



In this application, Starlink Internet Services Limited (“Starlink”), a subsidiary of SpaceX, is requesting authorization to enhance the connectivity capabilities and capacity at the following four NGSO gateway sites, which are already licensed:

- Fawley (Licence number 1293217)
- Wherstead (Licence number 1293534)
- Woodwalton (Licence number 1293303)
- Isle of Man (Licence number 249304/1)

Specifically, as part of its efforts to meet growing demand for broadband connectivity, Starlink is now requesting to expand the number of gateway antennas at the four sites above to connect to both its first generation (“Gen1”) and second generation (“Gen2”) constellations. The Federal Communications Commission in the United States has authorized Starlink’s Gen1 constellation for 4,408 satellites and the Gen2 constellation for 7,500 satellites. Starlink requests to add an additional 24 gateway antennas to each of the Fawley, Wherstead and Woodwalton sites for a total of 32 antennas at each and an additional 32 gateway antennas to the Isle of Man site for a total of 40 antennas.

By contrast, while SpaceX is committed to growing its investment and infrastructure in the UK, it will also return licences to Ofcom for sites that are no longer suitable. For example, on 5 October 2023, SpaceX surrendered two of its licensed NGSO gateway licences, Bristol (Licence No 1293048/1) and Hoo St. Werburgh (Licence No 1294111/1).

The following information supports Starlink’s request to upgrade each of the sites:

D1. Coexistence with existing systems:

Explain how your non-geostationary earth station(s) (“Gateways”) will be able to coexist with the following:

- Existing non-geostationary satellite systems that are licensed in the UK
- Non-geostationary satellite systems for which an application has been made and which has been published for comment on Ofcom’s website
- Other specific co-frequency earth stations registered with the ITU

and

D2. Coexistence with future systems

State what flexibility your Gateways have to coexist with future non-geostationary satellite systems. You should include measures you would be able to put in place if another non-geostationary satellite system were to enter the market in the future, and the expected benefits of such measures. Also state what measures future non-geostationary satellite systems could reasonably be expected to put in place to coexist with your Gateways.

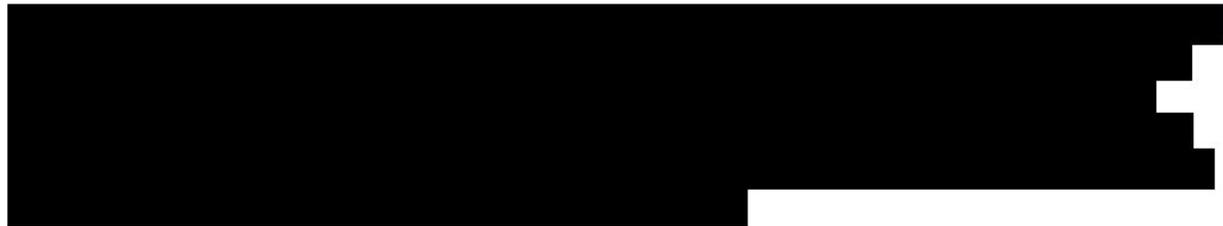
SpaceX currently operates seven gateway sites in the British Isles, located at Morn Hill, Goonhilly, Chalfont, Fawley, Woodwalton, Wherstead and Isle of Man. These sites currently each make use of 8 Ka-band parabolic antennas and serve customers in the UK and the broader region.

Due to growing demand for Starlink’s high-speed, low latency broadband service from households, businesses, and government customers, SpaceX is seeking to collocate additional antennas at four of these gateway sites. These site upgrades will take place at Fawley, Wherstead, Woodwalton, and Isle of Man, and as Starlink explains below, this does not raise any coexistence concerns for existing or future NGSO systems. With regard to currently planned operations listed on the NGSO Licensing page of the Ofcom



website, SpaceX can confirm that this variation will not cause any additional interference into the specific co-frequency Earth Stations. Further, SpaceX confirms that our system is technically capable of complying with the limits in ITU Article 21 and will adhere to these limits. SpaceX has a demonstrated track record of working directly with NGSO operators to coordinate and coexist and will continue to do so with both current and future operators.

SpaceX does not require a standard geographic separation between its gateway earth stations and those of other NGSO systems operating at the same frequencies. Instead, SpaceX undertakes a coordination assessment with each operator, typically based on the specific locations and respective operating parameters of each system, to ensure the shared spectrum is used efficiently and to reduce the possibility of harmful interference.



Moreover, because SpaceX has invested significant resources in designing a system that is flexible and efficiently shares spectrum with other users, the Starlink system can coexist with other non-geostationary satellite gateways in close proximity by leveraging several important design and operational techniques. These techniques, which SpaceX views as fundamental to responsible non-geostationary operations, include:

- directional antennas designed to maximize transmissions towards the SpaceX satellite system and minimize power directed elsewhere;
- multiple beams with very narrow transmit and receive beam widths;
- steerable beams on satellites;
- multiple satellites in view to provide options for gateway links; and
- the use of shielding fences and other physical obstructions (“ground clutter”) that protect adjacent users from potential interference.

With regard to accommodating future operators, Ofcom noted in its Statement granting these licences in November 2022 that it was satisfied “SpaceX has provided the necessary level of detail to reassure us that their network has the necessary flexibility.” SpaceX will continue to operate these upgraded sites in accordance with the original grant from November 2022, which will pose no coexistence concerns for current and future NGSO systems.

D4. Competitive Impact

Explain the impact of issuing you a licence (combined with other non-geostationary satellite system licences held or applied for by you) in terms of:

- Any risks to competition in the UK. This may refer to the ability to coexist with other nongeostationary satellite systems.
- Benefits for UK customers, end consumers and/or citizens.



Collocating additional antennas at these four gateway sites will not harm competition in the UK. Rather, the augmented Starlink system capacity provided by these antennas will enhance the competitive landscape for broadband connectivity, helping to close the digital divide in the UK and in the broader region, especially in reaching those Hardest to Reach Premises.

In its Statement authorising these sites¹, Ofcom examined four potential competition risks: risk of SpaceX occupying all or most of the available sites; risk of SpaceX occupying preferential sites; risk of a requirement for large separation distances between sites; and risk of strategic application to block future entrants. It found no significant competition risks associated with Starlink's application.²

To the extent these risks relate to Starlink operating various gateway sites, Starlink's request raises no competition risk. Granting this request to collocate additional antennas will not add any more sites, and overall, SpaceX will operate two fewer sites in the UK because of the recent surrender of the Bristol and Hoo St. Werberg licences.

SpaceX also sees no risk to current and future satellite operators. SpaceX is already obligated to meet the ITU Radio Regulation Articles 21 and 22 limits to protect GSO networks and will continue to protect them under this framework. And since there will be no harm to current and future NGSO systems, SpaceX does not perceive or foresee any competitive disadvantages to NGSO operators with regards to the additional antennas.

Most notably, these site upgrades will benefit consumers in the UK as they will support additional network capacity in the UK to serve more residential, business, and government customers. The Starlink service already fills a critical gap in the UK connectivity landscape for previously unserved users, providing broadband services that are complementary to those of existing operators that are unable to serve such customers. If granted, this request will support serving even more residential, business, and public spaces.



The upgraded SpaceX sites at Woodwalton, Fawley, Wherstead, and the Isle of Man will also help grow the businesses of, and services provided by, local UK operators by enhancing Starlink's cellular backhaul capabilities and supporting SpaceX's new Direct-to-cell service (pending regulatory approval). These two services will allow customers to access an unprecedented level of connectivity. They will also facilitate partnerships with local operators, allowing existing operators to bolster their connectivity options. More connectivity options will lead to more competitive prices for consumers and will drive businesses to maximize technologic innovation, creating a 'race-to-the-top' effect.



¹ See Starlink Internet Services Limited: Decision on applications for six non-geostationary earth station gateway licences, 10 November 2022 ("Statement").

² See Statement, Section 5.

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

Ultimately, the end result of granting Starlink’s request will be a more competitive landscape for UK consumers and a market that will offer more options for better-quality high-speed broadband services.