

## Your response

Question	Your response
<p><b>Question 1:</b> Please provide a description of your current use of fixed links (or indicate which of the use types in Table 3.1 best describe your use type)</p>	<p>Confidential? – No</p> <p>Airwave uses its fixed links to provide a communications network for the emergency services and therefore is a Public Safety User Type.</p> <p>The Airwave Network represents part of the UK’s Critical National Infrastructure.</p>
<p><b>Question 2:</b> What are the factors driving your choice of fixed links over alternative connectivity solutions, and which factors have the biggest impact on your decisions? Is this likely to change in the next 5 years? If so, what do you expect will change?</p>	<p>Confidential? – No</p> <p><b>1) <u>The Lack of Available Fibre.</u></b></p> <p>The main factor driving Airwave’s choice of fixed links over alternative solutions is the lack of available fibre in many geographic locations.</p> <p>The Airwave Network provides coverage throughout the UK land mass and includes a number of sites located in remote areas and far from fibre points of presence (PoP).</p> <p>For Airwave sites in remote areas where fibre is not readily available, bringing fibre to base stations may not be economically viable or is often prevented by wayleave or physical impediments.</p> <p>In certain cases, microwave solutions may cost more than fibre but is still preferred as lack of availability of fibre means that Airwave must resort to multi-hop fixed link solutions and it is important that Ofcom maintains flexibility and choice of bands for fixed links spectrum to meet the deployment needs or operational challenges of the operators.</p> <p><b>2) <u>The withdrawal of copper based services</u></b></p> <p>✂</p> <p>✂</p> <p>✂</p> <p>Airwave is currently undertaking a programme to migrate its Network away from copper as these services are being withdrawn from support by BT in November 2025. Airwave is reliant on fixed</p>

links for connectivity where fibre is not available to replace copper services.

### **3) The limitations of alternative solutions**

Another key factor driving Airwave's reliance on fixed links is that alternative solutions may not provide sufficient connectivity to enable Airwave to meet its commitments to its customers. For example, satellite connectivity may not provide sufficiently low latency to enable Airwave to meet its contractual obligations. In addition, satellite providers do not always provide service level agreements and therefore these solutions are not suitable for supporting mission-critical networks.

The limitations of alternative solutions and the non-availability of fibre in more rural or remote areas has resulted in Airwave relying on fixed links to mitigate the impact of the withdrawal of copper-based services. Airwave does not see economic incentives to reverse this trend over the next 5 years.

### **4) Dual links**

Due to recent changes in 1.4 GHz and 26 GHz spectrum, Airwave needs to replace fixed links resulting in an increase in the number of fixed links Airwave operates.

As new links in new bands are deployed replacing links operated in 1.4 GHz and 26 GHz "closed bands", there are network deployment dependencies that require dual rings of links be operated until a complete fixed link ring or transmission network area is replaced with new so that the old links can be decommissioned.

**Question 3:** Is the current spectrum available for fixed links in the UK suitable and sufficient for your needs? If not, what would you change and why? If you believe changes are required, please give specific examples and reasons along with supporting evidence if available.

Confidential? – No

Airwave believes that the current spectrum available for fixed links in the UK is not sufficient to meet customer requirements. The total amount of spectrum available for new fixed link assignments in the UK has decreased while Airwave's use of fixed links is increasing. Airwave now faces having to replace an increased number of fixed links to alternative bands in a diminishing spectrum ecosystem.

Furthermore, Airwave is concerned that Ofcom's recent approach has been to accommodate the requirements of new

	<p>entrants by forcing the migration of incumbent users out of bands entirely rather than finding a middle ground. In Airwave’s response to the 26 GHz consultation, it recommended reserving a paired block of 200 MHz for fixed links while making the rest of the band available for new uses. This would have resulted in 90% of the 26 GHz band being made available for new services. Ofcom did not adopt this suggestion.</p> <p>Airwave recommends that Ofcom safeguard all remaining spectrum bands for the operation of fixed links and reconsider its decision to reject Airwave’s recommendation to preserve 200 MHz in the 26 GHz band for fixed links.</p> <p>New entrants in the 1.4 GHz band have also caused interference issues that have degraded the service that Airwave provides to the emergency services (as described in Airwave’s letter to Ofcom on 9 November 2023 entitled “Airwave Solutions Ltd (Airwave) Representation - Proposed revocation of Point-to-Point Fixed Link Licences”). These interference issues are likely to be exacerbated in the 26 GHz band as 26 GHz links generally carry more traffic than 1.4 GHz links due to their use in urban areas. In addition, Ofcom has weakened the protection for incumbent users in the 26 GHz by removing the requirement for new users to work with incumbent users where interference is found. Airwave recommends that Ofcom should replicate the approach followed in the 1.4 GHz band in the 26 GHz band in relation to handling interference.</p>
<p><b>Question 4:</b> Is there anything about Ofcom’s current framework for authorising fixed links which you consider could be improved?</p>	<p>Confidential? – No</p> <p>Airwave is in the process of migrating its links out of the 26 GHz band with the majority of these links being rehomed into the 23 GHz band. There is a risk that the 23 GHz could become congested making it difficult for Airwave to complete the migration of fixed links away from the 26 GHz band.</p> <p>To address this concern, Airwave recommends that Ofcom preserve 200 MHz in the 26 GHz band for the operation of Fixed Links while making the rest of the band available for new uses.</p>

**Question 5:** How has your use of fixed links changed between 2016 and now? Please provide information on:

- Reasons for increase or decrease in the number of your links since 2016;
- Changes in the capacity of your links since 2016, including how you have delivered this capacity change, e.g., different channel bandwidths, different link technology (please specify), etc.

Confidential? – No

The Airwave Network has been relatively stable since 2016 in terms of the customers it serves and their requirements. However, the number of fixed links operated by Airwave increased from 2016 to 2023 due to:

**1) The withdrawal of copper based services**



Airwave is currently undertaking a programme to migrate its Network away from copper as these services are being withdrawn from support by BT in November 2025.

Where fibre has not been available to replace copper services Airwave has been forced to rely on fixed links for connectivity.

**2) Dual links**

The number of fixed links operated by Airwave has also increased due to the need for dual links as a result of Airwave's exit of the 1.4 GHz and 26 GHz bands. Operating dual links has occurred where Airwave has had more than one licence in operation for a particular link as a result of an overlap in the migration of services to alternative bands from bands that Ofcom has closed.

Generally speaking, the channel bandwidth of Airwave's links has been unchanged since 2016.

**Question 6:** How do you expect your usage to change over the next 5-10 years? Please provide information on:

- any increase/decrease in the number of links (by band) and bandwidth expected;
- likely changes in geographic distribution of links;
- likely changes in distribution of links by frequency band;
- likely changes in capacity of links and how you expect to deliver this capacity;
- other changes not covered above

Confidential? – No

Airwave's reliance on fixed links is likely to continue to increase over the next five years as the impact of withdrawal of copper based services, lack of available fibre, and dual links continue to have an effect.

The programmes to exit the 1.4 GHz band and 26 GHz bands have seen migration of links into neighbouring bands (such as the 7.5 GHz for the 1.4 GHz and the 23 GHz for the 26 GHz).

Airwave may be required to further redistribute its fixed links if Ofcom imposes further band closures or restrictions.

**Question 7:** Which of the developments listed above are expected to have the biggest impact on your use of fixed links? Are there other developments to be aware of that have not been listed?

Please explain the reasons for your answer.

Confidential? – No

A move to centralised radio signal processing in datacentres, rather than mast sites will not impact on Airwave’s use of fixed links as the Airwave Network does not utilise this architecture.

In addition, the densification of mobile networks using small cells will not have an impact on Airwave’s use of fixed links as the majority of Airwave sites are macro cells covering a relatively small number of users. The Airwave use case is for coverage rather than capacity with the majority of use cases being served by the frequency bands that are currently available.

The Airwave Network will utilise physical cables in the form of fibre connectivity for its network infrastructure where fibre is available.

However, despite fibre being a viable option for Airwave, the actual usage of fibre is underutilised due to lack of availability within rural and remote areas. The Airwave Network provides geographic coverage throughout the UK land mass and therefore has a number of sites located in remote areas, far from fibre points of presence (PoP).

**Question 7a:** Are you considering using NGSO satellites to provide backhaul for your network? If so, please provides details of the capacity requirements/expectations and the locations where delivery of this type of backhaul would be likely.

Confidential? – No

Generally speaking, satellite connectivity (including NGSO satellites) does not provide a low enough latency to allow Airwave to satisfy its contractual obligations to its emergency services customers. In addition, many satellite providers do not provide service level agreements with their services and therefore the solutions offered are not generally suitable for deployment in a mission critical network.

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Question 8: If you already use alternative transport options for delivering your services, please:

- Provide an indication of the proportion of your services delivered over fixed links vs each alternative that you currently use. Is this proportion likely to change over the next 5-10 years? Is so please provide details;
- Explain how your business rationale for use of fixed links vs alternative connectivity solutions is changing over time;
- If possible, provide examples of your decision-making process for recently deployed connections

Confidential? – No

Connectivity in the Airwave Network is currently made up as follows:

- Fixed Links - 61%
- Lease Lines - 38%
- Satellite - <1%

Airwave’s reliance on fixed links is likely to increase over the next five years as it migrates its services away from copper. Where viable fibre is not available to replace copper services, Airwave will be forced to rely on fixed links for connectivity. Dual running as a result of Airwave’s replacement of the 1.4 GHz and 26 GHz links will also cause the number of fixed links operated by Airwave to increase. As a result of dual links and the withdrawal of copper based services, Airwave now is having to redesign, procure and replace a greater number of fixed links in a diminishing spectrum ecosystem.

The number of links using satellite connectivity is unlikely to increase materially as satellite connectivity does not provide sufficiently low latency to enable Airwave to meet its contractual obligations. In addition, many satellite providers do not provide service level agreements and therefore the services offered are not suitable for a mission critical voice network.

Question 9: Which of the listed technologies are you already using or do you plan to use in the future? For each that you are using/plan to use, please explain:

- the current extent of your use, whether you expect to expand or shrink your use over the next 5-10 years, and how availability of these capabilities might impact your choice to deploy fixed links vs an alternative.

Estimates of numbers or percentage of links deployed with each capability now and in the future would be valuable. We are particularly interested in feedback on future use of BCA.

Confidential? – No

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Airwave’s use cases prioritise coverage over capacity and therefore the vast majority of Airwave’s Fixed Links are for a longer hop length than can be offered by either the W or D bands (which provide for high capacity short hop links). Therefore, the W and D bands do

	<p>not offer suitable connectivity for Airwave's fixed links.</p>
<p><b>Question 9a:</b> If you plan to use BCA would you plan to use this primarily for new links, upgrades to existing links or a mix? What factors affect your decision to deploy (or not deploy) BCA today? Please provide whatever detail you can</p>	<p>Confidential? – No</p> <p>✂ ✂ ✂ ✂ ✂</p>
<p><b>Question 10:</b> Do you have a need for W and D bands for fixed links use (or alternative uses)? If so, in what timescale? Please provide further details, including any evidence you have to support your response.</p>	<p>Confidential? – No</p> <p>Airwave's use cases prioritise coverage over capacity and therefore the vast majority of Airwave's Fixed Links are for a longer hop length than can be offered by either the W or D bands (which provide for high capacity with much wider channels deployable over short hop links). Therefore, the W and D bands do not offer suitable connectivity for Airwave's fixed links.</p>
<p><b>Question 11:</b> Do you expect to apply for new fixed links in the upper 6 GHz band in the future, and if so, in which geographical areas? What are the reasons for choosing this band over other available bands or alternative technologies? Is there a technical reason why you would choose the upper 6 GHz band?</p>	<p>Confidential? – No</p> <p>Airwave does not currently have any links in the upper 6 GHz band as its requirements have been fulfilled by the 7.5 GHz band.</p> <p>However, Airwave may consider migrating some of its fixed links into the 6 GHz band in the future given the closure of the 1.4 GHz band and the 26 GHz band and the over-congestion of other bands such as the 7.5 GHz and 15 GHz bands. The 7.5 GHz band in particular has been heavily used since the closure of the 1.4 GHz band.</p>
<p><b>Question 12:</b> Are there other international developments that you are aware of that could affect availability and utility of fixed links in the next 5-10 years?</p>	<p>Confidential? – No</p> <p>The World Radiocommunications Conference (WRC-23) recently identified the 7.5 GHz band (6425-7125 MHz) for use for mobile broadband IMT/RLAN. Moreover, WRC-23 adopted a new agenda item to study for WRC-27 the 4400-4800 MHz, 7125-8400 MHz (or parts thereof),</p>

and the 15 GHz band (14.8-15.35 GHz) for future mobile broadband.

Airwave has a considerable number of fixed links in both of the 7.5 GHz and 15 GHz bands (more than 1,300 links) and is concerned that their usage could be threatened in the future. The 7.5 GHz band in particular is the band that is most suited to long haul length since the closure of the 1.4 GHz band and rehomeing fixed links to alternative bands would be extremely difficult. Airwave recommends that Ofcom approach these fixed link bands with caution and avoid causing material and financial risks to incumbents stemming from a changing regulatory environment. It is important that existing users are granted the protection from any new services or applications being considered and that such risks like the ones we are undergoing in the 1.4 GHz and in the 26 GHz due to closure be avoided in the future.

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