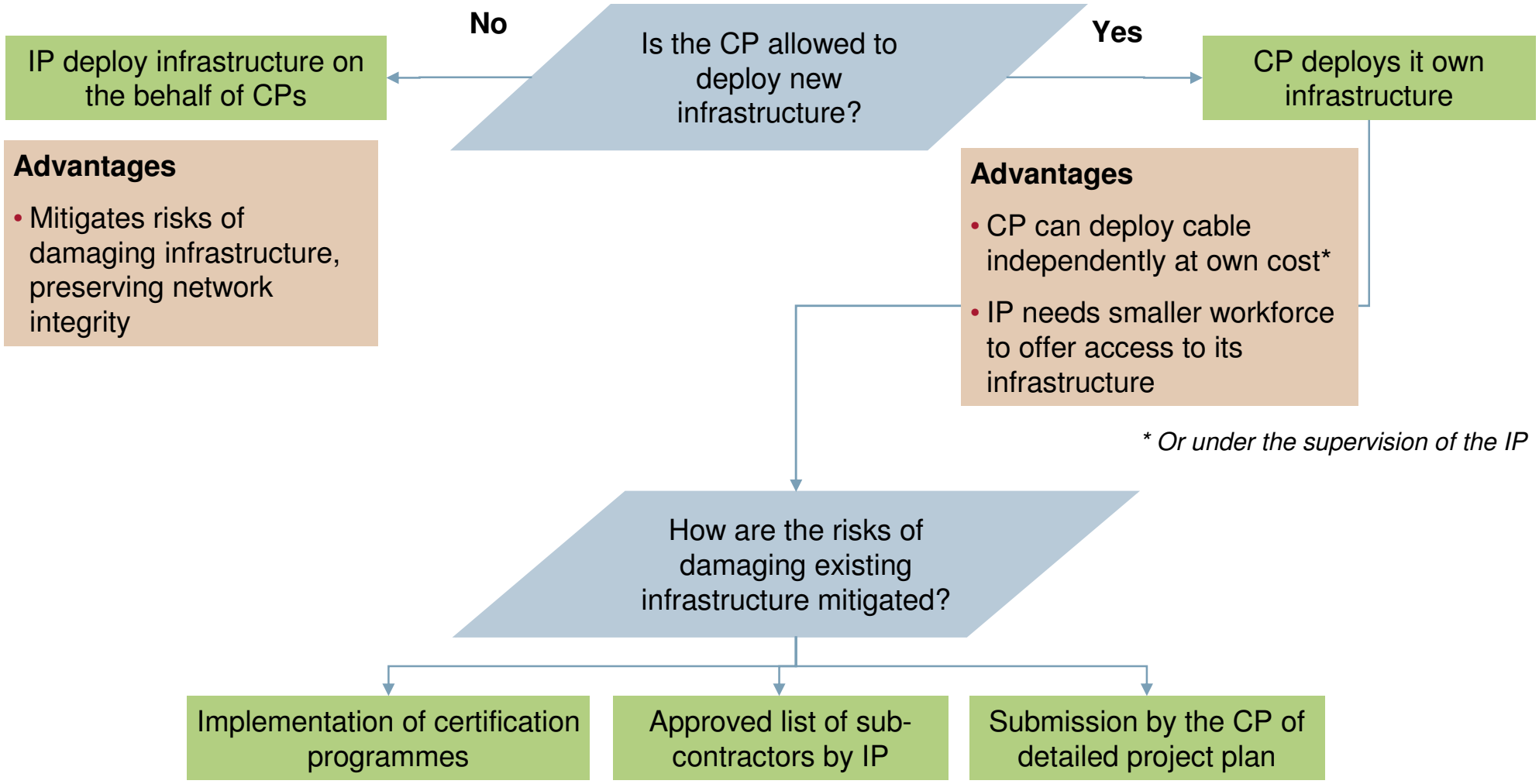
Illustration of sub-ducts in duct



Flexible inner ducts

Cable deployment is a very sensitive part of the overall process

5



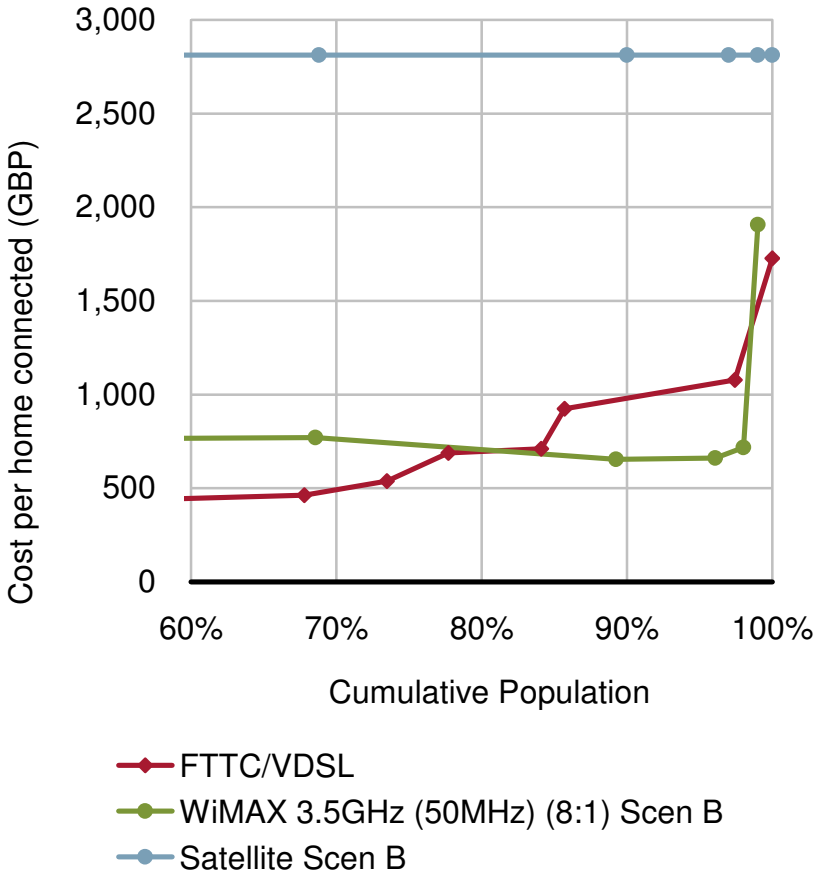
Procedures for updating network plans must be rigorous to ensure the infrastructure maps are always up to date

6

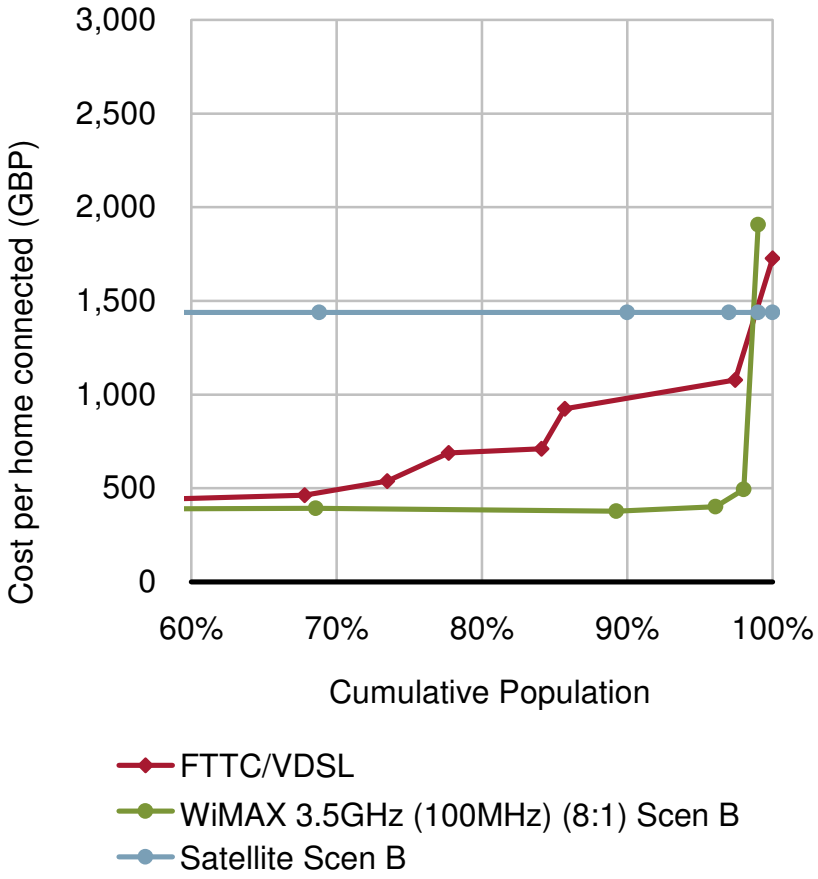
- In order for the IP to update its infrastructure plans when new sub-ducts/cables have been laid, it is important that a process is in place to allow the CP to provide its post-deployment design to the IP
- Without a suitable process in place, it will be difficult for the IP to keep track of the availability of its network
- In some countries where duct access is implemented, a new division has to be created by the IP to ensure that infrastructure plans were updated correctly

However, the scope for re-using existing infrastructure is limited in some areas and wireless provides a useful alternative

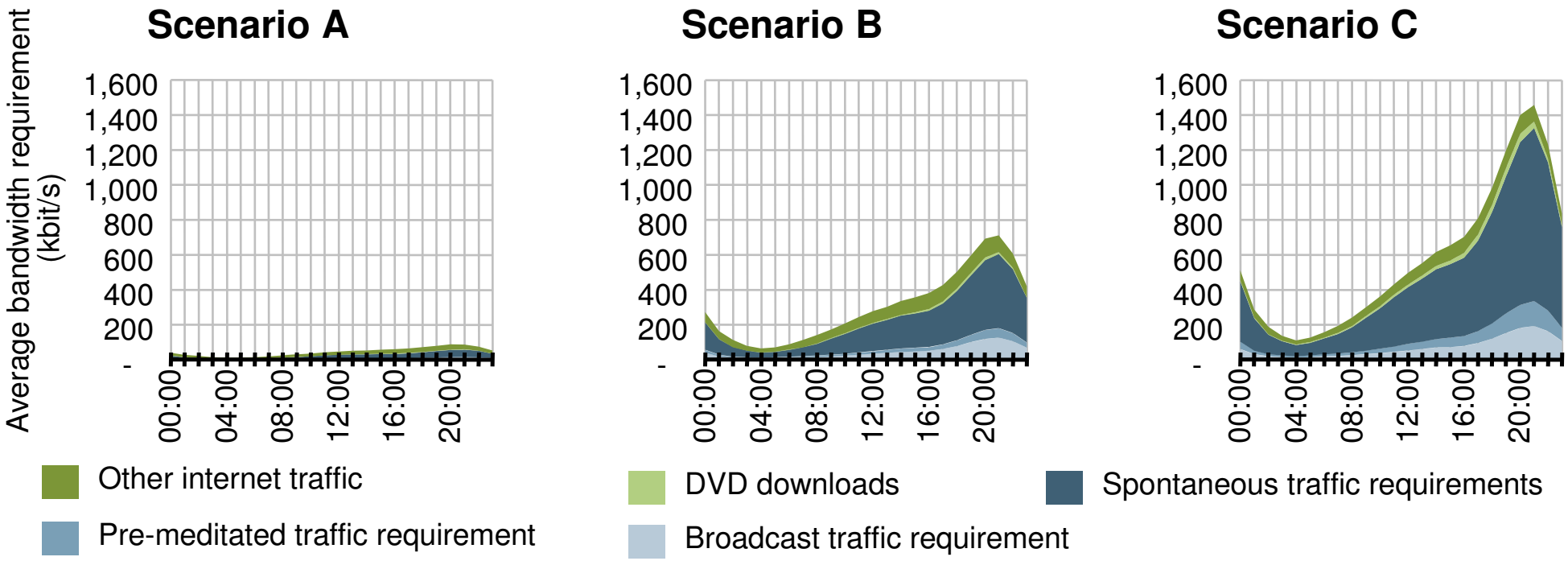
Base case spectrum assumption



Double spectrum assumption



In order to assess cost effectiveness of Wireless, we have defined 3 demand scenarios for 2016



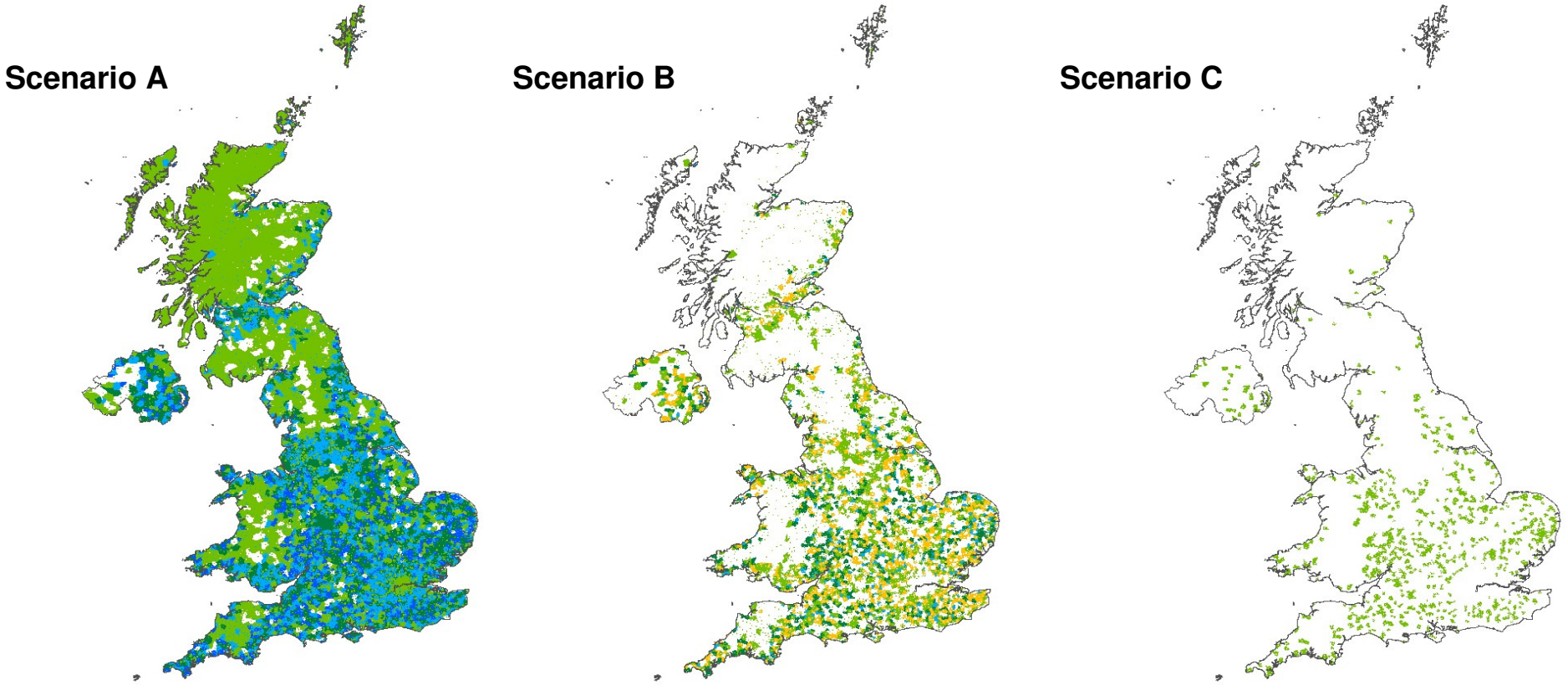
- Average busy-hour bandwidths are 85kbit/s, 711kbit/s, and 1.5Mbit/s
- Peak bandwidth is driven by multi-room streaming:
  5Mbit/s in Scenario A, 19Mbit/s in Scenarios B and C
- Assumed demand is asymmetric: upload traffic is 10% of download

analysys mason

Source: Analysys Mason for BSG

Our findings indicates that demand dictates which areas can be served more cheaply with wireless than with FTTC

Areas where wireless (TDD) is more cost effective than FTTC



analysys mason

PC128

Source: Analysys Mason for BSG

Franck Chevalier

franck.chevalier@analysysmason.com

Analysys Mason Limited

Bush House, North West Wing

Aldwych, London WC2B 4PJ, UK

Tel: +44 (0)20 7395 9000

Fax: +44 (0)20 7395 9001

www.analysysmason.com