Mobile Phone Signal Coverage Survey February 2018 – Cherwell District

Final Report

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Contents

Introduction

This report summarises the findings of a survey commissioned by Overview & Scrutiny Committee in January 2018. The survey was designed to deliver insight into the quality of mobile phone signal for Cherwell residents throughout the district, particularly targeting those users who suffer from poor connectivity to their mobile network provider.

The survey opened on 9 January 2018 and closed on 23 February 2018 with 224 individual responses to the survey. Twenty-one residents did not provide their postcode or other information allowing their location to be identified, and two respondents provided a postcode which indicated they were living outside of the Cherwell district; these results have been disregarded for the purposes of this analysis.

Each respondent was able to rate their phone signal quality as 'Intermittent' (highest), 'Poor', or 'Non-existent' (lowest). Information about the location where they experienced this issue, and other ancillary information such as mobile network provider and handset brand were also collected.

Survey Responses Summary

Phone Signal Quality

The below graph shows the distribution of answers for the survey question *'Please rate the quality of your signal':*

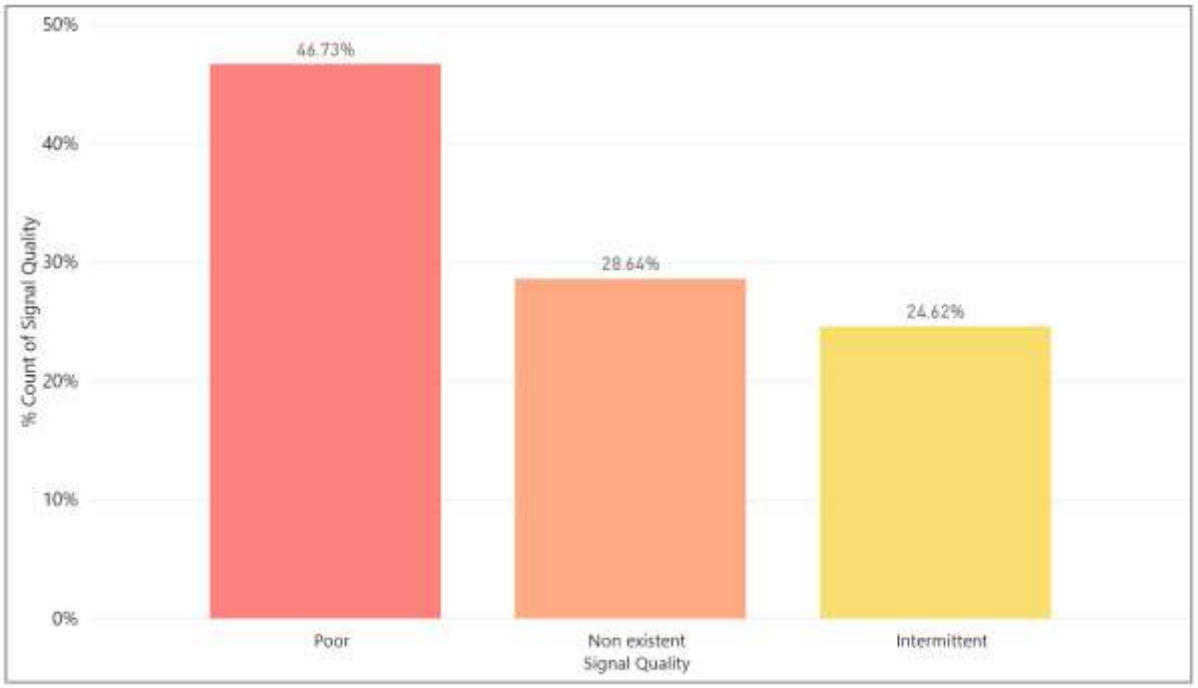


Figure 1 - Total survey responses of how each respondent rated their mobile phone signal quality. 'Intermittent' is best quality, with 'Non-existent' being lowest quality.

1.1 Mobile Phone Network Providers

A question in the survey asked '*Please select your mobile network'*. The results of this are shown below:

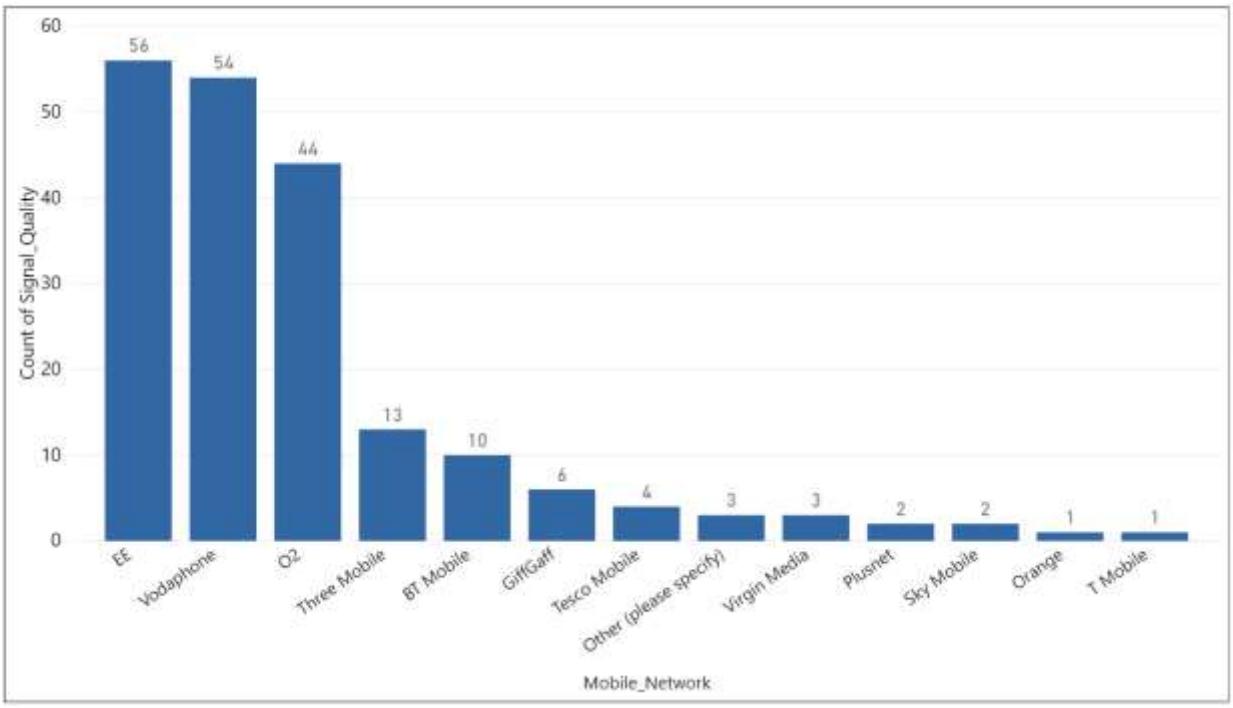


Figure 2 - Count of mobile networks used by survey respondents.

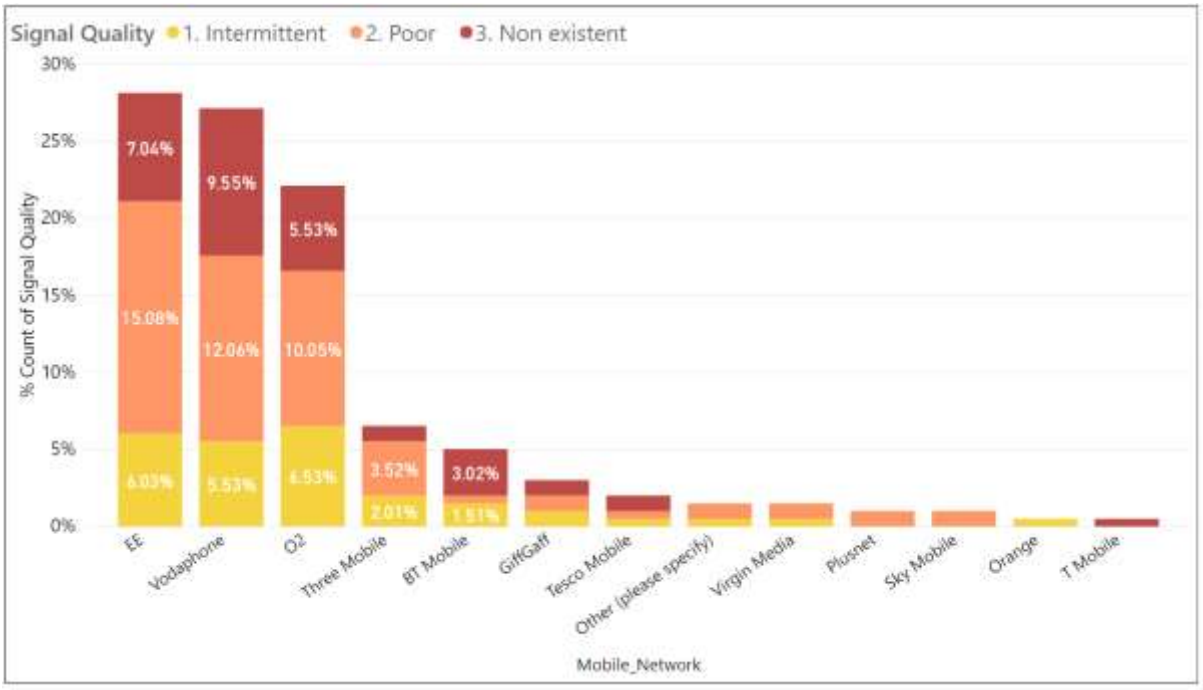


Figure 3 - Count of responses to question "Please select your mobile network", this graph includes the proportion of how customers rated their mobile phone signal within each mobile network.

As you can see from Figure 3 each provider had approximately the same distribution of responses, and considering the relatively small sample size, there do not appear to be any statistically significant variance in responses for each network provider.

Manufacturer of Handset

As with the questions about mobile phone provider, the majority of respondents selecting 'iPhone' and 'Samsung' is more likely to be based on market share of the manufacturers rather than them being a direct cause of poor signal. This is indicated by a relatively equal distribution of responses reporting the quality of signal across each device, as shown in the below graph:

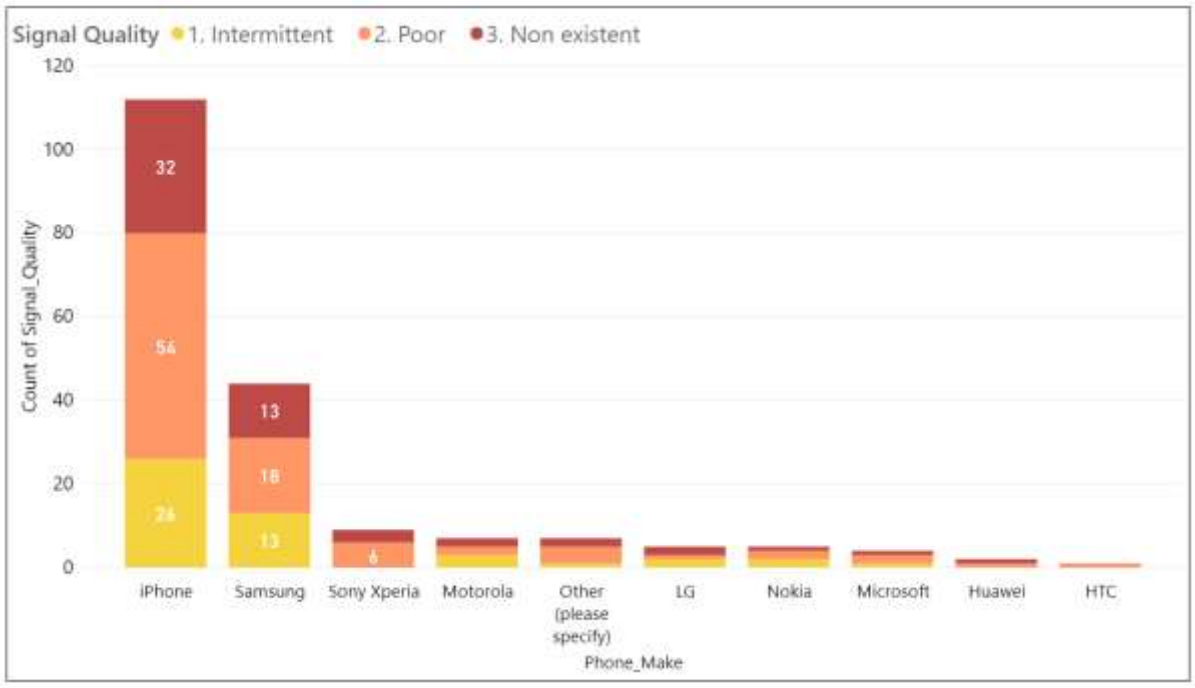


Figure 4 - Responses to the survey question "Please select your make of mobile phone", broken down by responses to signal quality.

As a result it would not be fair to conclude that handset is a predictor of poor mobile signal, and as a result further breakdowns of this have not been included on a per ward basis.

Geographical Analysis of Results

The below map shows the distribution of responses throughout the Cherwell district, denoted as red, yellow or orange dots depending on response type. Purple hot-spots show the areas with the highest frequency of responses.

Inclusion of LLPG communication mast data [1]

To provide additional context, the location of existing telephone communications masts have been included on the map. It is worth noting that there appears to be an inverse correlation between

[1] Mobile phone mast data comes from extract of Local Land and Property Gazetteer (LLPG). This is a corporate database and provides the definitive identification of all land and property within Cherwell and South Northants Districts. The data extraction for this report was performed February 2018. The LLPG contains details of any current communication masts, many of which are owned and operated by mobile phone providers so may directly influence the quality of signal within each area.

locations of phone masts, and reports of poor mobile network signal, particularly in the Shutford area.

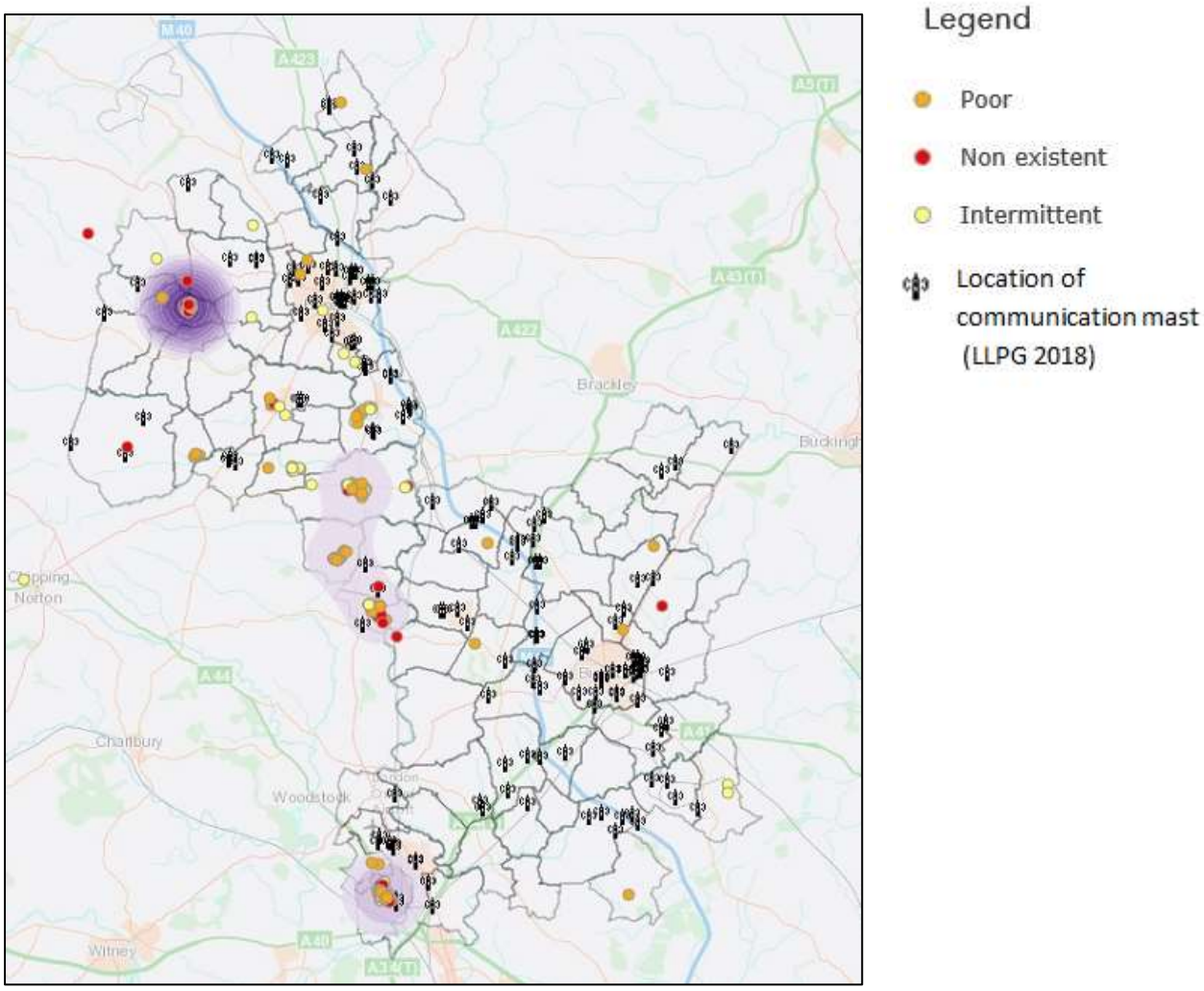


Figure 5 – Overview of Cherwell District - Crown copyright and database right 2018. Ordnance Survey 100018504

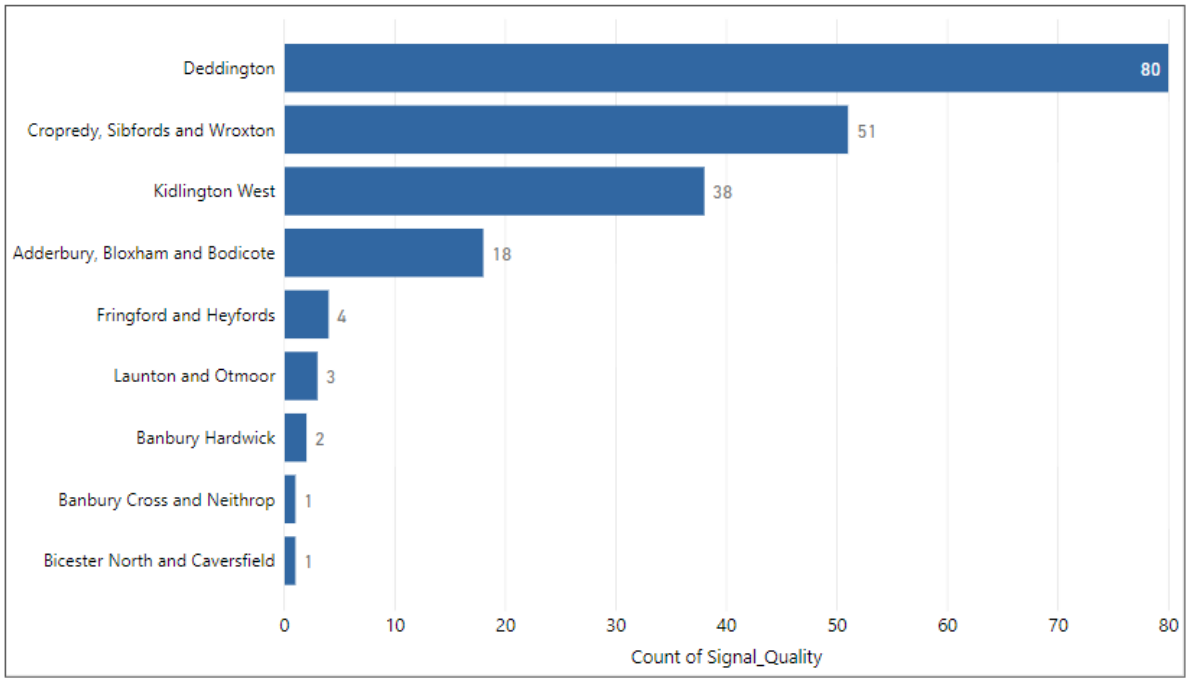


Figure 6 - Breakdown of responses by ward. Please see below graphic for how this breaks down by signal quality.

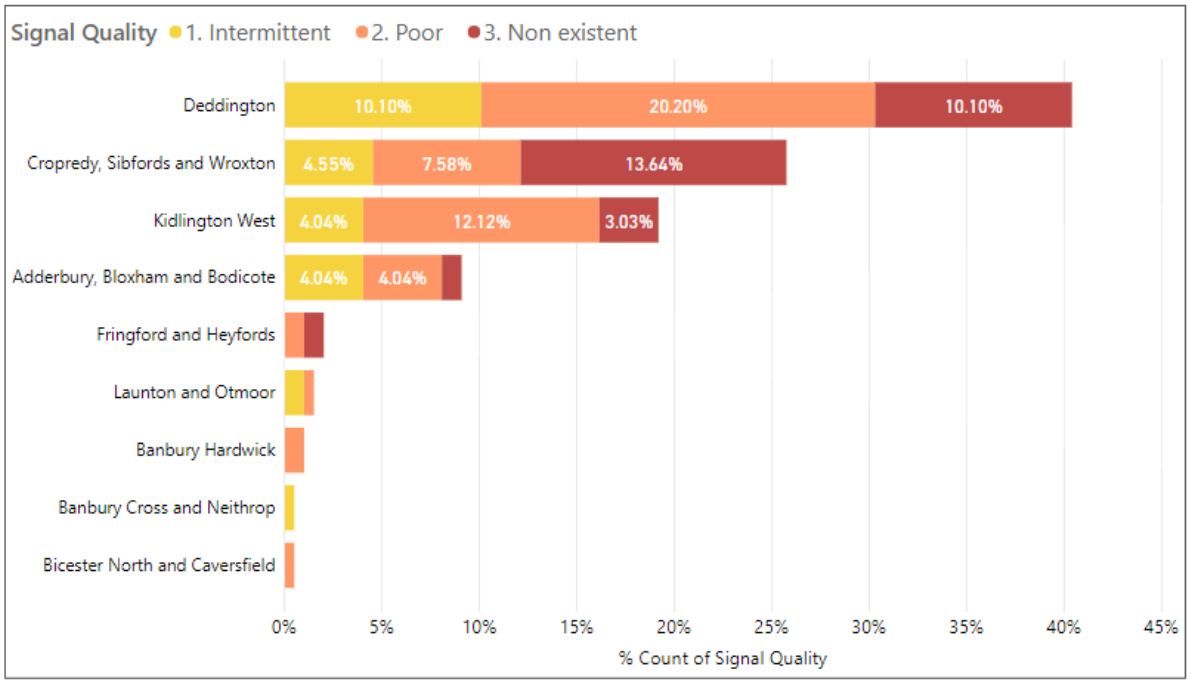


Figure 7 - Breakdown of responses by ward, including the proportion of how each ward population rated their reported signal quality.

As indicated by the above map and chart, four wards within Cherwell represented the majority of responses to the survey received (93% in total). These were:

- Deddington (40%)
- Cropredy, Sibfords and Wroxton (25%)
- Kidlington West (19%)
- Adderbury, Bloxham and Bodicote (9%)

These hotspots are shown in more detail below:

Cropredy, Sibfords and Wroxton Ward (Shutford) Results

The heaviest concentration of survey replies across Cherwell can be found in the Shutford area:

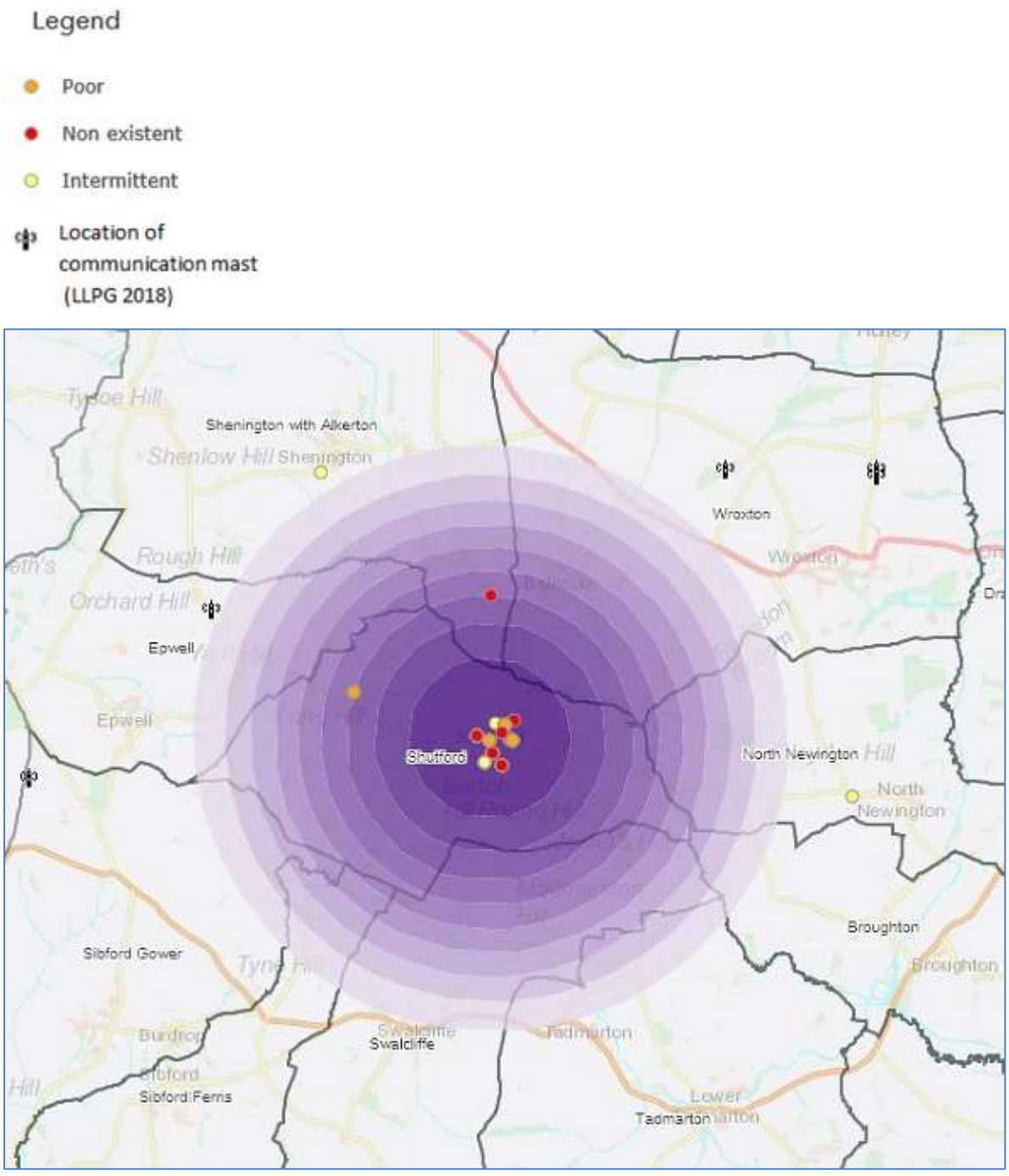


Figure 8 - Overview of Cropredy, Sibfords and Wroxton Ward area - Crown copyright and database right 2018. Ordnance Survey 100018504

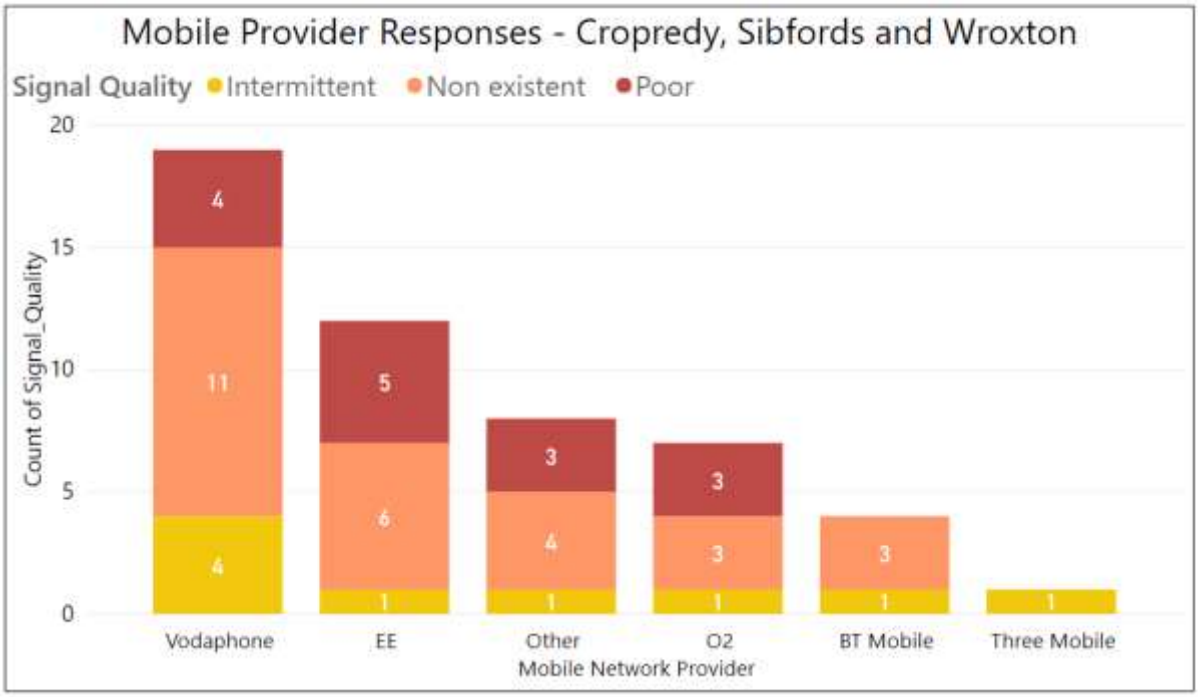


Figure 9 - Graphical representation of ward responses to mobile phone provider, broken down by reported signal quality.

Adderbury, Bloxham and Bodicote Ward Results

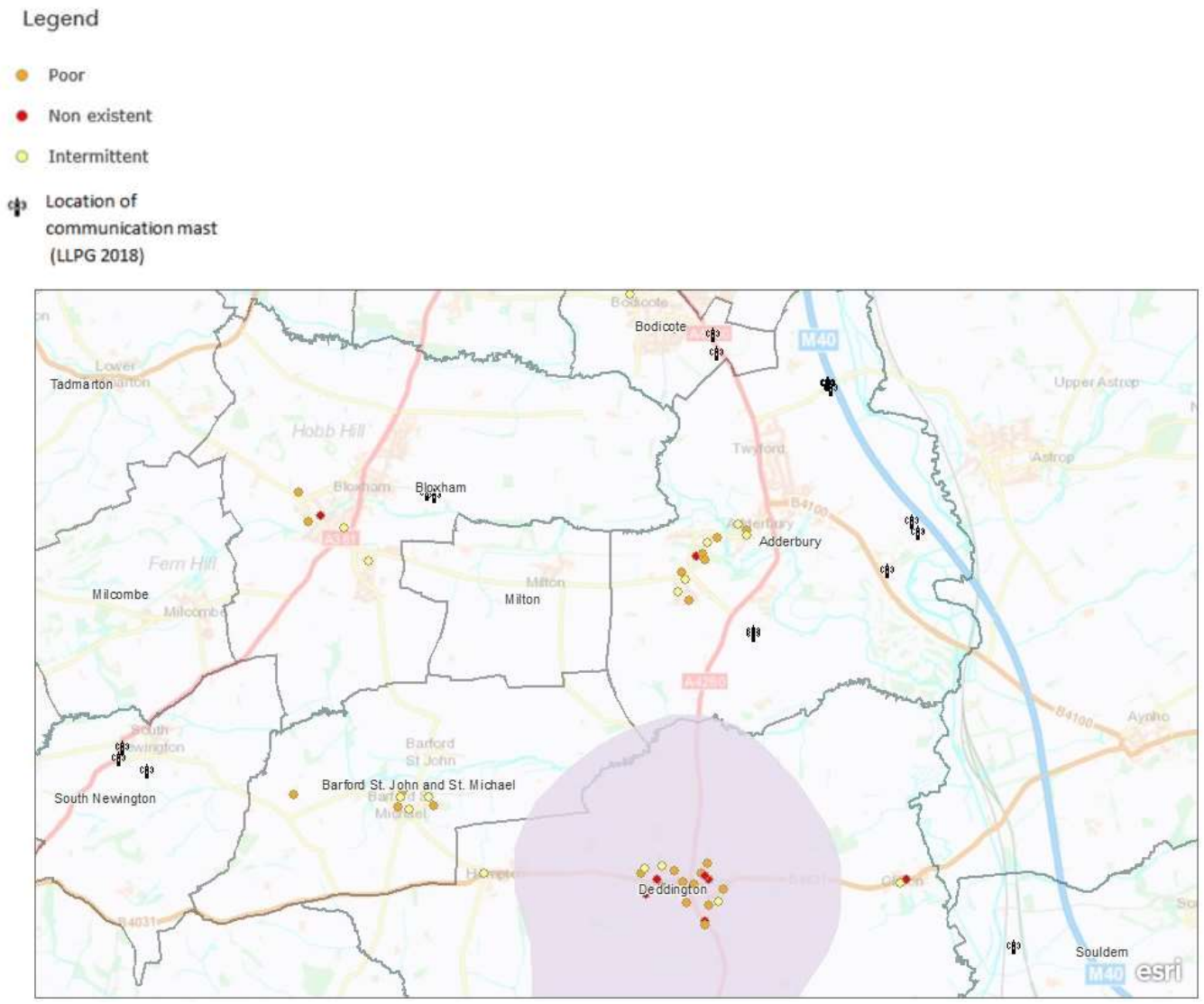


Figure 10 - Overview of Adderbury, Bloxham and Bodicote Ward area - Crown copyright and database right 2018. Ordnance Survey 100018504

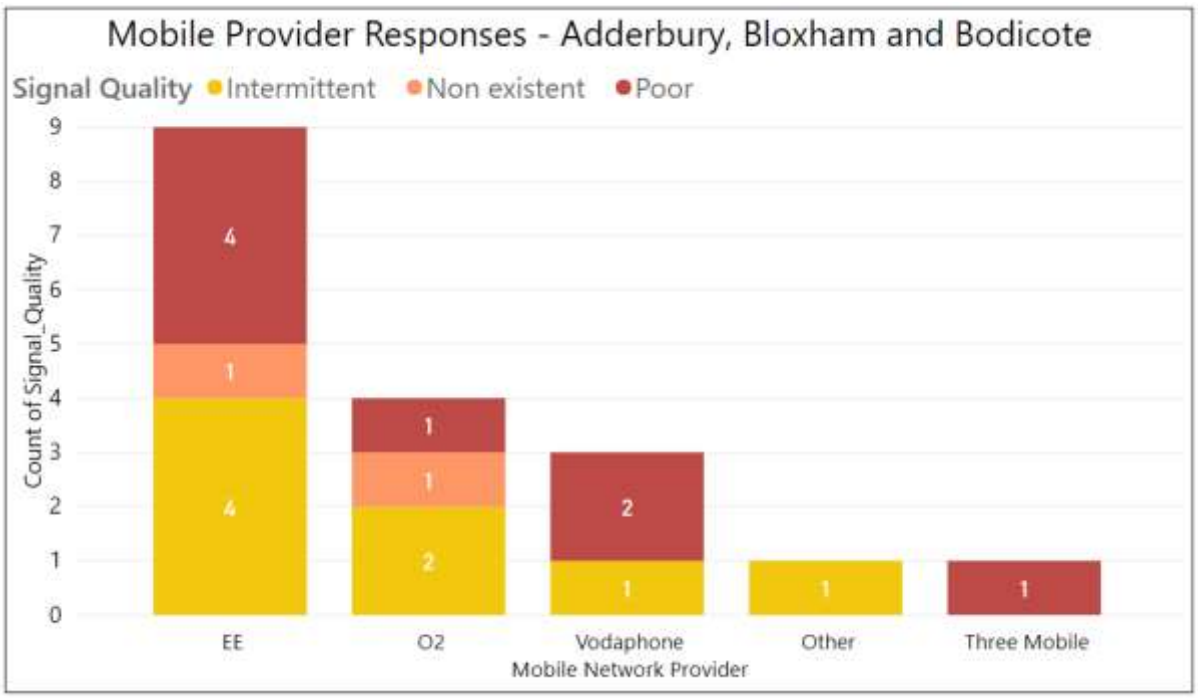


Figure 11 - Graphical representation of ward responses to mobile phone provider, broken down by reported signal quality.

Deddington Ward Results

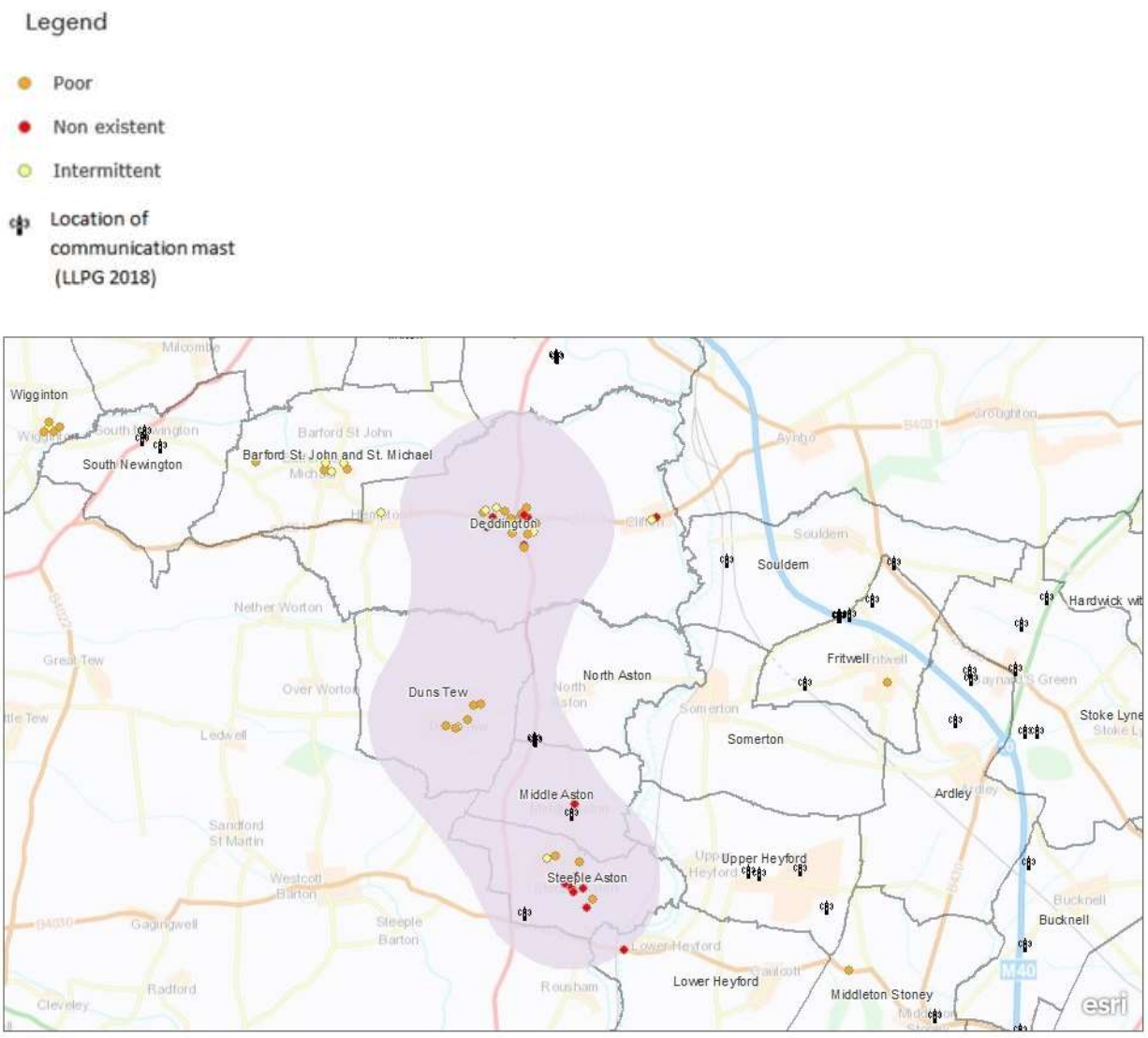


Figure 12 - Deddington Ward area - Crown copyright and database right 2018. Ordnance Survey 100018504

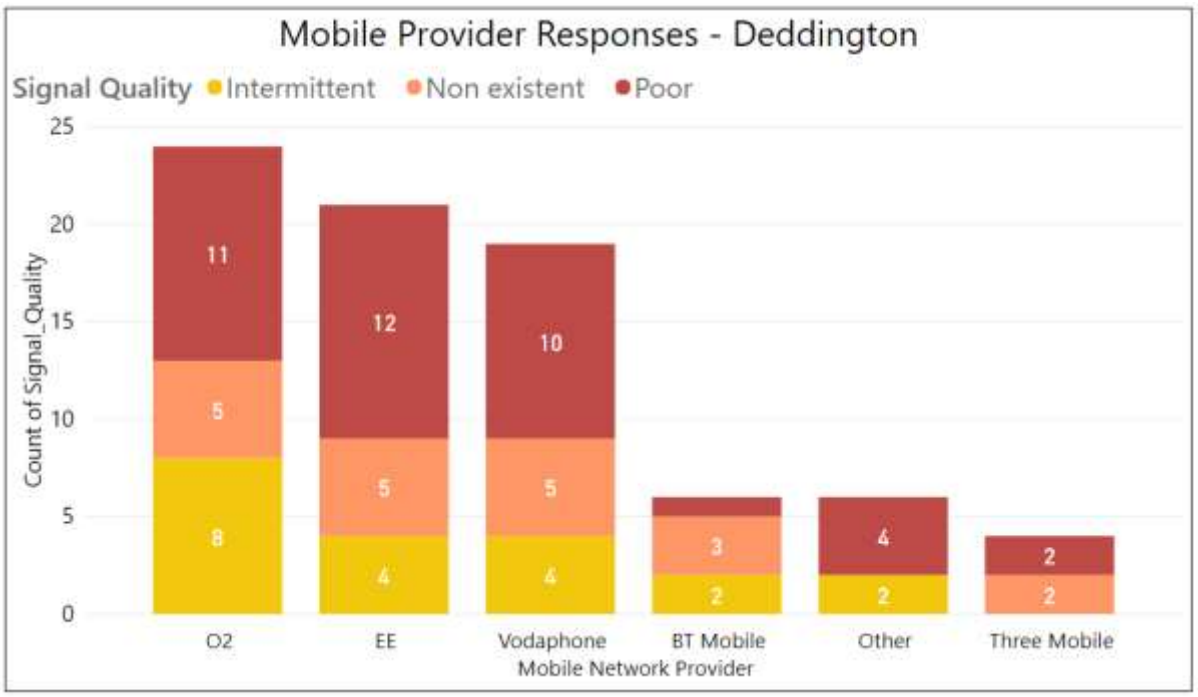
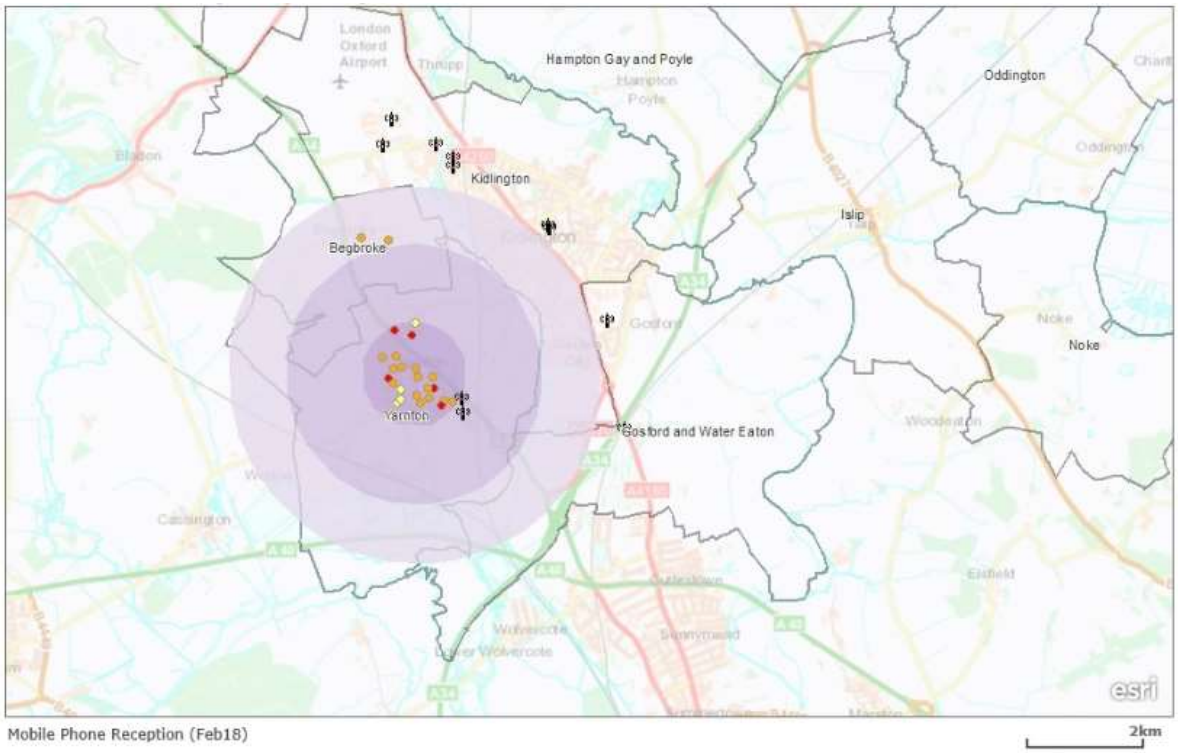


Figure 13 - Graphical representation of ward responses to mobile phone provider, broken down by reported signal quality.

Kidlington West Ward Results



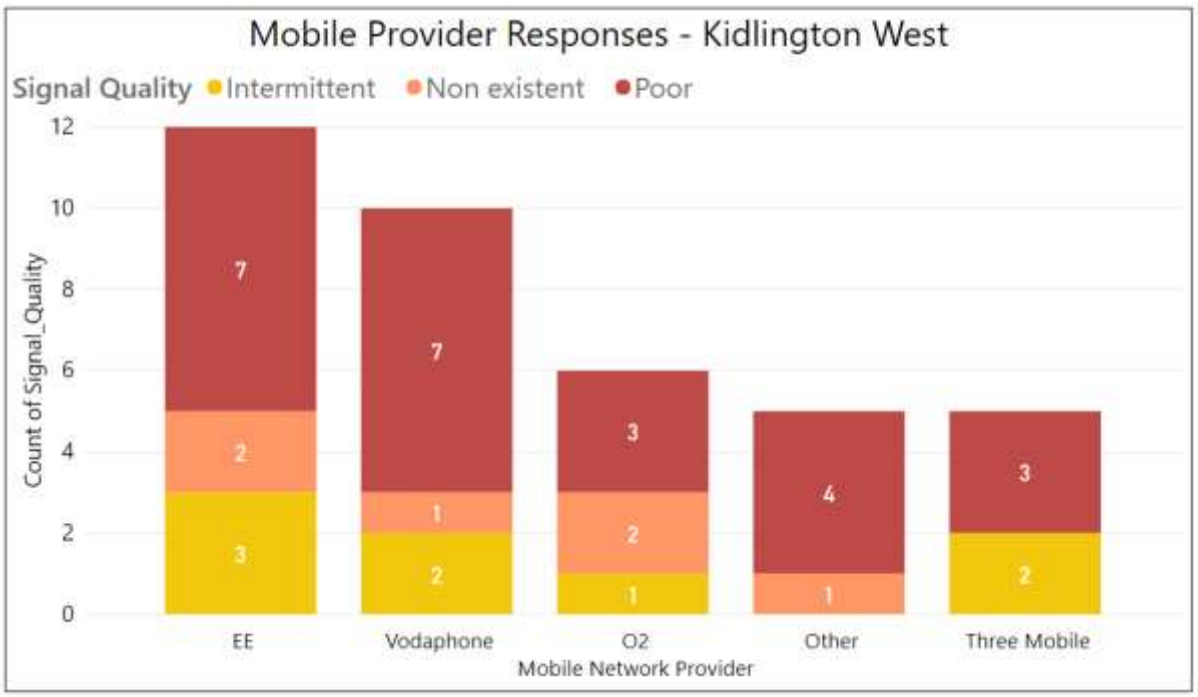


Figure 14 - Figure 11 - Graphical representation of ward responses to mobile phone provider, broken down by reported signal quality.

Conclusions

The relatively small sample size (224 responses) renders it difficult to draw any statistically significant conclusions from the survey. Particularly as, there does not appear to be any significant correlation between users suffering poor or no signal and either the make of handset or mobile phone provider.

The majority of users responding to the survey were customers of EE, Vodafone and O2. However, this is perhaps more likely to be down to their market share rather than these providers being the cause of poor quality signal. It is difficult to determine this exactly, as there is no available information regarding their respective customer base in the Cherwell area, and no published contextual information such as benchmarks. Notably, the quality rating of signal did not vary significantly between each network provider, suggesting no single provider performs any worse than its peers in relative terms. This is shown below in Figure 3.

However, there are trends we can identify as areas for future exploration. Primarily, almost all of the responses came from areas within Cherwell considered to be rural; almost no reports came from the Banbury or Bicester area. This would suggest that perhaps the main driver of poor quality mobile signal is the placement of mobile phone communication masts within the Cherwell District. Communication masts (many of them operated by mobile network providers) are placed densely within the three main population centres of Cherwell (Banbury, Bicester, and Kidlington), where there were very few, if any, reports of poor phone signal.

In rural areas (particularly Deddington, Cropredy, Sibfords and Wroxton), these communication masts appear much more sparsely, and it is within these areas where there are a frequent number of

survey responses reporting poor signal (Please refer to the second section of this report – "Geographical Analysis of Results" for more details). It is worth bearing in mind that, while this inverse correlation does appear quite strongly visually, this may be superficial and a direct link (causation) cannot be proved without further research in this area. Please note Kidlington West has two communication masts relatively close to its centre in nearby Yarnton, and as such appears to be a slight exception to this rule.

Options

1. **Option 1** is to complete another consultation, with a view to obtaining greater numbers of participation and widening the scope of the survey to include additional questions to gauge where positive mobile phone signal is received throughout the district. Increased participation numbers (approximately 800-1000) would provide a robust evidence base, and we would expect to see the distribution of responses expand into the main population centres which would allow for blackspot comparison. With increased participation numbers the possibility of identifying additional correlating factors will increase, and will prove a more solid evidence base for any conclusions going forward.

Including the option for additional answers around positive responses to mobile phone signal will provide more context for any blackspots identified; rather than focusing exclusively on users with poor signal. Comparing users with poor signal by location to users with good signal will serve as a benchmark for what could be called the "average coverage" for the district, enabling easy identification of areas which fall significantly below this. With the current data we are unable to calculate any such benchmark for relative comparison. For instance, this will enable us to effectively test the hypothesis that there is a relationship between mast data and mobile phone signal.

2. **Option 2** is to review the above report and use the results within the Overview & Scrutiny committee meeting to facilitate further discussion around mobile networks and a agree a set of actions with the 224 responses.

Footnotes

[1] – Mobile phone mast data comes from extract of Local Land and Property Gazetteer (LLPG). This is a corporate database and provides the definitive identification of all land and property within Cherwell and South Northants Districts. The data extraction for this report was performed February 2018. The LLPG contains details of any current communication masts, many of which are owned and operated by mobile phone providers so may directly influence the quality of signal within each area.