Fibre to the Premise FTTP (Sometimes fibre to the home - FTTH)

This document explains the background, work and components for - and a means for estimating the costs of - bringing fibre-optic broadband directly to the premises.

Background

Tove Valley Broadband (TVB) runs a service where the infrastructure has been partly funded with public money (£108,000) from the Rural Communities Broadband Fund (RCBF) and which aims to deliver better than 30Mbps to any premise within our intervention area - the area of postcodes nominated by Broadband Development UK (BDUK) and administered by DEFRA. This service has fibre-optical connections to each village Points-of-Presence (PoPs) which feed radio access points. Premises are connected by radio to these access points.

TVB has a symmetrical (that is, download and upload speeds are the same) 1,000Mbps service running into Wappenham Church. This service is connected directly to a router in Telehouse East and it is a mere 2 hops away from international internet lines.
There is then a fibre-optic network joining the church to other villages. The circuitry uses Gigabit Passive Optical Network (GPON) technology which has been chosen to provide a cost effective and easy for the community to handle fibre-optic service to premises. These circuits run at 2,500Mbps.
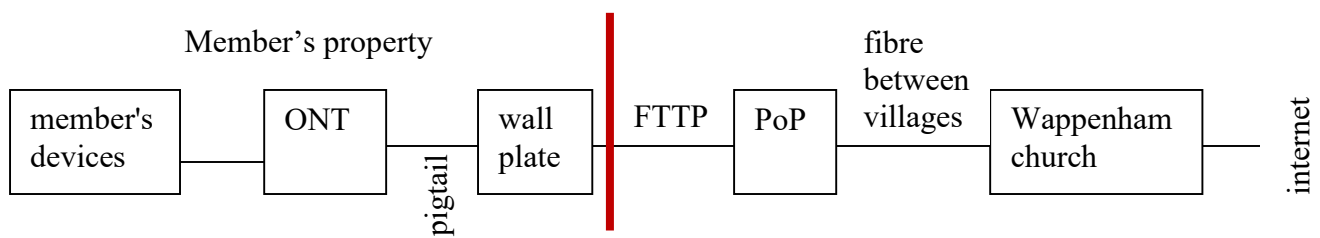The PoPs in each village are:

Abthorpe	A termination on the boundary between Philip Berry and Mary Hulbert's land north of the Village Green
Bradden	A termination at a point where the footpath skirting the south side of the village crosses between Mark Parry's and Barwell Estate's land.
Lois Weedon	A termination opposite the school on Ashwell Road.
Slapton	Near The Fellyard
Wappenham	A termination point in Robert Tomkinson's yard next to the playground; also outside the church gate.
Weston	A termination point near the fence between George Sitwell's paddock occupied by Andy Seccington and the garden of the Kilgallon's Stonehouse Barn

This is not an exhaustive list - there are other possibilities in certain circumstances.

A map of the actual route of the fibre between villages can be found *here*.

What is needed to bring FTTP?

In the property, a ethernet-to-fibre Optical Network Terminator (ONT) is required so that the owner's devices might link via ethernet or WiFi to the fibre network. To use FTTP to the full, all your devices must be gigabit (1,000Mbps) capable.	Simple ONT - £90 (you get an ethernet port) WiFi router, 4-way switch and VOIP terminations - £190
The ONT device is usually connected to a wall plate by a "pigtail" fibre cable. No power is required here. The wall plate houses the termination of the fibre-optic cable which runs outside the premises and back to the village PoP	£15
The FTTP connection will usually be an 8mm diameter black tube containing a 3mm fibre-optic cable. This can be tacked along fences, buried or even strung in the air.	Tube, fastenings and fibre cost about £1.50 per metre.
Between the premises and the PoP or at the Pop there will be a splitter - a non-powered (passive) unit. The housing for this unit is generally a dome mounted in a manhole or on a wall/fencepost. This will be shared by up to 8 properties.	Estimating the cost of burying tubes and cables, constructing manholes, etc. is difficult but some guidance can be sought from the experience from **Abthorpe – NE fibre** below.
The PoP is joined to Wappenham - part of the basic infrastructure of TVB	

Within these guidelines there are several areas where the individual location will have a bearing on the costs and it is imperative that the requirements - location, position on the premises, possible route to the premises - are assessed by the TVB team in order to give an accurate cost for FTTP service.

The following is a breakdown of the **Abthorpe – NE fibre** now delivering FTTP to 7 houses:

From the PoP on the boundary between Berry/Hulbert a 12-core loose tube armoured cable (about 10mm diam) was buried in a trench between 18" and 36" depth leading to (in one length about 300m) a new manhole dug in the paddock to The Barn (Paul Grimes). Over the cable is a green plastic tape to warn anyone digging that there is a cable below. From this new manhole, a further 14mm white/blue tube with a 12-core bundle of fibres was buried around to the garage at 2 Wappenahm Road (Eric Malcomson).
Making use of the same trenches, 2 single fibres in 14mm white/blue tube was run to No 4 and No 6 Wappenham Road and a 14mm tube with a single fibre runs to Leeson House.
2 single fibres have been placed in conduit tubing along the fence of No 10 to serve No 8 (not commissioned) and No 10.

A 14mm white/blue tube was trenched to serve The Stone Barn (Paul Grimes) with a single-core fibre and a 14mm white/blue tube containing a 12-core bundle of fibres runs into No 12 garden and to a dome enclosure on the west wall. 8mm tubes run from here to service No 12 (John Riches) and (future) other properties in the area.

The work was carried out by 2 Members who hired a trencher and a mini-digger for 1 week and fibre splicing was undertaken by FibreOptions; terminations by Members.

Not counting the ONT cost, each member connected shared the connection costs of £600. The main cable, manhole and 12-core connections cost £2,000 (including hire of equipment) and costs were allocated to TVB infrastructure. This was approved by the Directors in view of the distinct possibility of taking these lines to the south of Abthorpe serving Wappenham Road (S) and Brackley Lane (E).

For a simple ONT conversion to ethernet, members paid £212; for a full WiFi/VOIP termination, members paid £276.