

making communications work for everyone

Your response

Question	Your response
Question 1: Have we correctly identified the key changes in the utilities sector that could lead to additional spectrum requirements?	Confidential? – N No comments provided.
Question 2: What alternative communication solutions might play a role in meeting the future operational communication needs of the utilities sector, alongside or instead of additional spectrum for a private network?	Confidential? – N No comments provided.
Question 3: Are there any other spectrum bands we should consider for use by utilities?	Confidential? – N No comments provided.
Question 4: Do you have any comments on the three bandwidths we have considered that might be necessary to support a private network for utilities? Please reference our capacity analysis in annex 7 where relevant.	Confidential? – N No comments provided.

Question 5: Do you have any comments on our approach to examining each potential candidate spectrum band, including the factors relevant to assessing suitability, and the capacity and coverage	Confidential? – N No comments provided.
analysis provided in annexes 7 and 8?	
Question 6: Do you have any comments on our overview of the 400 MHz band in NI? Please consider the specific factors we have discussed in your response.	Confidential? – N No comments provided.
Question 7: Do you have any comments on our overview of the 450 MHz band in GB and NI? Please consider the specific factors we have discussed (including the coexistence analysis in annex 9) in your response.	Confidential? – N Network Rail holds business radio licences in the 450 MHz band, including an area defined licence and multiple technically assigned licences. Our response to this question considers the potential impact of a full or partial re-plan on the operational rail systems which currently use licensed spectrum in this band. We also consider future rail demand in this band.
	 Railway station radio systems Network Rail's technically assigned licences in the 450 MHz band are for railway station radio systems. A railway station radio system is a crucial component of modern rail transportation infrastructure that serves multiple important purposes to ensure the safe and efficient operation of trains and the well-being of passengers. Here are the key uses of a railway station radio system: 1. Train Communication: Enables direct communication between station personnel and train operators, including engineers and conductors. This communication is essential for conveying important information. 2. Dispatch and Control: Allows station managers and dispatchers to communicate with train operators and coordinate the movement of trains. They can make real-time decisions regarding train routing, scheduling adjustments, and handling uncontracted situations.



- 5. **Passenger Information:** Enables broadcasting of important information to passengers. Clear and timely communication helps passengers make informed decisions and navigate the station.
- Maintenance and Repairs: Maintenance crews and technicians rely on radio systems to coordinate repairs and maintenance tasks. Efficient communication is essential to minimize downtime and ensure the integrity of the rail network.
- Coordination with Other Stations: Railway networks often involve multiple stations along a route. The radio system allows for coordination between stations, ensuring the smooth transfer of passengers and goods, as well as the seamless operation of trains as they move from one station to another.
- 8. **Customer Service:** Customer service representatives at railway stations use radio systems to address passenger inquiries, complaints, and requests for assistance. This improves the overall passenger experience.

These relatively low power, local station radio systems are a vital part of operating a safe and efficient railway. Whilst these systems currently operate in the 450 MHz band, alternative spectrum could equally provide viable solutions if supported by the supply chain. Due to the vital nature of these radio systems, any future requirement by Ofcom to migrate these systems to alternative spectrum would need to be carefully planned and managed to mitigate disruption to the railway and ensure the safety of passengers, railway staff and the wider public. There will also be a cost impact on Network Rail of migrating these systems, which is currently unfunded.

Lookout Operated Warning System

Network Rail also holds an area defined licence for spectrum used by the lookout operated warning system (LOWS). LOWS is a radiobased system, introduced by Network Rail to protect the safety of trackside workers, particularly those working on open railway lines.

LOWS is operated by a number of strategically positioned lookouts who observe trains approaching the worksite. When a LOWS lookout observes a train proceeding towards the worksite, they activate the handheld unit on their person to indicate a train approaching the worksite. This activation transmits a message to the main warning unit at the site of work, which gives the workgroup a visual and audible warning of the approach of a train and that they must move to the designated position of safety.

	Network Rail has identified the vulnerability of LOWS to human error as a cause of near misses ¹ among trackside workers. ²
	Network Rail is withdrawing LOWS on a regional basis throughout Control Periods 6 and 7^3 . It is important to stress that the timeline for complete withdrawal of LOWS is dependent on the deployment of a replacement system, such as semi-automatic and automatic tracking warning systems, to keep trackside workers safe.
	Should Ofcom pursue a full or partial re-plan of the 450 MHz band, we would be grateful if Ofcom could work with Network Rail to take into account the LOWS withdrawal timetable in order to mitigate the impact of a re-plan while LOWS is still in operation. Any change to existing withdrawal plans necessitated by a re-plan of the band may have a cost impact on Network Rail that is currently not accounted for.
Question 8: Do you consider that changes in the spectrum environment for the 450 MHz band mean that there is a case for re-examining whether this band should be reconfigured in the UK to align with the harmonised band plan?	Confidential? – Y / N On a point of principle, Network Rail considers that it is appropriate for Ofcom to re-examine whether this band should be reconfigured in the UK to align with the harmonised band plan. We set out the benefits to the UK of aligning with international harmonisation decisions from a railway perspective in our response to Ofcom's recent consultation on 2100 MHz (see answer to Question 11). The development of an equipment ecosystem for the harmonised 450 MHz band plan indicates that there is a case for Ofcom to call for views on the potential efficiencies and supply chain benefits to the UK of alignment. Nonetheless, it is important that Ofcom also considers the potential impact of alignment with international harmonisation on existing licence holders within the band.
Question 9: Do you have any comments on our overview of the 700 MHz band in GB and NI? Please consider the specific factors we have discussed in your response.	Confidential? – N We note that the European Conference of Postal and Telecommunications Administrations (CEPT) has harmonised the frequencies considered in the Call for Input for Public Protection and Disaster Recovery (PPDR). The ECC Decision (16)02 ⁴ describes Public Protection as covering "radiocommunications used by responsible agencies and organisations dealing with maintenance of law and order, protection of life and property, and emergency situations."

¹ Network Rail uses the term "Near Miss" to describe an unsafe event or act specifically involving a Train or On Track Machinery or On Track plant.

² See Network Rail Safety Advice NRA21-06: <u>https://safety.networkrail.co.uk/wp-</u> content/uploads/2021/04/Safety-Advice-NRA21-06-Using-lookout-operated-warning-systems-LOWS.pdf

³ Network Rail's Control Period 6 covers the period from 1 April 2019 to 31 March 2024. Control Period 7 covers 1 April 2024 to 31 March 2029.

⁴ See: <u>ECC Decision (16)02</u>: Harmonised technical conditions and frequency bands for the implementation of broadband public protection and disaster relief systems

	The Call for Input and the government's Wireless Infrastructure Strategy ⁵ recognise the value of aligning with international spectrum frameworks where possible. In light of the ECC Decision, Ofcom's analysis in the Call for Input of the indicative coverage capabilities and the potential bandwidth available, we ask that Ofcom considers whether the PPDR band could provide a suitable alternative to 1900-1910 MHz for the Emergency Service Network's coverage extender gateway.
Question 10: Do you have any comments on our overview of the 800/900 MHz band in NI? Please consider the specific factors we have discussed in your response.	Confidential? – N CEPT ECC Decision (02)05 ⁶ harmonised frequencies in the 900 MHz band for Railway Mobile Radio (RMR) since 2002. The harmonisation of 900 MHz for RMR was affirmed in 2020 by CEPT ECC Decision (20)02 ⁷ . RMR encompasses GSM-R and its successor(s), including the Future Railway Mobile Communication System (FRMCS).
	Network Rail holds the licence for the 900 MHz band in Great Britain for GSM-R. GSM-R, as operated by Network Rail, is a critical operational rail system that supports essential railway signalling and communications throughout Great Britain, in use to control the safe motion and routing of trains and to provide essential communication for railway workers.
	Despite the ongoing success of GSM-R technology within the rail industry, a new successor technology, FRMCS, is in development supported by both the UIC ⁸ and 3GPP ⁹ , to meet the increasing demands of the industry. FRMCS is being designed to support both critical and non-critical operational services in the rail sector.
	One of the fundamental drivers for change is the impending obsolescence of GSM-R equipment. The GSM-R system will become obsolete in the 2035 – 2040 period since suppliers will cease support. The GB rail industry expects to transition from GSM-R to FRMCS over a time-period that may be more than a decade on inclusion of contingency. During migration, Network Rail must maintain, unaffected, the GSM-R critical communication service operating within the 900 MHz band. FRMCS and GSM-R deployments will therefore co-exist for some 10 years.
	Our answer to Question 11 sets out Network Rail's case for additional harmonised spectrum for FRMCS migration and operation. For avoidance of doubt, Network Rail needs to retain its allocated spectrum in the 900 MHz band in Great Britain, in addition to any future allocation by Ofcom of 1900-1910 MHz for RMR. Rail industry demand for data driven services is increasing and both

⁵ See: <u>UK Wireless Infrastructure Strategy</u>

⁶ See: ECC Decision (02)05: "The designation and availability of frequency bands for railway purposes in the 876-880 MHz and 921-925 MHz bands",

⁷ See: <u>https://docdb.cept.org/download/4039</u>

⁸ See: <u>https://uic.org/rail-system/frmcs/</u>

⁹ See: https://www.3gpp.org/

spectrum allocations would be required to provide sufficient capacity for FRMCS use cases that, for example, are reliant on a whole cell requirement for high quality video.¹⁰

Question 11: Do you have any comments on our overview of the 1900 MHz band in GB and NI? Please consider the specific factors we have discussed in your response.

Confidential? – N

Network Rail considers that allocation of 1900-1910 MHz for RMR would make optimal use of this spectrum in Great Britain. Network Rail's response to Ofcom's recent consultation '*Exploring future use* of the unpaired 2100 MHz (1900 - 1920 MHz) spectrum' makes the case for Great Britain's alignment with CEPT ECC Decision (20)02, which has affirmed allocation of the 1900-1910 MHz band for Railway Mobile Radio (RMR) use since 2020. We refer Ofcom to Network Rail's response to the 2100 MHz consultation for a comprehensive overview of the case for allocating this harmonised spectrum to the British rail industry. For ease of reference, the key points are also summarised below.

As noted in our answer to Question 10, the UIC is developing FRMCS as the successor technology to GSM-R. The rail industry now has a clear and pressing need for radio spectrum to support migration from GSM-R to FRMCS and to meet growing industry demand.

The criticality of current GSM-R and future FRMCS RMR systems, as operated by Network Rail, cannot be overstated. These systems support essential railway signalling and communications throughout Great Britain. FRMCS goes further, introducing new capability to support a wide variety of fully digital RMR-focused services. Without reliable and resilient operation of these systems, there is potential for significant harm to the nation's railway workers, passengers, and high value assets. In short, failure (of RMR systems) is not an option.

Regulatory allocation of 1900-1910 MHz for RMR use, taken together with industry alignment on use of FRMCS as a standardsbased successor to GSM-R technology, would mean that cost efficiencies and risk aversions will accrue to the rail industry in Great Britain since access to mainstream solutions will be possible. Without access to the 1900 MHz band, Network Rail would be thrown into unchartered territory and forced to examine niche and unproven future systems, likely to give rise to excessive risk and disproportionately high costs. A further concern is that without 1900 band access, existing GSM-R deployments and operational systems are likely to need reconfigurations which will result in yet more risk and cost impacts. Impact to live GSM-R operations cannot be readily accommodated. Regulatory alignment with the CEPT Decision will provide the British rail industry with the stability that it needs to execute on a complex programme of migration, whilst developing firmly defined strategic plans for future operations.

¹⁰ We note Ofcom's analysis of spectrum requirements for example services at the cell edge. See Call for Input: Annex 7, Table A7.3.