Department for Culture Media & Sport

Emerging Findings from the BDUK Market Test Pilots

Annex B:

Technologies being tested in the Pilots

February 2016

Supplier	Technology	Strengths	Limitations	Innovations being tested
Call Flow	FTTC Sub-loop unbundling (SLU)	Established BT products Cost effective	Not effective for premises beyond ~1.85km from the cabinet and Exchange Only lines	Proof-of-concept trial with BT to test new SLU products that allow a CP to unbundle the copper beyond the cabinet
Call Flow	Wireless - GBit radio links - 71-76 GHz and 81-86 GHz (licensed E Band) - line of sight	Very high capacity, reliable, low power. Deployed quickly on <15m poles under relaxed planning rules.	Much more suited to 15m lattice towers, but these can not be deployed under the current relaxed planning rules	Using fibre-fed Gbit radio sites to help connect in islands of NGA white premises to the core network
Call Flow Cybermoor	Wireless - FWA 5.4 GHz (licence exempt) & 5.8 GHz (lightly licensed) spectrum	Deployed quickly on <15m poles under relaxed planning rules.	Requires line of sight or near line of sight and is not suitable for areas with dense tree cover Cost premises is high for small clusters of premises	n/a
Call Flow	New fibre build using PIA in BT ducts and on poles	Established BT products Low capex	Higher opex Availability of suitable existing infrastructure Cost is location dependent and highly variable because of the condition of ducts	Using the newly released database of BT pole locations. Beyond the Pilot timeframe the implementation of the EU BB cost reduction direction will provide further infra sharing opps.
Call Flow Cybermoor	New fibre build using new direct buried duct	Low opex Long asset life Opportunities for capex savings (see section on cost reduction)	High capex Dependent on obtaining wayleaves/easements (private land) or availability of suitable Highways verges	Various mole ploughing and trenching techniques
Quickline	Wireless - line of sight 5.4 and 5.7 GHz	Very effective for target postcode density, spanning large areas with relatively few subscribers	Each premise ideally covered by two transmitters in different directions, increasing chances of having LoS to at least one. LoS cannot always be proven prior to installation	Modulation per subscriber, delivering optimum throughput rather than lowest common denominator. GPS synchronisation to eliminate self-interference
Quickline	Wireless - near line of sight 5.4 and 5.8 GHz	Tree tops cause minimal degradation with as much as the entire lower lobe of the Fresnel zone obstructed	Alignment of 28 dBi antennas must be very precise, increasing the difficulty of installation	High gain 28 dBi grid antennas to receive highly attenuated signals
Quickline	Non line of sight 2.4, 5.4 and 5.8 GHz	Similar performance to LoS but only at distances of less than 1.5 km	Most obstructions in rural areas are absorbent surfaces rather than reflective	Multipath reflections using 2x2 MIMO technology

Quickline	Point-to-point and point-to - multipoint links 80 GHz band	High capacity (1-2 Gbps) and adaptive modulation. Quick to deploy	Noticeable rain fade, and limited range at full capacity.	E-band millimetre waves
Satellite Internet	Satellite as backhaul	Quick to deploy, higher capex spread over more users.	Contention at the head end ultimately limits the commercial model. Single point of failure.	Hybrid approach of satellite backhaul and fixed wireless distribution.
Satellite Internet	Either wireless distribution or direct to home satellite	Flexibility in technology deployment to minimise deployment costs.	Different technology has different impact and hence reaction from consumers.	The same packages, pricing and service levels regardless of technology.
Avanti	Superfast satellite	Demonstrates that Satellite is more than a basic broadband technology.	Still not classed as NGA because of data caps / pricing regime, upgrade costs and ultimate limitations on speeds.	Superfast speeds in excess of 30Mbps delivered over a satellite broadband connection.
Airwave	Wireless - FWA 5.4 GHz & 5.8 GHz spectrum	Very effective for target postcode density, spanning large areas with relatively few subscribers	The key limiting factor is the requirement for LoS between the consumer premises and the network access point and the power limitations of the spectrum.	Capable of meeting NGA requirements
Airwave	Wireless - Microwave links 7GHz, 5GHz and 24GHz spectrum	This link is upgradable which is assessed to be more than sufficient to provide NGA capable services to the target premises. In addition the use of this link minimises capex and opex costs by way of a separate management circuit.	The solution required LoS	n/a