



openreach

Openreach's 'Fibre First' Ambition

Investor & Analyst Field
Trip, Bradford and Leeds

12 October 2018

Today's Agenda

- | | |
|----------------------|---|
| 10.30 - 11.00 | Welcome and introduction to our 'Fibre First' programme |
| 11.00 - 12.00 | Tour of 'Open Street' & Bradford Training School |
| 12.00 - 12.45 | Q&A and lunch |
| 12.45 - 13.15 | Coach to Moortown exchange, Leeds |
| 13.15 - 13.45 | Overview of the build in Leeds |
| 13.45 - 14.45 | Tour of the Leeds build |



Fibre First

Upgrading up to 40 UK towns, cities and boroughs with FTTP
 Building on the largest fibre network in the UK, covering nearly 27.6 million homes and businesses

Introducing Openreach's ambitious Fibre First programme

Homes & businesses

2m

Our previous target was to make FTTP available to 2 million by the end of 2020

3m

We're now committed to build to 3m by the end of 2020/21. Upping our previous target by 50%

10m

This sets us on the right trajectory to achieve our ambition of reaching 10m with FTTP by the mid 2020s, if the conditions are right, and to reach the majority of the UK

Work already underway in **11** locations



Fibre First

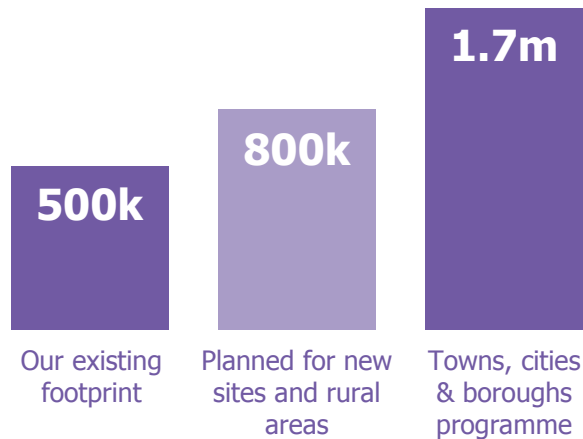
Upgrading up to 40 UK towns, cities and boroughs with FTTP

Building on the largest fibre network in the UK, covering nearly 27.6 million homes and businesses

Enablers

- ✓ Low build & connection cost
- ✓ Rapid take-up & generate incremental revenue
- ✓ Supportive regulatory & policy framework

3 million FTTP footprint breakdown*



Gfast

low cost, fast to deploy, uses existing infrastructure

Gfast still a key part of our ultrafast strategy and we'll reach 5.7m premises by the end of 2020/21

We will operate on a 'Fibre First' basis and not build FTTP and Gfast in the same location

FTTP technology is capable of at least Gigabit speeds and has an established technology roadmap



*As of February 2018

How we choose FTTP locations

Four broad steps

1 Exchange scoring model and adjustments

- Desk based exercise driven centrally
- Range of criteria used to evaluate relative attractiveness for FTTP including build cost and the competitiveness of our existing platforms

2 Front line input and commercial considerations

- Local input from operational teams
- E.g. What is the resourcing availability; what leadership can we draw on
- E.g. Local network and stakeholder knowledge

3 City selection (and contiguous exchanges)

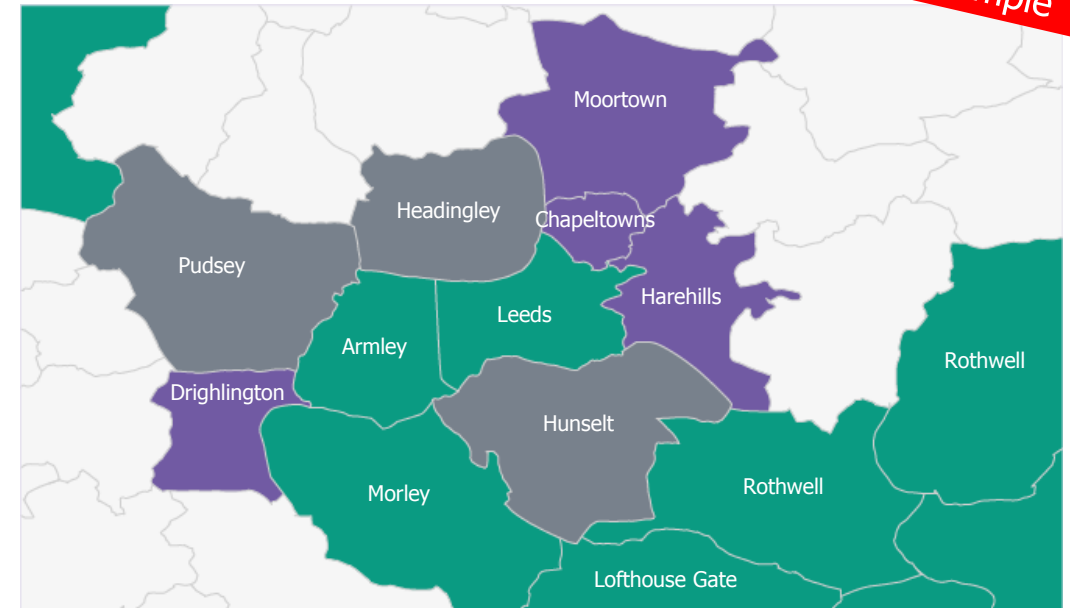
- Recommendation by strategy team
- City selection remains open until we announce - which we will do in a phased way
- Once agreed, changes may still happen within city footprints as we learn more on the ground

4 Not spot selection

- Additional work between strategy, operational and business development teams to identify not spots within selected cities that lie outside the contiguous exchanges

Leeds exchange selection

Example



Exchanges with planned FTTP only

Exchanges with planned FTTP and Gfast

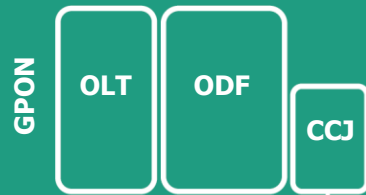
Exchanges with Gfast

Openreach Fibre Network Design

Plan & Build

Consumer Lead To Cash

Connectorised Frame
terminates spine cables for FTTP & Point to point fibre



WDM-1r passive splitter
supports co-existence of GPON, XGS-PON & NG-PON2

Universal Node
hosts FTTP splitter(s) & cross-connection fibres for Point to point services



Connectorised Block
multi-port block terminates network outside premises. Factory-fitted umbilical cable

Openreach Headend

Intermediate Joints
Allows fibres to be left close to customers for MDU / MOU Build

Aggregation Node
connects high-capacity spine to distribution cables



Fibre Capacity to support FTTC & Gfast

Business Lead To Cash

Residential NGA Products (PON)

MNO Network Requirements for 5G

Ethernet EAD Products (Pt-Pt)

The Plan & Build Process

Building a single fibre network

Intelligent Forecasting

We produce a central forecast for both FTTP and Ethernet demand in each area



Ghost Plan

The ghost plan is generated centrally based on the forecast demand



The Plan & Build Process

Building a single fibre network

Mobile Planning

Our mobile survey produces a plan that gives us a high level of confidence that we can build at low cost, comply with our planning policies and meet demand



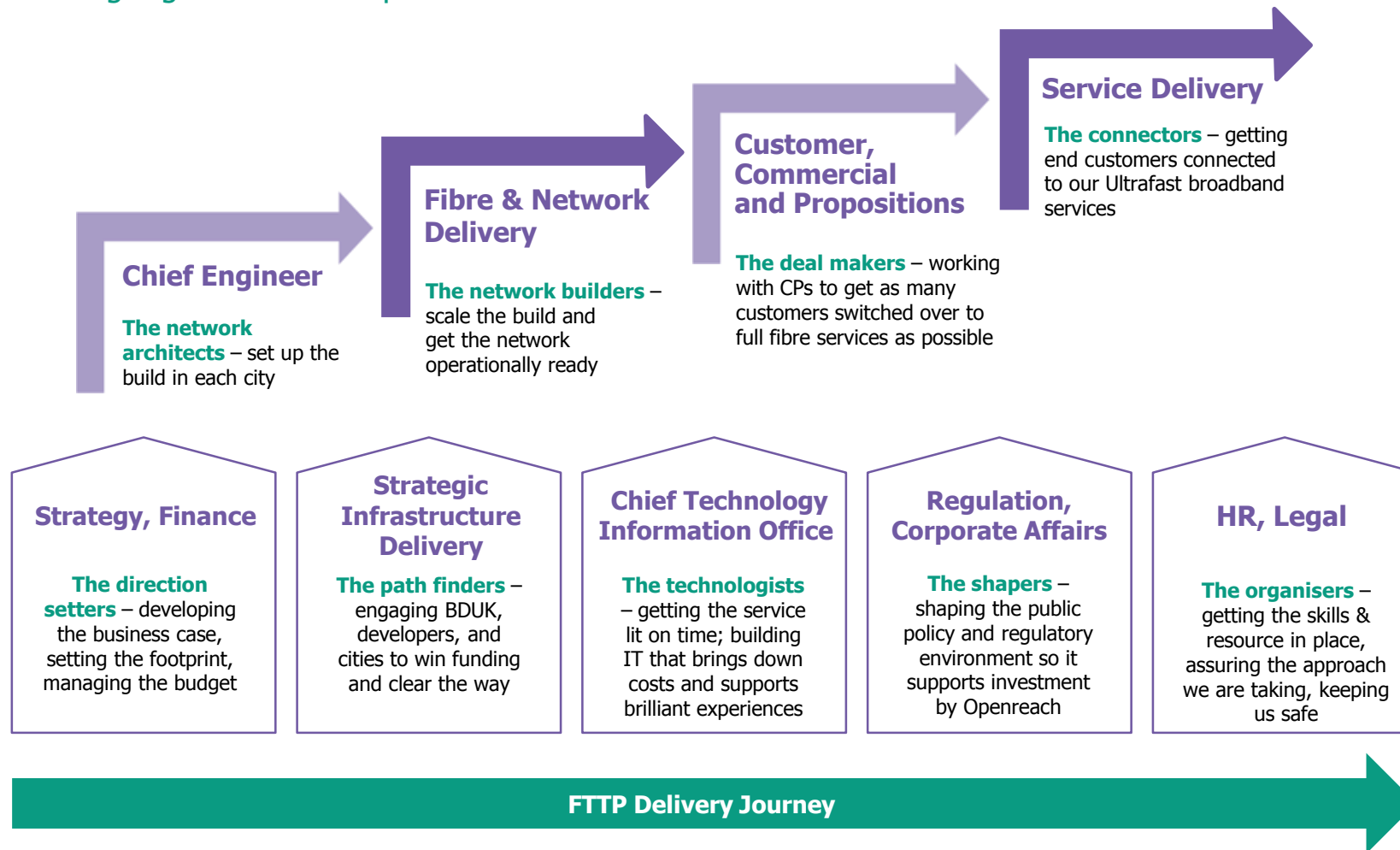
Single Fibre Plan and Build Process

The survey packs are turned into job packs for the build teams



The Openreach Fibre First Journey

Working together across Openreach to deliver



We're working with devolved government & cities to support localised connectivity ambitions



CARDIFF: Cllr Huw Thomas, City Council Leader

"I'm delighted that Cardiff has been selected as one of the first UK cities to benefit from Openreach's 'Fibre First' programme"



BRISTOL: Cllr Craig Cheney, Deputy Mayor

"It is great to be a part of this announcement...Bristol has a great reputation for being at the forefront of technology with our strong local industry"



MANCHESTER: Andy Burnham, Greater Manchester Mayor

"Our ambition is for Greater Manchester to be the UK's digital capital"

Unrivalled people power



- UK's **largest team of telecoms experts**
- **31,000 people**, including 25,000 field engineers
- 2,392 engineers hired in 2017/18 and now our **largest recruitment drive ever** - 3,500 more joining this year (recently made our 3,000th job offer)
- UK's **largest & most advanced fibre training facilities**: 12 new/upgraded regional schools
- **Record levels of training**: 150,000 training days in 2018, more than double the 2014 level
- **New, improved trainee scheme** linked to a NVQ
- **Huge rise** in employee engagement metrics – 75% engagement outcome, increased by 15% in 18 months

Scaling fibre build for Openreach and the nation

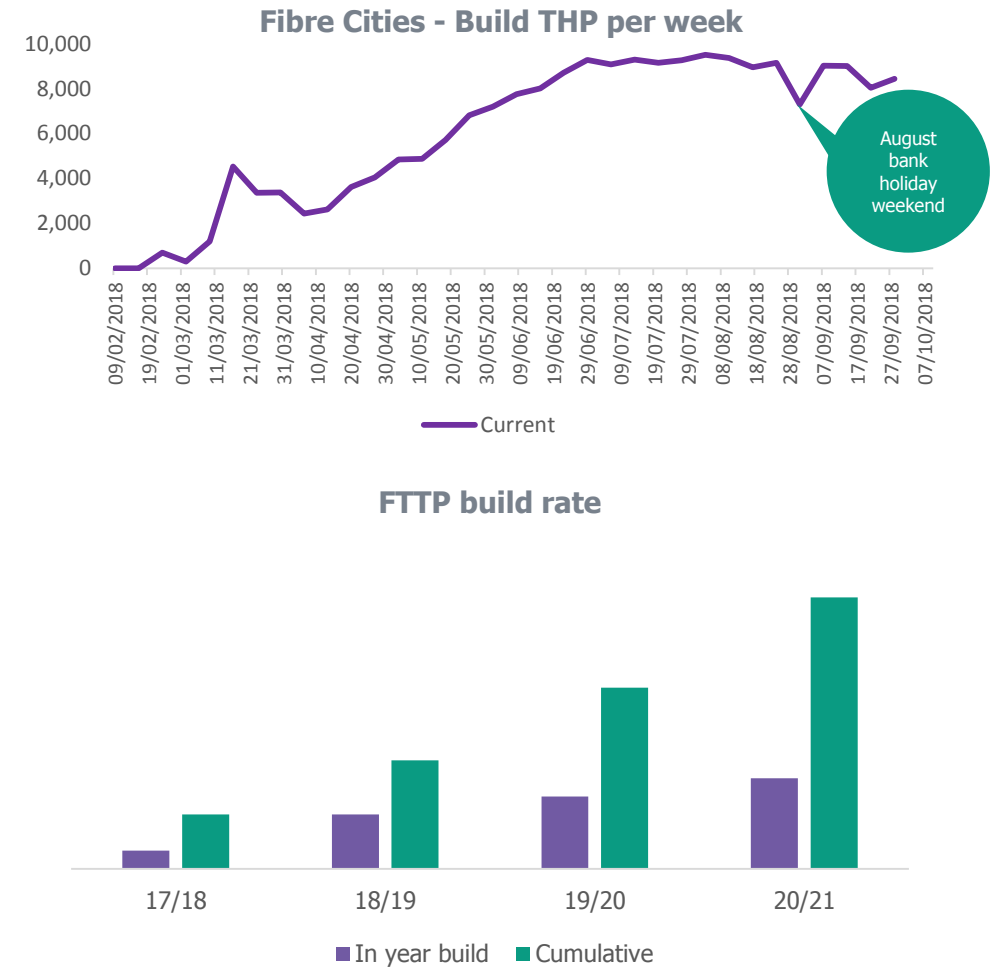
We're building at scale, pace and at the right quality

We built more FTTP in 2017/18 than we have built in any previous year, and we'll do the same again this year

We've reached a build rate of 13k FTTP a week across the three major programmes (New Homes, BDUK and Fibre Cities)

This year we will build to over 600k premises, more than in all of the last 7 years

Putting us well on track to reach our 3m commitment by end of 2020/21



Scaling beyond 3m – key considerations

To accelerate the build, we need to prove key enablers are in place and we're making good progress

	What do we need to prove and get clarity on?	How are we doing?
Operational	<ul style="list-style-type: none"> We can build at the right cost points We can connect premises at the right cost points We can scale within and across cities 	<ul style="list-style-type: none"> Building at the lower end of the estimated build cost range Ramped up quickly across cities, expanding to new areas Deliberately targeting easier and lower cost premises first
Commercial	<ul style="list-style-type: none"> We can get all of our large CPs onto the FTTP platform We can sell at the price points we need We can secure deals to achieve mass adoption 	<ul style="list-style-type: none"> Long-term volume deals are driving CPs onto FTTP FTTP build in copper not-spots largely underpinned by WLA Need to secure deals on FTTP where we are overbuilding FTTC
Regulation & public policy	<ul style="list-style-type: none"> Clarity on the terms of the fair bet Agree fair treatment of 'legacy' assets providing recovery for potentially stranded copper and FTTC Agree a balanced approach to copper retirement Reduce red tape around wayleaves Reform cumulo rates 	<ul style="list-style-type: none"> DCMS Future Telecoms Infrastructure Review and Ofcom's Full Fibre Implementation Plan suggest supportive moves/ agreement on key principles for investment Regular engagement with Ofcom and Government Reform of Cumulo and isolating FTTP regime is complex

Glossary

Aggregation Node	Usually found in a footway box, these collect together fibres from multiple branches in the street before they make their way to the spine
BDUK	Broadband Delivery UK – the government’s broadband subsidy programme for rural areas
CBT	Connectorised Block Terminals - fully sealed, plug and play blocks with downward facing ports to protect fibre connections from the weather and dirt
CCJ	Cable Chamber Joint
CPs	Communications Providers
DSLAM	Digital Subscriber Line Access Multiplexer – our fibre street cabinets used to provide superfast broadband
EAD	Ethernet Access Direct – a point-to-point Ethernet Service
Ethernet	Dedicated point-to-point fibre business circuits
FTTC	Fibre-to-the-Cabinet
FTTP	Fibre-to-the-Premises
Gfast	Attached to our cabinets, this kit delivers ultrafast broadband speeds over our existing network
Ghost Plan	Our indicative digital network build plan

Headend	Exchange equipment which manages the data transmitted over our fibre cables
MDU	Multiple Dwelling Unit (e.g. an apartment block)
MNO	Mobile Network Operator
MOU	Multiple Occupancy Unit
ODF	Optical Distribution Frames are ‘plug and play’ exchange equipment which connect fibre lines
OLT	Optical Line Termination
PON	Passive Optical Network
Splitter	Splits the fibre connection to serve multiple premises
Superfast	Speeds greater than 30 Megabits per second
THP	Total Homes Passed – the number of premises that can order a fibre services
Ultrafast	Speeds greater than 100 Megabits per second
WDM	Wavelength Division Multiplexing allows multiple signals to be carried over a single fibre cable

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