

CONNECTIVITY REPORT



Reading, RG1 1JG

Telecommunications Connectivity

Fixed Network and Mobile Coverage Assessment

9 Greyfriars
 Greyfriars Road
 Reading
 Berkshire
 RG1 1JG

ewave

telecommunications rating

Fixed Network Services

BT Services	Excellent
Other Carriers	Good

Mobile Network Services

Operator	Voice	Data
Three	Good	Good
Vodafone	Good	Good
O2	Good	Good
EE	Good	Good



Fixed Network Connectivity - Carrier Study

9 Greyfriars, Greyfriars Road, Reading, Berkshire RG1 1 JG

STRUCTURE

9 Greyfriars is a commercial office property located in the centre of Reading town centre. The building is in the final stages of a comprehensive refurbishment extending to four floors affording approximately 39,926 sq ft (3,710 sqm) of Grade A office accommodation over open floor plates with suspended ceilings and raised floors throughout. The building is of typical steel frame and concrete floor construction with fully glazed facades to all elevations located within an environment of other commercial properties of varying sizes and heights with good separation between adjacent buildings.

TOPOGRAPHY

Location Plan

CGI

BT Exchange locations
Routes and distances are indicative only

BT Exchange Information

Primary Exchange (500m approx)	READING CENTRAL (THRG) RG1 2JB
Secondary Exchange (1,400m approx)	CAVERSHAM 9THCV) RG4 8AZ

BT SUMMARY

9 Greyfriars is located approximately 500m from the BT Reading Central Exchange which is situated to the south east of the building. Reading Central Exchange provides excellent services including ADSL, ADSL+, 21CN WBC and FTTC (to some areas) plus the availability of LLU services from C&W, Talk Talk, Sky and Zen Internet all over BT infrastructure. Based on the existing standard copper services, it can offer broadband speeds of around 15-17Mbps at this time. This exchange has been enabled to provide BT Infinity services over fibre with speeds of up to 80Mbps download and 20Mbps upload but is currently not showing availability of these services to this location (Data via the BT website). Caversham Exchange to the north west affords a similar level of services and could provide a level of diversity and resilience across BT business services should it be required.

TELECOMS CARRIERS

Telecommunications carriers with owned infrastructure located adjacent to the building are listed below for information. In addition to these, there are a number of alternative carriers that can provide service, albeit over a third party network such as BT. It must be noted that the presence of infrastructure within the search area does not constitute availability of service.

British Telecom Tel: 0800 800 152 www.bt.com
Virgin Media Tel: 0800 953 0180 www.virginmedia.com
Vodafone Tel: 020 7111 0047 www.vodafone.co.uk
Level 3 Tel: 020 7954 5454 www.level3.com
City Fibre Tel: 0845 293 0774 www.cityfibre.com

SUMMARY

The BT copper and fibre services available at Reading Central Exchange, and added resilience of a second exchange afford 9 Greyfriars an excellent level of services to meet today's business needs, with the added advantage of good diversity and resilience opportunities. The physical presence of alternative carriers infrastructure to BT from Virgin Media, Vodafone, Level 3 and City Fibre adjacent to the building and in the local environs affords a good choice of alternative carrier to provide fibre services to any incoming tenant.

RATING	1 Low (Copper only)	OTHERS	1 None (No alternative carriers adjacent to site)
BT	2 Fair (Copper internal, fibre external)	OTHERS	2 Fair (Carrier services in local environs)
OTHERS	3 Good (Copper / Fibre internally)	OTHERS	3 Good (Carrier services adjacent to building/site)
	4 Excellent (Copper/Fibre internally) with diversity	OTHERS	4 Excellent (Carrier services in building/site)

GLOSSARY OF TERMS

ADSL (Asymmetric Digital Subscriber Line) Asymmetric line speed, the speed from the internet to the user, and the user to the internet are different. Feed over copper cable, governed by distance from exchange to user. (co-exists with voice services)

ADSL+ (Asymmetric Digital Subscriber Line+) Asymmetric line speed as above, but with faster connections both downstream and upstream over similar distance following roll-out of BT's 21CN Wholesale Broadband Connect (WBC).

SDSL (Symmetric Digital Subscriber Line) Symmetric line speed, the speed between the user and the internet are the same in both directions but cannot co-exist with voice services over the same line.

FTTC (Fibre to the Cabinet) Provides fibre to the cabinet, shortening copper cable length requirements to enhance speed

FTTP (Fibre to the Premises) Provides fibre direct to the premises at a lower cost than that of standard lease line products

LLU (Local Loop Unbundling) Is the process by which third party network operators are able to install equipment into BT exchanges in order to deliver their own services without having to utilise BT's network.

BT Infinity (British Telecom) Fibre to the cabinet/premises delivered services from enabled exchanges providing broadband speeds of up to 80Mbps download (subject to conditions) at a lower cost to that of traditional leased fibre services.

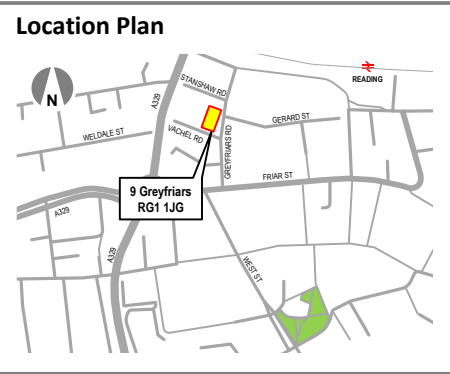
Mobile Voice / Data Appraisal - Coverage Predictions

9 Greyfriars, Greyfriars Road, Reading, Berkshire RG1 1 JG

STRUCTURE

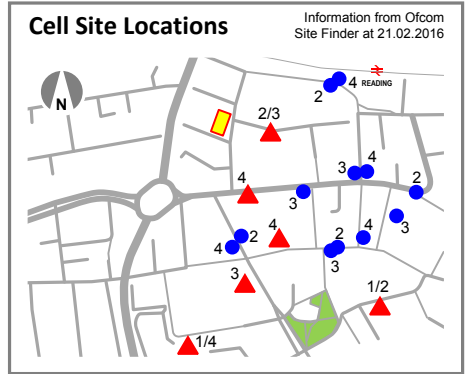
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TOPOGRAPHY

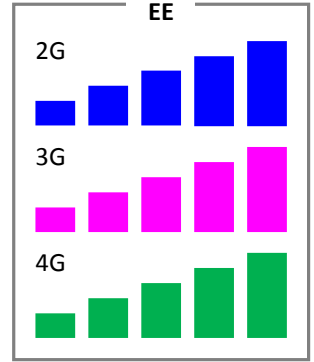
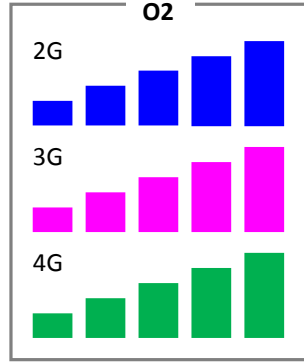
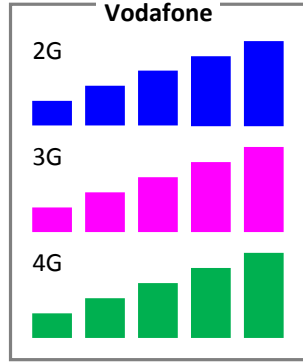
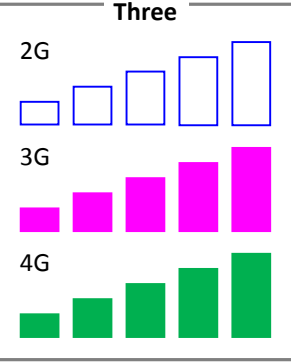


Cell Site Information
 ▲ Macro site typically >10m above ground level
 ● Street level micro cells typically <10m above ground level
 All locations are approximate only

Operators
 1. Three
 2. Vodafone
 3. O2
 4. EE



STREET LEVEL COVERAGE



OBSERVATIONS

9 Greyfriars affords an excellent level of macro coverage from all operators for 2G, 3G and 4G services. The closest serving cells are detailed in respect of 2G, 3G and 4G services and can be seen vary in location and distance, providing general coverage to the building. Any high concentration of users within the building may impact on the capacity available especially if this is confined to any one single network operator. Based on this information it is considered to be a location that affords an excellent level of overall coverage across all operators at street level for 2G, 3G and 4G services.

COVERAGE KEY - Street Level

- No coverage at this location
- ▣ Limited external coverage, indoors unlikely
- ▢ External coverage variable with limited indoor capability
- ▣ External coverage most areas, variable indoor capability
- ▣ Good external coverage, indoor coverage in small buildings
- ▣ Excellent external coverage, good indoor coverage in most buildings

PREDICTIONS

Surrounding buildings, the distance and direction of the serving cells and building construction can all impact on the penetration of signal throughout a building. Based on the location and serving cells, it is envisaged that a good/variable level of coverage will be present throughout the building for 2G, 3G and 4G services, with some potential degradation of service in the internal stairwells and lifts. In cases of coverage issues, each of the operators can provide solutions to enhance their service of which we can provide details and assist in their procurement and installation should they be required. Further to the coverage levels, the availability of service is dependant on capacity. This is the volume of data and simultaneous voice calls the macro cell can accommodate at any one time. Capacity issues result in 'network busy' messages or dropped calls. The level of capacity can be addressed by the operators should the building be populated with a high number of users on a single network which will impact on both them and others using the same cell.

INDOOR SUMMARY

OPERATOR	2G	3G	4G
Three	0	4	4
Vodafone	4	4	4
O2	4	4	4
EE	4	4	4

EE operates under both the TMobile and Orange brands within the United Kingdom / Three operates a 3G/4G network only

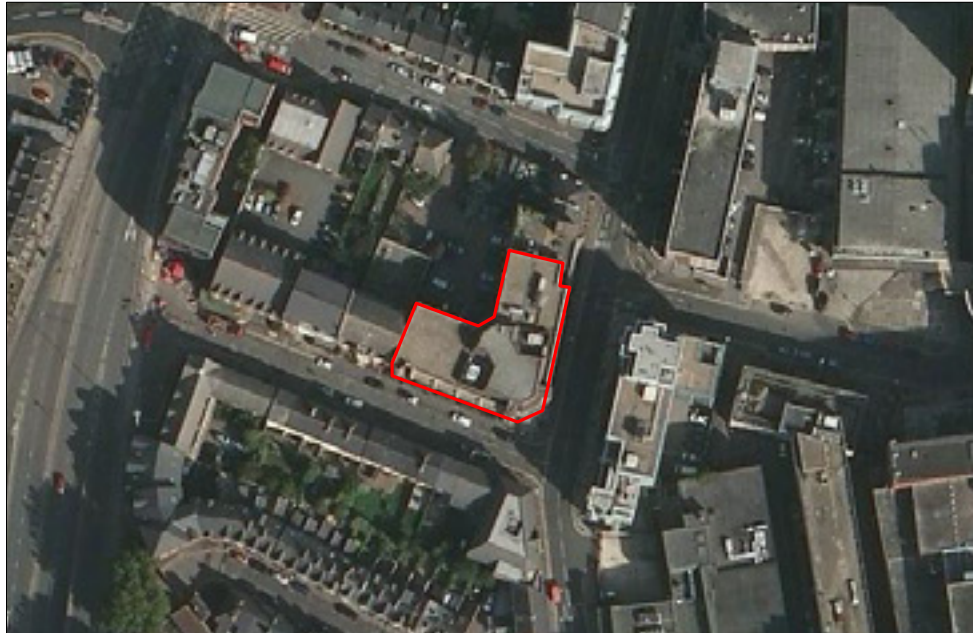
COVERAGE KEY - Indoor prediction

- 0 NONE (No indoor coverage at this location)
- 1 POOR (Indoor coverage unlikely)
- 2 LOW (Limited indoor coverage)
- 3 FAIR (Variable coverage in all buildings)
- 4 GOOD (Good to small buildings, variable in larger buildings)
- 5 EXCELLENT (Good coverage in most buildings and areas)

It should be noted that the location, building fabric / materials, surrounding environs impact on the ability of RF penetration and these predictions are for guidance only.

Fixed Telecoms Appraisal Summary

In addition to the Fixed Network carrier study completed, a review by survey of the building was undertaken on the 17th February 2016. The purpose of this survey was to clearly identify the presence of existing fixed telecommunications carrier's infrastructure in the building, adjacent to or within the local environs.



SITE AERIAL VIEW (Building highlighted in red)



LOOKING NORTH ALONG GREYFRIARS ROAD



LOOKING SOUTH ALONG GREYFRIARS ROAD

Local Carriers

9 Greyfriars has existing access for telecommunications from the BT chamber / manhole located outside of the main entrance at the junction of Vachel Road with Greyfriars Road (See **Photograph 1**). The existing level of telecommunications infrastructure adjacent to the building is excellent extending to that of BT, Virgin Media, Vodafone, Level 3 and City Fibre with existing chambers located in the carriageway and footways along the length of Greyfriars Road and beyond (See **Photographs 2, 3, 4, 5 & 6**). The presence of these carriers over and above that of BT indicates continuous network passing by the building providing excellent opportunities for diversity of service if required. Typically the presence from BT and Virgin Media is extensive with infrastructure along Greyfriars Road with extension into both Stanshaw Road to the north and Vachel Road to the south of the building. The location of chambers from Vodafone and City Fibre are all in close proximity of the main entrance, with a noted chamber directly outside the entrance in the footway for Level 3. Based on this level of infrastructure we consider connection into the building for any of the carriers over and above BT can be provided within short timescales subject to local highway permits and requirements.



PHOTOGRAPH 1
 EXISTING BT AND LEVEL 3 CHAMBERS OUTSIDE ENTRANCE AT JUNCTION OF VACHEL ROAD WITH GREYFRIARS ROAD



PHOTOGRAPH 2
 EXISTING BT CHAMBER AND CABINET OUTSIDE OF BUILDING IN FOOTWAY ON GREYFRIARS ROAD



PHOTOGRAPH 3
 EXISTING VODAFONE AND CITY FIBRE CHAMBERS IN GREYFRIARS ROAD OPPOSITE VACHEL ROAD



PHOTOGRAPH 4
EXISTING VIRGIN MEDIA AND VODAFONE CHAMBERS AT
JUNCTION OF GREYFRIARS ROAD WITH GERARD STREET



PHOTOGRAPH 5
VIRGIN MEDIA AND VODAFONE CHAMBERS AT
JUNCTION OF GREYFRIARS ROAD WITH STANSHAW ROAD



PHOTOGRAPH 6
EXISTING VIRGIN MEDIA CHAMBER AND CABINET IN GERARD
STREET ADJACENT JUNCTION WITH GREYFRIARS ROAD

Building Presence

Due to the ongoing refurbishment of the building all existing BT services have been removed back to the serving manhole as detailed in the previous section. The existing services will be re-installed back into the building in advance of completion to suit via extension of the existing 90mm ducts to suit. The level of existing services will extend to both copper and fibre. The copper will be presented in the main intake room on the ground floor, extend to 100-200 pairs and be terminated in a new distribution point. The fibre services (multiple fibre tubes) will be re-installed in the same location and terminated to suit. From this main intake position containment will be provided at high level into the main central building riser with containment for access to all floors and their associated suspended ceilings and raised access floor voids. In addition to the BT services, two additional 90mm diameter ducts will be provided from the main intake room to the public highway at the junction of Vachel Road with Greyfriars Road for use of any alternative carriers as and when required.

Service Availability

The standard services afforded by BT over its existing copper networks provides a level of broadband services with speeds expected in the region of 15-17Mbps. This exchange has been enabled to provide BT Infinity services over fibre with speeds of up to 80Mbps download and 20Mbps upload but is currently not showing availability of these services to this location (Data via the BT website). However, the current level of business tariff services available from BT will provide an excellent level of service at this time affording any level of speed and bandwidth required over fibre products. Furthermore, there are a host of companies that can provide enhanced products over the existing infrastructure providing smaller businesses a more affordable level of service if so required. The location of the alternative carriers and their available services will afford any incoming tenant a good level of choice, albeit subject to connection and associated requirements.

Summary

Based on the level of infrastructure and the availability of services from BT's local exchange for both copper and fibre products, we consider 9 Greyfriars has an excellent/good level of connectivity with the ability to enhance this by means of additional fibre services where required in minimal timescales from order. The presence of Virgin Media, Vodafone, Level 3 and City Fibre outside of the building and in the local environs affords any incoming tenant a good choice of providers at this time via the provided duct entries, albeit subject to any associated approvals and wayleaves and required network connections by the carriers.