

Case Study  
CableFree Last-Mile for Telecom Carriers  
Wireless using in Telecom Networks



CableFree Microwave links used in Last Mile applications in the Middle East

### About Wireless Excellence

Founded in 1996 and with headquarters in Oxford UK, Wireless Excellence Limited is a leading designer and supplier of outdoor and indoor Broadband Wireless communication products.

With a complete range of solutions including Radio, Microwave, Millimeter-Wave, Free Space Optics, WiFi and 4G/5G/LTE, customers in over 80 countries have chosen Wireless Excellence as the “one stop shop” solution of choice for dependable wireless networking.

## CableFree Last-Mile for Telecom Carriers

CableFree wireless links are used extensively by telecom operators to provide last-mile connections in locations where traditional leased-line and fibre-optic links are impractical.

Though telecommunication operators have made huge investment in fixed infrastructure, providing long-distance and metro rings in urban and industrial areas with voice, data and video services connected usually from a backbone SDH fibre network using copper, fibre or wireless technologies.

Cable digging, increasingly unpopular in cities, is regulated by the local authority who may restrict re-digging frequency of roads – and the cost may be prohibitive in any case, especially if a river or railway is in the way.

Typical PDH connection using copper telephone wires provide 1.5 or 2Mbps access per pair – traditional access solutions ‘multiply’ capacity using parallel circuits to provide 4x2 (8Mbps) or 16x2 (32Mbps) throughput. However, these are ‘slow’ compared to modern network demands of Ethernet at 10/100Mbps or ATM services at 155 or 622Mbps.

Cable Modems and xDSL (8Mbps maximum) are often not reliable on all installations, depending on the age and condition of the copper cables. ‘Availability’ of xDSL connections is typically low, limited also by DSLAM and other network equipment and back-haul.

Though operators make optimal use from long-distance and metro fibre rings, last-mile links only carry traffic for a single user or building – making return-on-investment problematic. Not only is the cost of digging in fibre in urban areas is high, but end-user loyalty or long-term commitment is never certain. ROI from fibre depends on long-term amortisation of assets from long-term customer income, which cannot always be guaranteed.

By comparison wireless links can be removed when the customer moves, and redeployed elsewhere, thus preserving capital investment in equipment.

### Flexible Deployment

CableFree wireless links can be located on walls, towers, masts and even behind windows, to give maximum flexibility of deployment. In case of customer relocation, wireless equipment can be redeployed on new sites without loss of investment.

For temporary deployment, wireless links can be mounted on tripods either on buildings or vehicles. An ideal application is ‘disaster recovery’ when wireless equipment can be driven to a site where there is a ‘fibre cut’ and deployed to restore communications immediately.

CableFree’s wireless solutions occupy small ‘footprint’ and do not cause objection on grounds of aesthetics.

Historically, wireless has often been considered ‘suspect’ choice of technology by telecom carriers, with often-cited problems of beam alignment and performance in adverse weather such as rain or thick fog.

CableFree has reversed a ‘low performance’ trend by developing novel technologies and products designed for rugged and harsh environments.

Wide-beam optics ensure stability against building movement, vibration, wind loading and tower/mast sway. Where other vendors are constrained to use narrow beams by lower output powers, CableFree pioneered the use of eyesafe Class1M high-power transmitters, enabling wider beam divergences and hence stability against movement.



**Last-mile application for China Unicom in Tibet. Shown here is a repeater site to provide non-line-of-sight connection from fibre ring to end-user site. Potala palace features in background.**



**Installation of CableFree Microwave Link takes a few hours, compared to days or weeks for cable/fibre digs.**



**CableFree UNITY installation in London, combines FSO + MIMO Radio for Resilient, Diverse Media, 1+1, zero single point of failure, ultra-high-availability networking**

High link margin by use of quality optics and ultra-sensitive enhanced receivers give 10-20dB advantage over competing solutions.

Unique to CableFree, Automatic Transmit Power Control (ATPC) reduces transmit power in clear conditions and increases in high-fade, with 16x (12dB) dynamic range – another 12dB improvement on older, competing solutions.

As part of professional services, CableFree has developed extensive Link Engineering tools, using a global weather database of 2,700 cities, to provide accurate prediction of link availabilities for all of the world's major cities. For other users, CableFree has access to local higher-resolution metrological data, to predict the 'four nines' and 'five nines' distances for required locations.

## CableFree UNITY: Ultimate Wireless Technology

CableFree has pioneered UNITY solutions which combine diverse media into a single hybrid link. By combining different media and technologies such as FSO+Radio, FSO+MMW, MMW+Microwave, composite UNITY links can extend range, capacity, availability and give operators confidence in connectivity at all times to end customers. UNITY ensures that there is no single form of failure or downtime. For example, an FSO link that inherently suffers in fog would have microwave or radio resilience, which do not suffer in fog. Weather patterns ensure that it is never foggy whilst raining, and vice versa. Whilst both paths are up, capacity is doubled. Useful range is extended up to the maximum of each technology. As there are two complete, separate paths, there is no single point of failure, including LOS (Line of Sight), Power, Cabling, Equipment.

## Summary

Wireless Excellence's diverse range of CableFree wireless solutions have been deployed in over 80 countries and with some of the world's major telecom carriers including Cable & Wireless, China Unicom, Vodafone, Nextel and Orange. With latest generation wireless technology plus professional planning tools, reliability is high and customer satisfaction assured.

## Recommended Products

CableFree MW	Licensed Microwave links up to 6Gbps, range up to 100km
CableFree MMW	60/70GHz Millimeter Wave links up to 10Gbps-40Gbps, range up to 10km
CableFree Access FSO	FSO Connectivity up to 155Mbps, range up to 4km
CableFree Gigabit FSO	FSO Gigabit Ethernet and Fibre Channel up to 1.5km
CableFree AC-MIMO	Radio links up to 550Mbps, range up to 40km

## For More Information

Please contact Wireless Excellence Ltd for information on the complete range of CableFree products and services



**CableFree FSO deployed in Hunan Province, China. Industrial smog produces high attenuation which limits transmission distances to 1km. Sophisticated planning tools are used to predict link availability. CableFree UNITY solutions use diverse media (FSO+radio, FSO+MMW, MMW+Microwave) to extend range, capacity and availability by combining different wireless technologies**

T: +44 (0)870 495 9169  
E: sales@cablefree.net  
W: www.cablefree.net

Wireless Excellence Limited  
The Oxford Science Park,  
G6, Magdalen Centre  
Robert Robinson Avenue,  
Oxford OX4 4GA