

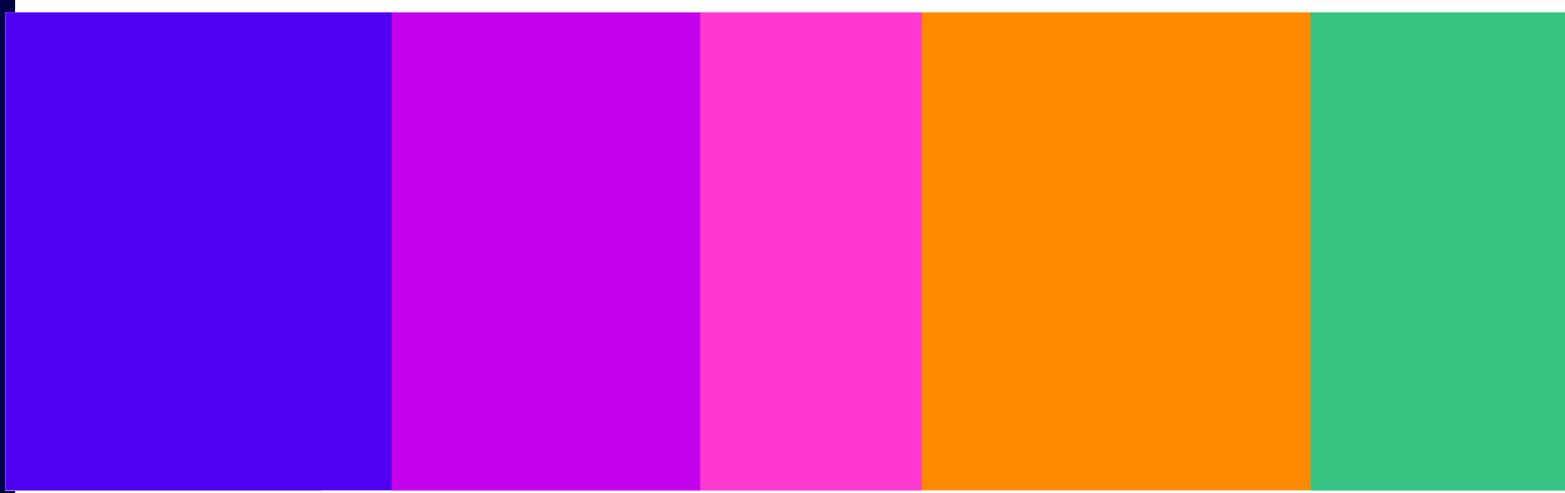
SpaceX application for variation of a non- geostationary gateway licence

Request for comments

Consultation

Published 26 April 2024

Closing date for responses: 31 May 2024



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1. Overview

- 1.1 Non-geostationary orbiting (NGSO) satellite systems are a way of delivering broadband services from space using a constellation of satellites in a low or medium orbit. These systems have the potential to deliver high speed and low latency services.
- 1.2 As set out in our statement on [non-geostationary satellite systems](#), we have a process for considering applications for the following types of spectrum licence:
 - **Satellite (Earth Station Network):** this licence authorises an unlimited number of user terminals to connect to the NGSO system (subject to certain conditions). It also places certain conditions on the licence holder (typically a satellite operator) to coordinate with other licence-holders and protect other spectrum users. We refer to this licence in this document as an "ESN licence".
 - **Satellite (Non-Geostationary Earth Station):** this licence authorises gateway earth stations, which connect the NGSO system to the internet or to a private network. We refer to this licence as an "NGSO gateway licence". It is a condition of this licence that the gateway can only operate to a licenced NGSO system.
- 1.3 Ofcom has received a request from Starlink Internet Services Limited, a subsidiary of SpaceX (hereon referred to as SpaceX) to vary four of its NGSO gateway licences. Details of this application (ref: SpaceX-Gateway2) can be found under the "Applications received" in the NGSO section of our website.
- 1.4 SpaceX¹ proposes to expand the number of antennas hosted at these sites. Their application requests we authorise the use of:
 - a) an additional 24 antennas at Fawley, Wherstead and Woodwalton, bringing the total number of antennas at each of those sites to 32.
 - b) an additional 32 antennas at its Isle of Man site, bringing the total there to 40.
- 1.5 When considering applications or variation requests for these licences, amongst other considerations, we will take account of their impact on technical coexistence and competition.
- 1.6 We are publishing this document to invite comments on the application and on our preliminary views. We will take into account all comments received and we are open to changing those views depending on responses and evidence submitted to us as part of this process.
- 1.7 Further information which explains the context and reason for this process and how to respond to licence applications can be found in our earlier statement on non-geostationary satellite earth stations licence guidance.

¹ The variation requests submitted by SpaceX (the parent company) are actually made in the name of Starlink Internet Services Ltd (the subsidiary which operates the Starlink satellite service). However, the company uses both names in the text it has submitted in support of the application. For that reason, the terms SpaceX and Starlink should be considered as interchangeable throughout this document.

What we are proposing – in brief

This document sets out Ofcom's initial assessment of SpaceX's request to vary four of its NGSO gateway licences to increase the number of antennas, and our proposal to grant the variation on the basis of this assessment.

Our initial assessment is that SpaceX's requested variation should not unduly affect other licenced NGSO services, future NGSO services, GSO services or Fixed links operating in the same user frequencies.

We will take into account all comments received, and we are open to changing our views depending on responses and any evidence submitted to us as part of this process.

The closing date for submission of responses is 31 May 2024.

2. Application for licence variation

Background

- 2.1 SpaceX applied for an Earth Station Network licence to operate its Starlink Gen1 constellation (comprising some 4,408 satellites) in the UK in 2019. Two gateway licences were applied for in 2020 at existing teleports operated by other companies. These were at Chalfont and Goonhilly; SpaceX also applied for a gateway licence at the Isle of Man and Morn Hill in 2021 (see table 3 below).
- 2.2 In May 2022 SpaceX used our new NGSO licencing process to submit applications for NGSO Gateway licences to operate a further six sites at Bristol, Fawley, Hoo St Werburgh, Morn Hill, Wherstead and Woodwalton.
- 2.3 Our decision to grant the application was set out in a [statement](#) published in November 2022. Starlink subsequently decided to surrender the licences for two sites (Bristol and Hoo St Werburgh) in October 2023.
- 2.4 The 2024 SpaceX request for licence variation cites growing demand for the Starlink high-speed, low latency broadband service from households, businesses, and government customers.

Licence variations

Process for considering licence variation

- 2.5 In line with our [Licensing Guidance](#), we review applications for licence variation on a case-by-case basis. If we feel the proposed modification could materially impact the interference environment for other operators, we reserve the right to request the operator to submit a full application.
- 2.6 As set out in their application:

[“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”.](#)
- 2.7 We assess that the proposed overall increase in antennas to serve the Gen 2 Starlink constellation could potentially introduce a change to the interference environment. This is because such an increase could allow SpaceX to connect more satellites simultaneously to those locations, potentially resulting in higher transmitted and received power levels at those locations.
- 2.8 For that reason, we have asked SpaceX to submit this variation request. This is both for transparency and for us to gather further evidence regarding the potential impact of the proposed changes before taking our final decision.

Request to increase the number of antennas at four gateway sites and add new frequencies.

- 2.9 SpaceX is requesting a variation to the Starlink gateway licences for four of its remaining seven sites – Fawley (licence number 1293217), Isle of Man (licence number 249304/1), Wherstead (licence number 1293534) and Woodwalton (licence number 1293303).
- 2.10 These gateway sites are currently authorised to operate up to 9 Ka-band parabolic antennas; they serve customers in the UK and adjacent countries.
- 2.11 At three of those locations (Fawley, Wherstead and Woodwalton) SpaceX is applying to add an additional 24 gateway antennas, operating a total of 32 antennas at each of those sites. It plans to operate these antennas in the bands: 27.5-28.0525 GHz, 28.4445-29.0605 GHz, 29.4525-30GHz.²
- 2.12 At the Isle of Man site it is looking to operate an additional 32 antennas, bringing the total to 40. SpaceX already has access to all the frequencies it wishes to use (27.5-30GHz) at the Isle of Man.

Current NGSO licence holders and applicants

- 2.13 We ask operators to cooperate with all co-frequency licence holders and in our assessment consider whether the applicant can coexist with both current and future systems.
- 2.14 At the time of writing, Starlink is the only NGSO system which has deployed equipment and is using Ka band to provide a service in the UK.
- 2.15 Three of the licenced NGSO satellite operators plan to operate Ka band terminals (see table 1 below) and one of the two applications currently under consideration for ESN licences (Beetlesat) also plans to operate terminals in Ka band (see table 2 below)³.
- 2.16 All the NGSO gateway earth stations in the UK connect to the Starlink service, although some licences are held by the Teleport operator (see table 3 below).
- 2.17 The tables below are correct at the time of publication. Up to date details of all current licences can be found on the NGSO page of our [website](#).

² This frequency range includes additional gateway spectrum that was added to the gateway licences in March 2024. Starlink gateways are capable of operating in all frequencies in the range 27.5-30GHz but some of these frequencies were auctioned in [2000 and 2008](#). The NGSO gateway licence does not authorise use of these frequencies but gateways such as those operated by SpaceX may operate in additional 28GHz frequencies, subject to commercial agreements with the relevant 28GHz licence holder.

³ The Earth Station Network licences permit use of the Ku band (14.0–14.5 GHz) and the Ka band frequencies used by Starlink. We have indicated in the table which frequency bands the operators plan to use for terminals connecting to their constellations.

Table 1: Existing NGSO Earth Station Network licence holders and terminal frequency bands

NGSO ESN licence holders	Terminal frequency band
Mangata Edge Ltd	Ka band
Telesat LEO Inc	Ka band
Starlink Internet Services Limited (a subsidiary of SpaceX)	Ku band
Network Access Associates Ltd (a subsidiary of OneWeb)	Ku band
Rivada	Ka band

Table 2: Pending NGSO Earth Station Network licence applications

NGSO ESN Applicants	Terminal frequency band
NSLComm Ltd Beetlesat	Ka band
Kepler Communications Inx	Ku band
Inmarsat GX-10	Ka band

Table 3: Existing NGSO Earth Station (Gateway) licence holders and frequency bands

NGSO Gateway licence holders	Location	Gateway frequency band
Starlink Internet Services Limited	Fawley	Ka band
Starlink Internet Services Limited	Morn Hill	Ka band
Starlink Internet Services Limited	Wherstead	Ka band
Starlink Internet Services Limited	Woodwalton	Ka band
Arqiva Ltd	Chalfont	Ka band
Goonhilly Earth Station Limited	Goonhilly	Ka band
Starlink Internet Services UK Limited	Isle of Man	Ka band

Coexistence assessment

- 2.18 When issuing new licences, one of Ofcom’s objectives is that all authorised systems are capable of coexisting (in bands they are using in common), such that they are all able to provide services to their users without experiencing harmful interference.
- 2.19 When applying for a licence or a licence variation, we ask applicants to demonstrate:
- a) Coexistence with other NGSO systems: applicants should demonstrate how coexistence is possible between their networks:
 - i) existing NGSO systems that are already licensed in the UK;
 - ii) NGSO systems that have applied for a licence and whose application has been published for comment; and
 - iii) other specific co-frequency earth stations registered with the ITU.
 - b) Ability to coexist with future NGSO systems: applicants should state what flexibility their system has to achieve coexistence with future networks. This could include the measures they would be able to put in place if another network comes along in the future; it could also suggest measures future networks could reasonably be expected to put in place in order to coexist.
- 2.20 The NGSO Earth Station Network licence and the NGSO Gateway licence are both needed to govern the operation of the gateway and ensure it protects other users of the spectrum, and together impose conditions on the operation of the whole system.
- 2.21 The SpaceX application for a licence variation cites growing demand for the Starlink high-speed, low latency broadband service from households, businesses, and government customers. To address this demand, SpaceX says it will require additional capacity at Fawley, Isle of Man, Wherstead, and Woodwalton, and considers that this will pose no coexistence concerns.
- 2.22 Our decision on whether or not to grant the variation request will determine whether Starlink can increase the number of antennas operating at the relevant gateway sites, and hence how many of the Starlink satellites can communicate with UK-located gateways, and the number of Ka beams directed at the locations of such gateways.

Coexistence with existing systems

- 2.23 Our criteria for assessing coexistence with existing NGSO systems is set out in the NGSO Licensing Guidance document. The licensing framework states that bilateral cooperation is the preferred way to achieve an efficient use of spectrum, and we do not set specific fall-back conditions.
- 2.24 Our expectation is that all operators coordinate in good faith. However, our licensing conditions give us powers to enforce against licensees who refuse to coordinate in good faith and who cause harmful interference to others.
- 2.25 SpaceX has stated that:

“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.”

- 2.26 It has also provided us with a confidential update on coordination agreements and ongoing discussions with existing licence holders.
- 2.27 Specifically in regard to its gateways, SpaceX says its system:
- “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”.
- 2.28 Furthermore, in relation to specific co-located earth stations and their application for a variation, Starlink stated that:
- “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”.
- 2.29 Given the information provided, our preliminary assessment is that the increase in antennas at several sites, and the corresponding increase in the number of beams pointing at those sites, should not have a negative impact on existing NGSO operators. Starlink have provided us with an update of their ongoing coordination agreements and they can be expected to have the technical capabilities to mitigate interference to other NGSO systems.

Coexistence with future systems

- 2.30 As outlined in our Statement on Updates to NGSO Licensing, we want to enable as many NGSO systems as possible, to provide services and increase choice for people and businesses in the UK. We therefore anticipate additional applications for NGSO gateways in the future to support other NGSO systems in the UK.
- 2.31 Although we do not expect licensees to foresee the characteristics or the number of future systems that will apply for a licence in the UK, we request that applicants:
- a) explain how their existing network design and operating model might facilitate coexistence with other NGSO satellite systems and any limitations to their systems; and
 - b) outline any additional measures which would allow improved coexistence with other systems.
- 2.32 We also request applicants to be aware that they may be expected to take reasonable measures to accommodate such future systems (in order to avoid material degradation to either service).
- 2.33 SpaceX says it has invested significant resources in designing a system that is flexible and can coexist with other non-geostationary satellite gateways in close proximity by leveraging its design and operational techniques. These techniques include:
- a) directional antennas designed to maximize transmissions towards its satellite system and minimize power directed elsewhere;
 - b) multiple beams with very narrow transmit and receive beam widths;
 - c) steerable beams on satellites;
 - d) multiple satellites in view to provide options for gateway links; and

- e) the use of shielding fences and other physical obstructions ('ground clutter') that protect adjacent users from potential interference.
- 2.34 SpaceX notes that our statement granting the original licence applications in November 2022 said we were satisfied that *"SpaceX has provided the necessary level of detail to reassure us that their network has the necessary flexibility."*
- 2.35 Starlink is currently the only NGSO operator to have gateways in the UK. As stated in paragraph 2.27, SpaceX's application confirms its gateways do not require a geographic separation with other gateways, so SpaceX's sites should not restrict the choice of location for future gateways in the UK.
- 2.36 Our initial conclusions are that SpaceX's Starlink constellation continues to have the necessary flexibility to accommodate future NGSO services and that its plans to extend four gateways should not unduly affect future licensees.

Our initial assessment on coexistence with existing and future NGSO systems

- 2.37 Our initial view is that SpaceX has provided the necessary evidence to reassure us that they intend to cooperate with other NGSO licensees and that their system has the necessary flexibility to coexist with current and future licensees.
- 2.38 We reiterate SpaceX's obligation to keep engaging in coordination discussions in good faith to ensure coexistence with other NGSO licensees.

Consultation question 1:

Do you anticipate this licence variation will pose coexistence challenges to existing NGSO services?

Consultation question 2:

Are the measures set out by the applicant to enable coexistence with future NGSO systems reasonable?

Impact on other services

- 2.39 During the consultation process on the SpaceX gateway application in 2022, several stakeholders raised concerns regarding the potential impact of the SpaceX NGSO constellation on other services such as GSO satellite systems.
- 2.40 In our 2023 statement on [Satellite Earth Station Network Licences](#), we introduced explicit conditions in our ESN licences that require licensees to respect the relevant limits in Article 21 and Article 22 of the ITU Radio Regulations, as well as to protect radio astronomy services in the relevant frequency bands -see item D4 in the licence application form.
- 2.41 These obligations are placed on the ESN licence rather than gateway licences but, noting the concerns raised in response to its previous gateway application regarding e.g. the protection of GSO services, and that Starlink also holds an ESN licence, we have considered them as part of our initial assessment.
- 2.42 In our statement of November 2022, we said we were satisfied that Starlink would be able to protect GSO networks. We have assessed whether this conclusion might change as a result of adding more antennas to some gateway locations. We have also assessed whether

the proposed increase in the number of antennas could negatively impact fixed links operating in Ka band.

Protection of GSO networks

2.43 Regarding the protection of GSO networks, SpaceX has stated that:

“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”.

Initial Assessment

- 2.44 Regardless of the number of antennas in one site, or of the number of beams pointing from satellites to that site, it is reasonable for us to expect that Starlink will comply with the limits in Article 22 of the ITU Radio Regulations (and it is the responsibility of the administrations holding its satellite filings to ensure it does so).
- 2.45 While SpaceX has not provided specific technical analysis to demonstrate that the additional antennas would not adversely affect GSO operators, we note that they have recognised their international obligations in their application.
- 2.46 Our initial assessment is therefore that the inclusion of more antennas at each gateway should not have an impact on Starlink’s international obligations to protect GSO networks, or its ability to do so.
- 2.47 In addition, it is a condition of the NGSO gateway licence that authorised gateways may only operate to licenced satellite networks, authorised under a NGSO network licence. New terms which we introduced in the [Earth Station Network licence in 2023](#) also require SpaceX to comply with Article 22 of the ITU Radio Regulations and give us the ability to act swiftly to resolve any issues should harmful interference to GSO systems occur.

Collective obligations for NGSO operators ensuring protection of GSO networks

- 2.48 It is worth noting that Resolution 76 was updated at WRC-23, resolving that administrations responsible for NGSO systems will hold consultation meetings regularly to ensure compliance with the existing aggregate limits for the protection of GSO networks.
- 2.49 While SpaceX is the only NGSO service operating in Ka band in the UK at the time of writing, as Table 1 indicates, other services intend to commence services in the next two years and we therefore expect all licenced NGSO operators using the same frequencies to cooperate in order to meet the aggregate interference limits set out in Resolution 76.

Protection of the fixed service

2.50 As set out in para 2.42, SpaceX has confirmed that their system is technically capable of complying with the Article 21 limits and will adhere to these limits.

Initial Assessment

- 2.51 While SpaceX has not provided specific technical analysis to demonstrate that the additional antennas would not adversely affect fixed links, we note that they have recognised their international obligations in their applications.
- 2.52 Our initial view is that Starlink system will be able to protect fixed links.

- 2.53 It is a condition of the NGSO gateways can only operate to licenced satellite networks. New terms which we introduced in the [Earth Station Network licence in 2023](#) also require SpaceX to comply with Article 21 of the ITU Radio Regulations and give us the ability to act swiftly to resolve any issues should harmful interference to GSO systems occur.

Conclusion

- 2.54 Our initial view is the SpaceX's proposed variation should not unduly affect existing users. SpaceX has provided reassurances to that effect and we can take action should harmful interference occur.

Impact on competition

- 2.55 As part of our licencing process, we perform a competition check to ensure that granting a licence is unlikely to adversely affect current or future competition in the UK. Our starting point is to authorise applications, where possible.
- 2.56 In our November 2022 decision to grant SpaceX licences to operate six additional gateways in the UK we considered a range of potential impacts on competition, and our overall assessment was that there was a low risk to competition from granting the licences. Our competition assessment in this consultation compares the facts of the current application against the facts in the November 2022 decision and considers the same issues.

SpaceX submitted an assessment of the impact of granting the licence variations on competition.

- 2.57 In its application for the new licence variations, it says that granting the request to co-locate additional antennas at Fawley, Isle of Man, Wherstead and Woodwalton will not add any more sites and that, overall, SpaceX will actually operate two fewer sites in the UK compared to the application we approved in November 2022, because of the surrender of the Bristol and Hoo licences. It sees no risk to current and future satellite operators.

“SpaceX does not perceive or foresee any competitive disadvantages to NGSO operators with regards to the additional antennas.”

- 2.58 It says the addition of 28 GHz band frequencies to already-existing gateway sites will not have any preclusive effect on future entrants to the market as it is a small segment of spectrum adjacent to other frequencies already being used.
- 2.59 Overall, it says the augmented Starlink capacity provided by additional antennas and spectrum will enhance the competitive landscape for broadband connectivity in the UK and help to close the digital divide, including by reaching ‘hardest-to-reach’ premises.

“The Starlink service already fills a critical gap in the UK connectivity landscape for previously unserved users, providing broadband services that are complimentary 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.”

Initial assessment

2.60 In our November 2022 decision statement, we considered four potential competition risks in respect to the six gateways in the Starlink licence application:

- The risk of SpaceX occupying all or most of the available gateway earth station sites, potentially blocking future entrants from accessing the market.
- The risk of SpaceX occupying preferential sites, raising the cost of entry to subsequent entrants.
- The risk of SpaceX's potential requirement for large separation distances between its gateway earth station(s) and that of others, thereby blocking potential sites to future entrants.
- The risk of strategic licence application for gateway earth station sites which an operator does not plan to use, in order to deliberately block future entrants.

2.61 At the time, we found no significant competition risks associated with Starlink's application.

2.62 We have now considered whether Starlink's new application changes our assessment of the risks outlined in our original decision.

Risk of SpaceX occupying all or most of the available gateway earth station sites, potentially blocking future entrants from accessing the market

2.63 There is no change to this risk assessment since Starlink is not proposing to occupy any new sites. In fact, Starlink will be operating two fewer sites in the UK because of its surrender of the Bristol and Hoo licences.

2.64 Nevertheless, we consider there is a large number of alternative sites for other operators to develop, should they wish.

Risk of SpaceX occupying preferential sites, raising the cost of entry to subsequent entrants

2.65 There is no change to this risk assessment since Starlink is not proposing to occupy any new sites and has surrendered two sites compared to the original decision.

Risk of SpaceX's potential requirement for large separation distances between its gateway earth station(s) and that of others, thereby blocking potential sites to future entrants

2.66 As we explain above, Starlink has informed us that its system does not require a standard geographic separation between its gateway earth stations and those of other NGSO systems operating at the same frequencies. Instead, it undertakes a coordination assessment with each operator. This ensures the shared spectrum is used efficiently and the possibility of harmful interference is reduced. As such, our original conclusion of no concern remains valid.

Risk of strategic licence application for gateway earth station sites which an operator does not plan to use, in order to deliberately block future entrants

2.67 There is no change to this risk assessment since Starlink is not proposing to occupy any new sites, and has surrendered two sites compared to the original decision.

2.68 Our original decision addressed two other risks to competition. These fell into two broad categories: (a) a broader concern over the global number of satellites in space and foreclosure of other satellite operators, and (b) concerns related to SpaceX's vertically integrated satellite launch and satellite broadband businesses. We address any potential changes to our original assessment of these risks below.

Global number of satellites and foreclosure in space

- 2.69 Some respondents to our June 2022 consultation suggested that the planned global expansion of the SpaceX system (via its Gen 2 configuration) would substantially increase the number of satellites operating in space. These respondents stated that the impact of such a global expansion could be to prevent potential entrants deploying smaller, lower priority constellations in space in the future. This would be because these new entrants may not be able to protect or operate around such a large constellation.
- 2.70 Some respondents also said that the size of the expanded constellation would mean it may be difficult to access certain orbital resources which SpaceX plans to use for their Gen 2 configuration. Taken in combination with challenges around scarce and shared spectrum, one respondent's view was that the planned global expansion of satellites by SpaceX could foreclose other satellite operators.
- 2.71 We concluded, in our November 2022 decision, that granting gateway licences in the UK was unlikely to materially affect the number of satellites launched globally by SpaceX, and therefore would not affect competition in the manner suggested by some respondents.
- 2.72 In line with our original decision, we assess the potential effect on competition to supply satellite broadband to UK customers from approving this application for a licence variation.
- 2.73 For the new application to raise competition concerns in the UK, it would need to be the case that:
- a) granting this licence to SpaceX drives the deployment of a sufficient proportion of SpaceX's Gen 2 system, and
 - b) this deployment leads to harm to competition in the UK.
- 2.74 On (a), our position remains the same. That is, we continue to believe that our decision is unlikely to materially impact on SpaceX's decision to launch satellites.
- i) First, SpaceX has already deployed more satellites without having additional antennas in the UK. SpaceX's Gen 2 satellite constellation is designed to meet global demand, with Earth-based stations being used to connect at a local level. SpaceX told us that ~~✗~~ They claimed that ~~✗~~. Therefore, we remain of the view that satellite constellations drive the demand for gateways, rather than the other way around. Accordingly, granting or declining this new application is unlikely to materially affect the number of satellite launches by SpaceX.
 - ii) Second, if we were to decline this new application, SpaceX could deliver additional capacity on the ground by deploying gateways in neighbouring countries. As above, in this counterfactual the number of satellites in space is unlikely to materially change. However, declining this application could preclude UK consumers from realising some benefits associated with having ground capacity in the UK, such as improved latency.

- 2.75 Our position on (a) remains the same, i.e. we continue to believe that our decision is unlikely to materially impact on SpaceX's decision to launch satellites. Given this, we do not need to consider (b), i.e. whether this deployment leads to harm to competition in the UK. Nonetheless, we note that a larger deployment of satellites does not necessarily lead to a harm to competition in the UK.
- 2.76 Our provisional view is, therefore, that granting the new application is unlikely to make a material difference to competition in the UK through the theoretical mechanism of potential foreclosure in space from satellite proliferation and reduced access to orbital resources.

SpaceX's vertically integrated business

- 2.77 Our November 2022 decision discussed the potential risks around granting gateway licences to a firm that was active in both the supply of satellite launch services and the supply of broadband services (i.e. SpaceX is 'vertically integrated').
- 2.78 In the original decision we noted that vertical integration can result in efficiencies and can, in some cases, be viewed as beneficial for competition and therefore beneficial for consumers in the UK. These efficiencies can include reduced costs, and lead to improvements to product or service quality.
- 2.79 However, we also recognised there is at least a theoretical possibility that SpaceX's vertical integration could affect competition in the supply of satellite broadband to UK customers. For completeness, we assessed potential harm to competition from 'input foreclosure'. Input foreclosure refers to a situation where an upstream division of a vertically integrated firm either stops supplying inputs to rivals of its own downstream division or continues to supply the inputs but at higher prices.⁴
- 2.80 We concluded that there was no realistic prospect that granting the six gateway licences would increase the likelihood of SpaceX engaging in input foreclosure.
- 2.81 We reassess this risk in light of the new application. The specific hypothetical concern in this case is that the new application represents an intent to expand SpaceX's UK presence i.e. serve more UK customers. This might increase the incentive to engage in input foreclosure.
- 2.82 The standard assessment of input foreclosure follows a three-part framework, which asks whether:⁵
- a) a firm would have the ability to use its control of inputs to harm the competitiveness of its downstream rivals;
 - b) a firm would have the incentive to actually do so, i.e. it would be profitable; and
 - c) the foreclosure of these rivals substantially lessens overall competition.
- 2.83 The tests are cumulative. That is, all must be met for there to be a competition concern.
- 2.84 For SpaceX to have the ability to foreclose rivals it would need to have upstream market power and the input (satellite launches) must be important to downstream rivals' ability to provide services to their customers. While satellite launches are certainly important for commercial satellite operators (i.e. rivals to Starlink), our current understanding is that SpaceX has already provided (or is contracted to provide) launch services for a number of its

⁴ In this case, upstream division refers to satellite launches while downstream division refers to the provision of satellite broadband.

⁵ See CMA merger assessment guidelines: [Merger Assessment Guidelines \(CMA129\) - GOV.UK \(www.gov.uk\)](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/101212/Merger_Assessment_Guidelines_CMA129.pdf)

competitors – including those NGSO operators wishing to provide a service in the UK⁶ - and that other launch operators such as Arianespace, ILS, Indian Space Research Organisation’s Polar Satellite Launch Vehicle and Rocket Lab are credible alternative launch providers for third parties (although we understand that none currently have a launch frequency that is comparable with that of SpaceX). We also understand that there is a range of future competitors, such as ABL and UK companies such as Skyrora and Orbex.

- 2.85 On the potential incentive for SpaceX to engage in input foreclosure, we do not consider this would materially change if we granted the licences. First, and as explained above, in the counterfactual of denying the application we consider that SpaceX could take alternative steps to meet its capacity needs, such as by building gateways in neighbouring countries. As a result, the incentive is unlikely to change depending on our licencing decision. Second, the additional incentive from a larger presence in the UK from the application being granted is likely to be small when compared against the potential ‘cost’ of such a strategy, which is the loss of global sales of satellite launches to its downstream rivals.
- 2.86 We have not concluded on whether SpaceX does not or does not currently have the ability to engage in foreclosure (whether total or partial). However, we believe that granting this application would not change SpaceX’s incentive to engage in input foreclosure.
- 2.87 Therefore, our initial assessment of Starlink’s new application is that there is a low competition risk.

Benefits

- 2.88 Starlink maintains that that the addition of 24 antennas at the three separate gateway sites on mainland UK and a further 32 antennas at the Isle of Man site will benefit consumers in the UK. It says:
- “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”.
- 2.89 It says 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.”

⁶ [OneWeb confirms successful deployment of 40 satellites launched with SpaceX](#)
[Telesat buys SpaceX launches for Lightspeed internet satellites \(msn.com\);](#)
[The OuterNET — Rivada \(rivadaspace.com\);](#)
[NSLComm’s BeetleSat LEO Satellite Successfully Launched via SpaceX Falcon 9 Rocket - Beetlesat;](#)
[Kepler Communications Selects SpaceX to Launch Two Batches of its Nanosatellite Constellation – Kepler](#)

2.90 It adds:

“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 technological innovation, creating a ‘race-to-the-top’ effect.”

2.91 Our preliminary view is that granting this licence variation would increase the availability of high-quality broadband services, which would be beneficial for UK consumers.

Consultation question 3:

Do you expect that granting this variation request would adversely affect competition? If so, please explain why.

Additional concerns

2.92 Coexistence and competition are the two issues on which we expect to make our licensing decisions (as set out in the NGSO Licensing updates Statement).

Consultation question 4:

Do you have any additional concerns or comments regarding the variation request?

Equality and Welsh language impact assessment

2.93 We have included a summary of our approach to impact assessments in Annex A1, together with an Equality impact assessment and Welsh language impact assessment.

2.94 We consider that the proposed variation is likely to have a particularly positive impacts on groups of persons living in more rural or remote areas including in Scotland, Wales and Northern Ireland and improve equality of opportunity in those areas. We have not identified any adverse impacts on specific groups of persons that are likely to be affected in a different way to the general population.

Consultation Question 5:

Do you agree with our assessment of the potential impact on specific groups of persons?

- 2.95 Our proposals to grant the licence should improve broadband delivery for UK consumers and we do not therefore consider our proposals have any impact on our Welsh language obligations. Our proposal also related to a nationwide licensing regime and the relevant licence products are available for anyone within the UK to apply.

Consultation Question 6:

Do you agree with our assessment of the potential impact of our proposal on the Welsh language?

Proposal to vary SpaceX's NGSO gateway licence

- 2.96 Taking account of the evidence presented by SpaceX and our assessment of the risks and benefits, we propose to grant SpaceX's requested variation.

3. Next Steps

- 3.1 NGSO licence applications and applications for variations are available on the Apply for [NGSO licence section of our website](#), under “Applications received for NGSO Earth Station (Gateway) licences”.
- 3.2 We welcome comments on SpaceX’s variation. Responses should be submitted electronically to ngso.licensing@ofcom.org.uk by 31 May 2024.
- 3.3 We will review and consider responses carefully before making a final decision. Our decision will be published on our website.
- 3.4 If the variation request is granted, updated licences will be published on the website under “existing NGSO gateway earth station licences” in due course.

A1. Impact assessments

- A1.1 Section 7 of the Communications Act 2003 (the Act) requires us to carry out and publish an assessment of the likely impact of implementing a proposal which would be likely to have a significant impact on businesses or the general public, or when there is a major change in Ofcom’s activities. Section 4 of our statement on non-geostationary satellite systems also sets out how we assess the impact of applications for Non-Geostationary Earth Stations.
- A1.2 More generally, impact assessments form part of good policy making and we therefore expect to carry them out in relation to a large majority of our proposals. We use impact assessments to help us understand and assess the potential impact of our policy decisions before we make them. They also help us explain the policy decisions we have decided to take and why we consider those decisions best fulfil our applicable duties and objectives in the least intrusive way. Our impact assessment guidance sets out our general approach to how we assess and present the impact of our proposed decisions.
- A1.3 Our preliminary view is that granting a licence variation to SpaceX system has the potential to provide services that provide further connectivity options to customers in the UK and will result in overall benefits to consumers and citizens. We assess the likely impact of granting the licence more fully in Section 2 above, in relation to potential impacts on coexistence and competition.

Equality impact assessment

- A1.4 We have given careful consideration to whether our proposal will have a particular impact on persons sharing protected characteristics (broadly including race, age, disability, sex, sexual orientation, gender reassignment, pregnancy and maternity, marriage and civil partnership and religion or belief in the UK and also dependents and political opinion in Northern Ireland), and in particular whether they may discriminate against such persons or impact on equality of opportunity or good relations. This assessment helps us comply with our duties under the Equality Act 2010 and the Northern Ireland Act 1998.3
- A1.5 When thinking about equality we think more broadly than persons that share protected characteristics identified in equalities legislation and think about potential impacts on various groups of persons (see paragraph 4.7 of our impact assessment guidance).
- A1.6 In particular, section 3(4) of the Act also requires us to have regard to the needs and interests of specific groups of persons when performing our duties, as appear to us to be relevant in the circumstances. These include:
- a) the vulnerability of children and of others whose circumstances appear to us to put them in need of special protection;
 - b) the needs of persons with disabilities, older persons and persons on low incomes; and
 - c) the different interests of persons in the different parts of the UK, of the different ethnic communities within the UK and of persons living in rural and in urban areas.

- A1.7 Further detail is set out in section 149 of the Equality Act 2010 and section 75 of the Northern Ireland Act 1998. 14 A1.5 We examine the potential impact our policy is likely to have on people, depending on their personal circumstances. This also assists us in making sure that we are meeting our principal duty of furthering the interests of citizens and consumers, regardless of their background and identity.
- A1.8 By proposing to vary the licence and thereby facilitate further access to broadband via satellite, we consider that our proposals are likely to have a particularly positive impacts on groups of persons living in more rural or remote areas including in Scotland, Wales and Northern Ireland and improve equality of opportunity in those areas. We have not identified any adverse impacts on specific groups of persons that are likely to be affected in a different way to the general population.

Welsh language impact assessment

- A1.9 The Welsh Language (Wales) Measure 2011 made the Welsh language an officially recognised language in Wales. Ofcom is required to take Welsh language considerations into account when formulating, reviewing or revising policies which are relevant to Wales (including proposals which are not targeted at Wales specifically but are of interest across the UK).⁴
- A1.10 Where the Welsh Language Standards are engaged, we consider the potential impact of a policy proposal on (i) opportunities for persons to use the Welsh language; and (ii) treating the Welsh language no less favourably than the English language. We also consider how a proposal could be formulated so as to have, or increase, a positive impact, or not to have adverse effects or to decrease any adverse effects.
- A1.11 Our proposals to grant the licence should improve broadband delivery for consumers living in specific areas and we do not therefore consider our proposals have any impact on our Welsh language obligations. Our proposal also related to a nationwide licensing regime and the relevant licence products are available for anyone within the UK to apply.
- A1.12 We note that Ofcom's current practice is to offer to produce spectrum licences in Welsh, and when requested does provide licences in Welsh, in accordance with its obligations set by the Welsh Language Commissioner. Ofcom will continue to take this approach in the future in relation to spectrum licences.

A2. Responding to this consultation

How to respond

- A2.1 Ofcom would like to receive views and comments on the issues raised in this document, by 5pm on 31 May 2024.
- A2.2 You can download a response form from www.ofcom.org.uk/consultations-and-statements/category-3/spacex-application-variation-non-geostationary-gateway-licence. You can return this by email or post to the address provided in the response form.
- A2.3 If your response is a large file, or has supporting charts, tables or other data, please email it to ngso.licensing@ofcom.org.uk, as an attachment in Microsoft Word format, together with the cover sheet.
- A2.4 Responses may alternatively be posted to the address below, marked with the title of the consultation:
- NGSO Team,
Riverside House
2A Southwark Bridge Road
London SE1 9HA
- A2.5 We welcome responses in formats other than print, for example an audio recording or a British Sign Language video. To respond in BSL:
- send us a recording of you signing your response. This should be no longer than 5 minutes. Suitable file formats are DVDs, wmv or QuickTime files; or
 - upload a video of you signing your response directly to YouTube (or another hosting site) and send us the link.
- A2.6 We will publish a transcript of any audio or video responses we receive (unless your response is confidential).
- A2.7 We do not need a paper copy of your response as well as an electronic version. We will acknowledge receipt of a response submitted to us by email.
- A2.8 You do not have to answer all the questions in the consultation if you do not have a view; a short response on just one point is fine. We also welcome joint responses.
- A2.9 It would be helpful if your response could include direct answers to the questions asked in the consultation document. The questions are listed at Annex 4. It would also help if you could explain why you hold your views, and what you think the effect of Ofcom's proposals would be.
- A2.10 If you want to discuss the issues and questions raised in this consultation, please email us at ngso.licensing@ofcom.org.uk.

Confidentiality

- A2.11 Consultations are more effective if we publish the responses before the consultation period closes. This can help people and organisations with limited resources or familiarity with the issues to respond in a more informed way. So, in the interests of transparency and good regulatory practice, and because we believe it is important that everyone who is interested in an issue can see other respondents' views, we usually publish responses on the Ofcom website at regular intervals during and after the consultation period.
- A2.12 If you think your response should be kept confidential, please specify which part(s) this applies to and explain why. Please send any confidential sections as a separate annex. If you want your name, address, other contact details or job title to remain confidential, please provide them only in the cover sheet, so that we do not have to edit your response.
- A2.13 If someone asks us to keep part or all of a response confidential, we will treat this request seriously and try to respect it. But sometimes we will need to publish all responses, including those that are marked as confidential, in order to meet legal obligations.
- A2.14 To fulfil our pre-disclosure duty, we may share a copy of your response with the relevant government department before we publish it on our website.
- A2.15 Please also note that copyright and all other intellectual property in responses will be assumed to be licensed to Ofcom to use. Ofcom's intellectual property rights are explained further in our Terms of Use.

Next steps

- A2.16 Following this consultation period, Ofcom plans to publish a statement.
- A2.17 If you wish, you can register to receive email updates alerting you to new Ofcom publications.

Ofcom's consultation processes

- A2.18 Ofcom aims to make responding to a consultation as easy as possible. For more information, please see our consultation principles in Annex A3.
- A2.19 If you have any comments or suggestions on how we manage our consultations, please email us at consult@ofcom.org.uk. We particularly welcome ideas on how Ofcom could more effectively seek the views of groups or individuals, such as small businesses and residential consumers, who are less likely to give their opinions through a formal consultation.
- A2.20 If you would like to discuss these issues, or Ofcom's consultation processes more generally, please contact the corporation secretary:
- A2.21 Corporation Secretary
Ofcom
Riverside House
2a Southwark Bridge Road
London SE1 9HA
Email: corporationsecretary@ofcom.org.uk

A3. Ofcom's consultation principles

Ofcom has seven principles that it follows for every public written consultation:

Before the consultation

A3.1 Wherever possible, we will hold informal talks with people and organisations before announcing a big consultation, to find out whether we are thinking along the right lines. If we do not have enough time to do this, we will hold an open meeting to explain our proposals, shortly after announcing the consultation.

During the consultation

A3.2 We will be clear about whom we are consulting, why, on what questions and for how long.

A3.3 We will make the consultation document as short and simple as possible, with an overview of no more than two pages. We will try to make it as easy as possible for people to give us a written response.

A3.4 We will consult for up to ten weeks, depending on the potential impact of our proposals.

A3.5 A person within Ofcom will be in charge of making sure we follow our own guidelines and aim to reach the largest possible number of people and organisations who may be interested in the outcome of our decisions. Ofcom's Consultation Champion is the main person to contact if you have views on the way we run our consultations.

A3.6 If we are not able to follow any of these seven principles, we will explain why.

After the consultation

A3.7 We think it is important that everyone who is interested in an issue can see other people's views, so we usually publish the responses on our website at regular intervals during and after the consultation period. After the consultation we will make our decisions and publish a statement explaining what we are going to do, and why, showing how respondents' views helped to shape these decisions.

A4. Consultation coversheet

Basic details

Consultation title:

To (Ofcom contact):

Name of respondent:

Representing (self or organisation/s):

Address (if not received by email):

Confidentiality

Please tick below what part of your response you consider is confidential, giving your reasons why

- Nothing
- Name/contact details/job title
- Whole response
- Organisation
- Part of the response

If you selected 'Part of the response', please specify which parts:

If you want part of your response, your name or your organisation not to be published, can Ofcom still publish a reference to the contents of your response (including, for any confidential parts, a general summary that does not disclose the specific information or enable you to be identified)?

Yes No

Declaration

I confirm that the correspondence supplied with this cover sheet is a formal consultation response that Ofcom can publish. However, in supplying this response, I understand that Ofcom may need to publish all responses, including those which are marked as confidential, in order to meet legal obligations. If I have sent my response by email, Ofcom can disregard any standard e-mail text about not disclosing email contents and attachments.

Ofcom aims to publish responses at regular intervals during and after the consultation period. If your response is non-confidential (in whole or in part), and you would prefer us to publish your response only once the consultation has ended, please tick here.

Name

Signed (if hard copy)

A5. Consultation questions

Question 1: Do you anticipate this licence variation will pose coexistence challenges to existing NGSO services?

Question 2: Are the measures set out by the applicant to enable coexistence with future NGSO systems reasonable?

Question 3: Do you expect that granting this variation request would adversely affect competition? If so, please explain why.

Question 4: Do you have any additional concerns or comments regarding the variation request?

Question 5: Do you agree with our assessment of the potential impact on specific groups of persons?

Question 6: Do you agree with our assessment of the potential impact of our proposal on the Welsh language?