

# Global Titles and Mobile Network Security

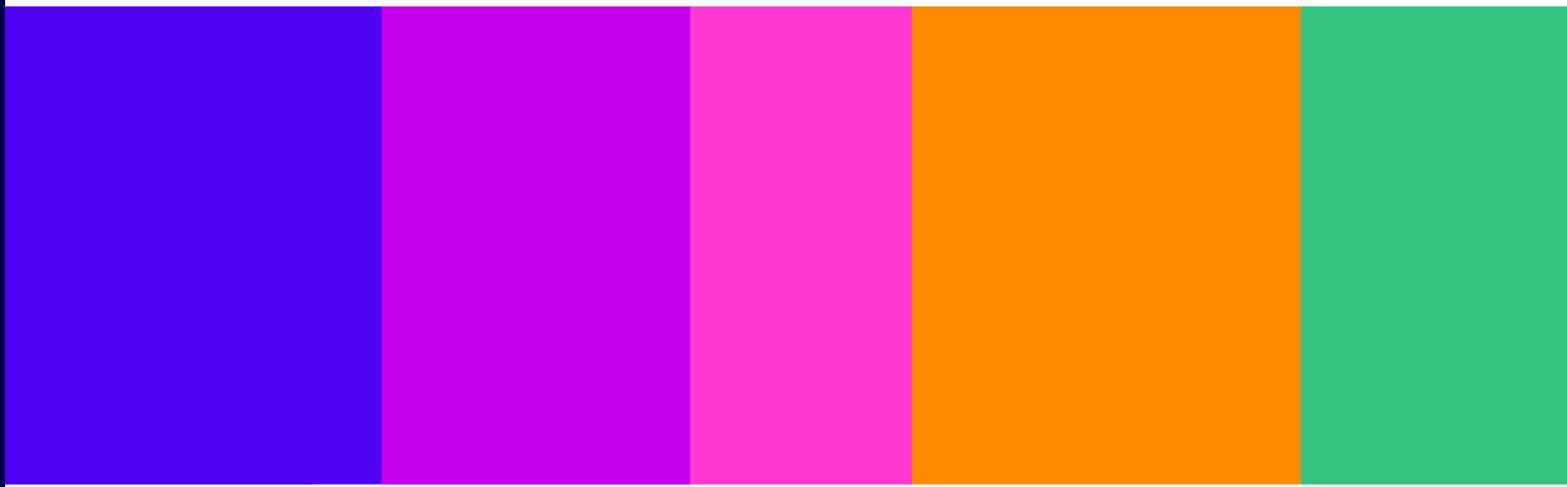
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Proposals to address misuse of Global Titles  
(Non-Confidential Version)

## Consultation

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# 1. Overview

- 1.1 Mobile operators use Global Titles as a routing address for the exchange of signalling messages with other mobile networks and to support their provision of mobile services.
- 1.2 Global Title numbers are created from the ranges of mobile numbers that we allocate to mobile operators. A small number of operators have been leasing their Global Title numbers to third parties. While third parties may use the Global Titles to facilitate their provision of legitimate mobile services, this practice has also allowed bad actors to access the global mobile signalling network.
- 1.3 Malicious signalling can cause significant harms including illicitly locating and tracking people using their mobile phones on other networks, intercepting and diverting messages and data, and disrupting the operation of networks. It also gives rise to reputational risk to the UK as these harms have regularly been facilitated by the misuse of UK mobile numbers.
- 1.4 Ofcom's role as the administrator of UK telephone numbers requires us to ensure the best and efficient use of those numbers. The misuse of Global Titles does not align with this duty and the obligations imposed on number range holders. Promoting network security and resilience is also part of our broader strategy as referenced in our 2024/25 Annual Plan.
- 1.5 We found that +44 Global Titles are one of the most significant and persistent sources of malicious signalling traffic affecting mobile networks globally. The National Cyber Security Centre is also aware that +44 Global Titles have been exploited for malicious purposes, such as location tracking and the interception of SMS used for 2-step verification (2SV) to target both UK residents and populations globally.
- 1.6 We consider that current measures, such as the GSMA Global Title Leasing Code of Conduct and controls implemented by some Global Title lessors, have not been effective at preventing malicious signalling. As a result, we believe that intervention from Ofcom is necessary and proportionate and have set out our proposals below.

## What we are proposing – in brief

We are proposing to strengthen our existing rules and introduce new rules to tackle misuse of Global Titles, in particular by:

- banning leasing of Global Titles to third parties by operators that hold UK mobile numbers;
- banning the creation of Global Titles from sub-allocated numbers by third parties;
- strengthening our rules to prohibit the misuse of Global Titles by operators that hold UK mobile numbers; and
- strengthening our rules to prohibit the creation of Global Titles from numbers not allocated for use.

Taken together, these proposals should significantly reduce malicious signalling from UK Global Titles, thereby providing material benefits to UK and international citizens. They should also enhance the transparency and accountability of operators that use Global Titles.

We consider that these proposals are appropriate and proportionate. They will result in a significant reduction in harm to UK and international citizens which we consider outweighs the adverse impacts on lessors and lessees that we have identified. Our assessment suggests that any adverse impacts are likely to be limited, in particular due to the availability of alternative ways of providing legitimate mobile services that are currently facilitated by the leasing of Global Titles.

We propose that the rules to prohibit misuse of Global Titles by operators that hold UK mobile numbers and the rules to prohibit the creation of Global Titles from numbers not allocated for use should come into force immediately after the publication of our final decision. We propose that the ban on leasing, alongside the ban on creating Global Titles from sub-allocated numbers, should come into force from **1 January 2026**. This should provide the relevant parties with sufficient time to migrate to alternative solutions and dissolve legacy arrangements.

- 1.7 We invite comments on the proposals set out in this consultation which closes on **15 October 2024**. In particular, we invite responses to the specific questions asked which are summarised in Annex 4.

## 2. Introduction and background

- 2.1 This consultation addresses the risks that arise from bad actors gaining access to the signalling systems used between mobile networks around the world. It sets out proposals to use our powers as the UK's numbering authority to prevent the misuse of Global Title (GT) numbers that are used for network signalling.
- 2.2 In this introductory section we provide background to mobile network signalling and explain the role of GTs in routing signalling messages. We then outline the security risks associated with misuse of GTs and explain that the leasing of GTs has been identified as a prominent source of malicious signalling.
- 2.3 We also set out our objectives in relation to GTs and mobile network security and summarise the relevant legal framework for this consultation, which includes the powers and duties relating to our role as the administrator of UK telephone numbers and relevant elements of the framework for network and service security set out in the Communications Act 2003 (as amended by the Telecommunications (Security) Act 2021).

### Global Titles and mobile network signalling

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- 2.4 Signalling is the exchange of control information within and between telecoms networks. 2G and 3G mobile networks use the Signalling System No. 7 (SS7) protocol suite to facilitate the provision of mobile services. SS7 signalling messages are used for a range of functions including authenticating handsets to the network, setting up and terminating calls, sending SMS messages, subscriber profile management and to facilitate roaming.
- 2.5 GTs are mobile numbers that mobile operators use as network addresses. These are used to route SS7 signalling messages between networks. Mobile numbers used as GTs are used solely for this purpose and are not assigned to end users.
- 2.6 This consultation is about security risks arising from SS7 signalling associated with GTs formed from +44 mobile numbers. These +44 numbers have been allocated to both UK operators and to operators in the Crown Dependencies.<sup>1</sup> References in this consultation to +44 GTs are references to GTs used by both Crown Dependency and UK operators and references to UK GTs are references to GTs used by UK operators only.
- 2.7 In this consultation, references to mobile signalling and signalling are references to SS7 signalling unless stated otherwise. Such references do not therefore encompass other signalling protocols such as the Diameter protocol used in 4G networks.
- 2.8 Below, we provide:
- an overview of the security risks associated with SS7 signalling;
  - an explanation of GT leasing and how it has increased these security risks; and
  - a summary of an initiative by the mobile industry to address these risks.

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<sup>1</sup> The Bailiwicks of Jersey and Guernsey and the Isle of Man are constitutional dependencies of the British Crown (the Crown Dependencies). The Crown Dependencies have their own telecommunications legislation and communications regulators.

## Overview of SS7 signalling and security risks

- 2.9 SS7 is a legacy signalling protocol that was not originally designed with security in mind, as it was intended to be used by network operators who were assumed to be trustworthy. It has inherent vulnerabilities that can be exploited by those with access to GTs and the international signalling networks.
- 2.10 A bad actor with such access may be able to use SS7 signalling to undertake a range of harmful activities including:
- illicitly locating and tracking end users;
  - intercepting and diverting calls, messages and data;
  - accessing information held by mobile operators, contrary to privacy and data protection requirements; and
  - disrupting the operation of networks.
- 2.11 Given the global nature of the SS7 signalling networks, these activities can affect end users and networks in the UK and around the world wherever 2G and 3G networks remain in use (see box below).
- 2.12 Users of 4G and 5G networks can also be affected by malicious SS7 signalling because in many countries, including the UK, 2G and 3G networks operate alongside 4G and 5G networks, providing fallback coverage in areas where 4G or 5G coverage is not yet available. To facilitate seamless hand-off when users move in and out of 4G/5G coverage areas, end users are registered on 2G/3G networks as well as 4G/5G networks. SS7 signalling can therefore be used to determine a user's location even when they are not actively using a 2G or a 3G service.
- 2.13 The vulnerabilities of the signalling system are well understood, and mobile operators deploy security measures to address them. These measures include signalling firewalls which block unauthorised message types and monitoring tools which look for suspicious activities.<sup>2</sup> As we discuss in more detail below, UK mobile operators are subject to security duties which require them to implement measures to secure their networks and signalling resources they make available to others.
- 2.14 However, security measures cannot completely secure mobile networks against these vulnerabilities. This is partly because some harmful activities use message types that are also used for legitimate services and cannot therefore be blocked by firewalls. Also, bad actors are constantly searching for new techniques to bypass security measures, such as sending signalling messages from multiple GTs on different networks to mask their attacks.

### Withdrawal of 2G and 3G mobile networks

2G and 3G networks are being gradually superseded by 4G and 5G mobile networks and will ultimately be withdrawn. However, this process is likely to take some time across the world, during which time the vulnerabilities of SS7 will continue to present a risk to the users of these networks.

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<sup>2</sup> For example, the GSMA has published guidance - [FS.11 – SS7 Interconnect Security Monitoring and Firewall Guidelines](#). This includes a detailed description of abnormal traffic types that operators should monitor for and provides recommendations about firewall configuration and other countermeasures.

UK mobile operators have confirmed to the Government that they will not offer 2G and 3G services beyond 2033 at the latest.<sup>3</sup> 3G networks are being withdrawn first. Vodafone and EE have withdrawn their 3G networks. Three is currently withdrawing its 3G network and VirginMediaO2 will start withdrawal in 2025. Withdrawal dates for 2G services have not yet been announced.

The pace of change varies significantly in other countries. Many providers have already withdrawn 2G and/or 3G services or have announced withdrawal dates. Some countries will complete their transition to 4G/5G before the UK, however, many providers have yet to announce plans to withdraw 2G and 3G services.

UK mobile operators will need to maintain their SS7 signalling access, including GTs, even after UK 2G and 3G networks are fully withdrawn, to facilitate roaming in countries where 2G or 3G networks remain in use. So even beyond 2033, users of foreign 2G and 3G networks, including UK users roaming on those networks, could continue to be at risk from malicious signalling from UK GTs.

## Global Title leasing

2.15 GT leasing is the practice whereby a mobile operator enters into a commercial arrangement to allow another operator to use one or more of its GTs. In this consultation, we refer to these parties as lessors and lessees.<sup>4</sup>

2.16 Lessees obtain access to the global SS7 signalling network either via their lessor or a transit carrier<sup>5</sup> and use their leased GTs as network addresses for their signalling node(s). A leased GT therefore enables the lessee to use the global SS7 signalling network to send signalling messages to mobile networks around the world. Historically, leased GTs have been used by lessees to facilitate their provision of a variety of services to end-users. These services include:

- Mobile virtual network operator (MVNO) services – an MVNO provides mobile phone services using the radio access network of a host mobile operator. MVNOs that have their own core network equipment (often referred to as thick MVNOs or full MVNOs) use GTs to send SS7 signalling messages between their core network equipment and the host network.
- Outbound roaming – this is an alternative to conventional bilateral roaming agreements between mobile networks, under which a host operator (sponsor) provides a client operator (typically an MVNO) with an additional mobile number. This additional number is loaded into the end-user’s SIM alongside their own number and is used to facilitate roaming calls (e.g. for frequent travellers).
- Network extension – an arrangement whereby a mobile operator extends its coverage (either nationally or internationally) by means of an agreement to allow its customers to use another operator’s network.
- Communications platform as a service (CPaaS) – a cloud-based service with communications functionality that enables developers to integrate telephony/SMS

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<sup>3</sup> Ofcom Feb 2023. [3G and 2G Switch-off, our expectations of mobile providers.](#)

<sup>4</sup> In some cases, lessees may enter into a commercial arrangement to sub-lease a GT.

<sup>5</sup> A transit carrier provides commercial conveyance of telecoms traffic between networks.

functionality into software applications. Services with 2G/3G capabilities may use GTs to facilitate SS7 signalling with mobile networks.

- Application to Person SMS messaging (A2P SMS) – a SMS service for businesses and public bodies that uses software applications to send large volumes of SMS messages to consumers / citizens, e.g. for appointment confirmation, delivery notifications, two factor authentication.
- Authentication services – typically a reference to services which use SS7 signalling to retrieve information held by other mobile operators regarding their subscribers, sometimes for security/authentication purposes, such as whether there has been a recent SIM-swap<sup>6</sup> or to identify the current location of the user.
- Penetration testing – GTs may be used by network security specialists who are commissioned by mobile operators to test the security of their SS7 signalling interfaces.
- Least cost routing/number authentication – services which use SS7 signalling to retrieve information held by mobile operators about whether a mobile number is valid and the network on which it currently resides. These services may be used for various purposes, e.g. by operators and businesses to optimise the routing of calls or SMS messages.

2.17 Mobile operators may also make their GTs available to companies within their corporate group as well as to third-party suppliers who are contracted to provide services to the mobile operator and its customers. We have taken this into account in developing our policy proposals in this consultation.

## Security concerns about Global Title leasing

2.18 The consensus among cyber security professionals is that GT leasing is a major security threat to mobile networks because it has greatly increased the number of providers with access to GTs. This has enabled bad actors to gain access to the global SS7 signalling network and has led to a greatly increased incidence of harmful signalling activities. The concerns are particularly acute where signalling traffic is not routed via the lessor's network (a practice known as lessee-only routing) because the lessor is unable to monitor the lessee's signalling traffic directly for malicious activity.

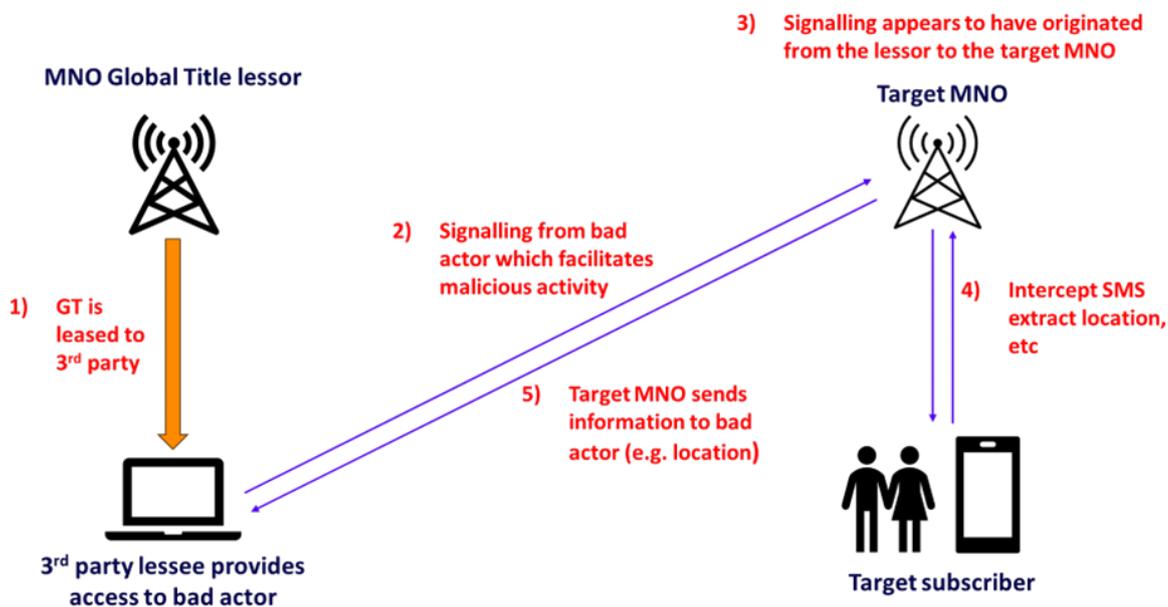
2.19 GT leasing also reduces the transparency of mobile network signalling, since the signalling traffic appears to a receiving network to have originated from the lessor (typically an established mobile operator), masking its true source.<sup>7</sup> This has made GTs formed from +44 mobile numbers attractive to bad actors who exploit their status as presumptively safe sources of signalling traffic.

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<sup>6</sup> Sim swap refers to the transfer of a mobile phone number to a different SIM. It could indicate that someone has fraudulently gained control of the mobile number.

<sup>7</sup> Sub-leasing of GTs further reduces transparency.

Figure 2.1: Simplified schematic of Global Title leasing signalling patterns



Source: Ofcom

2.20 GTs formed from +44 mobile numbers have become one of the most significant sources of harmful signalling targeting mobile networks (and their users) around the world, including the UK. The bulk of this malicious signalling is believed to emanate from GTs leased by mobile operators in the UK and Crown Dependencies. This is likely to cause significant harms to users of mobile networks around the world, including the UK. It also harms the reputation of the UK.

2.21 In this consultation, we consider whether we should take steps to address harmful signalling originating from UK GTs.

## The GSMA Global Title Leasing Code of Conduct

2.22 The GSMA has published a Global Title Leasing Code of Conduct (the GSMA Code) in response to concerns about unauthorised use of leased GTs.<sup>8</sup> This states that unauthorised use typically exploits the vulnerabilities of SS7 (as documented in its SS7 Interconnect Security Monitoring and Firewall Guidelines<sup>9</sup>) and that in extreme cases it may be used for malicious signalling.

2.23 The GSMA Code lists a range of concerns about GT leasing, including:

- GT leasing hides the true source and identity of the source of signalling.
- The target operator (i.e. the recipient of the lessee's signalling) requires the assistance of either the lessor or the transit carrier to undertake due-diligence on the originator.
- Lessees may sub-lease their GTs.

<sup>8</sup> GSMA 2023. [FS.52 Global Title Leasing Code of Conduct](#).

<sup>9</sup> GSMA 2023. [FS.11 - SS7 Interconnect Security and Firewall Monitoring Guidelines](#).

- The target operator has not given consent to be interconnected with the lessee or sub-lessee and may not be aware that a GT is being used other than for the use-case agreed with the lessor.
- GT leasing can adversely impact the target operator, in extreme cases GT leasing can facilitate a denial-of-service attack on the target user's device.
- The target operator may be in breach of data protection or privacy legislation through leakage of personal identifiable information.
- The use of GTs for unauthorised or malicious purposes can lead to reputational damage to the lessor and national numbering resources.<sup>10</sup>

2.24 The GSMA Code states that the GSMA considers that alternatives (which do not require leased GTs) are available for most use cases. It strongly recommends that its members do not lease GTs.<sup>11</sup>

2.25 The GSMA has also asked its members that continue to lease GTs to comply with its voluntary code of conduct designed to minimise the risk of harm.<sup>12</sup> This comprises a set of measures for GT lessors and a further set of measures for transit carriers as summarised in the box below.

#### The GSMA Global Title Leasing Code of Conduct

The main provisions of the GSMA Code for GT lessors are:

- Responsibility – lessors are responsible for the signalling traffic generated by lessees including any liabilities.
- Due diligence – lessors must conduct due diligence prior to granting lessees access to their GTs, including a review of the company and its declared use-case for the leased GT. Lessors must also conduct retrospective and periodic due diligence on existing lessees.
- Transparency – lessors who are full members of the GSMA must declare their leased GTs including lessees' names in their GSMA Roaming Database IR.21 submissions.
- Lessor routing – lessors must require lessees to route all signalling traffic via the lessor's network so that it can be monitored.
- Real time technical controls – lessors must implement technical controls to limit lessees' signalling traffic to message types required for the declared use case.
- Sub leasing – sub leasing of leased GTs is discouraged. Lessors must require lessees to declare any instances of sub-leasing and must apply the Code of Conduct to sub-lessees.
- Transit carrier – lessors must require lessees to use a transit carrier that has signed up to the GSMA Code.

<sup>10</sup> GSMA, FS.52 Global Title Leasing Code of Conduct, section 2.4.

<sup>11</sup> GSMA, [FS.52 Global Title Leasing Code of Conduct, page 8](#).

<sup>12</sup> The GSMA states that penetration testing may require leased GTs. It also excludes outbound roaming and network extensions from the scope of its Code of Conduct even though leased GTs are sometimes used for this purpose.

- Signalling tracing – lessors must consent to their transit carrier providing signalling traces when requested so that target operators can determine the source of the suspicious signalling traffic.
- Disclosure – lessors must also disclose details of their lessees where evidence of unauthorised or malicious traffic is provided.
- Threat intelligence – lessors should support and participate in threat intelligence sharing and should not object to being named in such reports.
- Signalling data retention – lessors must retain summary signalling data for a minimum of four months and signalling trace data for at least 10 days.
- Termination – lessors must terminate GT leases when they identify that lessees or sub-lessees have provided false information about their use-cases or about sub-leasing.<sup>13</sup>

The main provisions of the GSMA Code for SS7 transit carriers are requirements to prevent lessees routing signalling traffic to other networks directly (rather than via the lessors' network), block leased GT traffic on request and to support signalling investigations and threat intelligence activities.<sup>14</sup>

## Legal framework

2.26 In the paragraphs below, we have set out a summary of our powers and duties that are relevant to the proposals in this consultation, including in relation to numbering. We have also briefly explained our powers and duties relating to telecoms security more broadly. Full details of the relevant legal framework is set out in Annex 5 to this consultation.

### Our general duties

- 2.27 When making the proposals in this statement we have had regard to our general duties including our principal duty under section 3(1) of the Communications Act 2003 (the Act) to further the interests of citizens in relation to communication matters; and consumers in relevant markets, where appropriate by promoting competition.
- 2.28 In performing our duties, we are required to have regard to the principles under which our regulatory activities should be transparent, accountable, proportionate, consistent, and targeted only at cases in which action is needed, as well as any other principles appearing to us to represent best regulatory practice.<sup>15</sup>
- 2.29 We must also have regard, when performing our duties, to a number of matters as they appear to us to be relevant in the circumstances, including:
- the desirability of promoting competition in relevant markets;
  - the desirability of encouraging investment and innovation in relevant markets;

<sup>13</sup> GSMA March 2023, FS.52 Global Title Leasing Code of Conduct, section 5.1, code of conduct requirements for lessors.

<sup>14</sup> GSMA, March 2023. FS.52 Global Title Leasing Code of Conduct, section 5.1, code of conduct requirements for transit carriers.

<sup>15</sup> Section 3(3) Communications Act 2003.

- the needs of persons with disabilities, of the elderly and of those on low incomes;
- the desirability of preventing crime and disorder;
- the opinions of consumers in relevant markets and of members of the public generally;
- the different interests of persons in the different parts of the United Kingdom, of the different ethnic communities within the United Kingdom and of persons living in rural and urban areas.<sup>16</sup>

2.30 In addition, section 3(5) of the Act requires that, when performing our duty to further the interests of consumers, we must have regard, in particular, to the interests of those consumers in respect of choice, price, quality of service and value for money.

2.31 We must also have regard to:

- The UK Government’s Statement of Strategic Priorities (SSP) for telecommunications, management of radio spectrum and postal services in accordance with section 2B of the Act.<sup>17</sup> In particular, we must have regard to the security and resilience of the UK’s telecoms networks which is a priority area covered by the SSP.
- The desirability of promoting economic growth in accordance with section 108 of the Deregulation Act 2015.

2.32 Ofcom is required under section 56 of the Act to publish a National Telephone Numbering Plan (the Numbering Plan)<sup>18</sup> which sets out information on the telephone numbers available for allocation, any restrictions on how they may be adopted, any requirements for the purpose of protecting consumers and other restrictions on the other uses to which numbers may be put. The types of restrictions that can be included in the Numbering Plan include:

- a) such restrictions as Ofcom consider appropriate on the adoption of numbers available for allocation in accordance with the plan; and
- b) such restrictions as they consider appropriate on the other uses to which numbers available for allocation in accordance with the plan may be put.

2.33 Ofcom is required to keep the Numbering Plan under review and make any revisions as it thinks fit in consequence of such a review but before doing this, Ofcom must:

- be satisfied that the revision or modification is:
  - > objectively justifiable in relation to the matters to which it relates;
  - > not such as to discriminate unduly against particular persons or against a particular description of persons;
  - > proportionate to what the modification is intended to achieve; and
  - > in relation to what it is intended to achieve, transparent.
- and publish a consultation.

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<sup>16</sup> Section 3(4) Communications Act 2003. A range of further duties are set out in section 4 of the Communications Act 2003.

<sup>17</sup> DCMS, 2019. [Statement of Strategic Priorities for telecommunications, the management of radio spectrum, and postal services.](#)

<sup>18</sup> Ofcom, 2022. [The National Telephone Numbering Plan.](#)

2.34 Section 4 of the Act requires us, when carrying out our functions, including our numbering functions, to act in accordance with the six requirements set out in that section which include to promote the interests of all members of the public in the United Kingdom.

## Numbering Conditions

2.35 Ofcom has powers under section 45 of the Act to impose conditions on communications providers, including numbering conditions relating to the allocation, adoption and use of telephone numbers.

2.36 Section 58 of the Act identifies the type of general conditions Ofcom can impose in relation to the allocation and adoption of numbers which include in particular:

- a) restrictions on the adoption of telephone numbers by a communications provider, and on other practices by communications providers in relation to telephone numbers allocated to them; and
- b) requirements on a communications provider in connection with the adoption by them of telephone numbers.

2.37 The conditions on the allocation, adoption and use of telephone numbers are mainly set out in the General Conditions of Entitlement (General Conditions), specifically General Condition B1<sup>19</sup>, and these include an obligation on providers to secure that telephone numbers are adopted or otherwise used effectively and efficiently<sup>20</sup>, which means that numbers should not be misused.

2.38 GTs are formed from mobile numbers and are therefore subject to these General Conditions.

2.39 Section 59 of the Act also explains that Ofcom can impose conditions on persons other than communications providers, via the Numbering Condition Binding Non-Providers, that relate to:

- a) the allocation of telephone numbers to such persons;
- b) the transfer of allocations to and from such persons; and
- c) the use of telephone numbers by such persons.

2.40 The conditions that may be set include conditions corresponding to the General Conditions relating to the allocation, transfer and use of telephone numbers (e.g. some of the conditions under General Condition B1).<sup>21</sup>

## Good practice guide to help prevent misuse of sub-allocated and assigned numbers

2.41 In 2022, Ofcom published the Good practice guide to help prevent the misuse of sub-allocated<sup>22</sup> and assigned<sup>23</sup> numbers (the Good Practice Guide).<sup>24</sup> The guide sets out the steps we expect providers to take when sub-allocating or assigning numbers to ensure their compliance with General Condition B1.6, B1.8 and B1.9<sup>25</sup> and help prevent valid telephone

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<sup>19</sup> [General Conditions of Entitlement – Ofcom.](#)

<sup>20</sup> General Condition B1.6.

<sup>21</sup> Section 59(2) of the Act.

<sup>22</sup> Sub-allocation means the allocation of numbers by a provider to other providers or resellers.

<sup>23</sup> Assigned means the transfer of numbers to end users, i.e. individuals and businesses.

<sup>24</sup> [Good practice guide to help prevent misuse of sub-allocated and assigned numbers.](#)

<sup>25</sup> See paragraph 2.19 to 2.20 of the Good Practice Guide for details on who is in scope of this guide.

numbers being misused, including to facilitate scams. These steps relate to due diligence checks before sub-allocating or assigning numbers, ensuring continued compliance and reassessing risk after transfer of numbers and responding to incidents of misuse. The Good Practice Guide applies when those numbers are sub-allocated or assigned to end-users for use for the purposes of, or in connection with, a business and, where relevant, section 5 of the Good Practice Guide (relating to responding to incidents of misuse) also applies where the end user is a consumer.

- 2.42 While the Good Practice Guide does not reference GT leasing, we consider it to be applicable to GT leasing as it is a form of number sub-allocation.

### Enforcement powers

- 2.43 We have powers under the Act to take enforcement action against persons that contravene the numbering conditions, including the power to issue penalties, withdraw telephone numbers allocated and suspend one's entitlement to provide an electronic communications network or service, or to make associated facilities available.<sup>26</sup>
- 2.44 Ofcom also has powers under the Act to take enforcement action against persons who persistently misuse electronic communications networks and services.<sup>27</sup>
- 2.45 We discuss our enforcement powers in the event of non-compliance with our numbering conditions in more detail in Section 5.

### Application to Global Titles

- 2.46 GTs are formed from mobile numbers and are therefore subject to the conditions applicable to the allocation, adoption and use of telephone numbers as discussed above. It therefore follows that:
- GTs may only be used for the provision of mobile services as specified in the designation for mobile numbers in Part B of the Numbering Plan.<sup>28</sup>
  - Communications providers must ensure compliance with General Condition B1 in relation to their use of GTs. For example, this means they must ensure the effective and efficient use of numbers used as GTs (B1.6) which includes ensuring numbers are not misused.<sup>29</sup> They must also take all reasonably practicable steps to secure their customers comply with the General Conditions (including B1.6) in relation to their use of GTs (B1.8).
  - As the practice of GT leasing involves the sub-allocation of a mobile number, we consider that it is subject to the Good Practice Guide on steps that providers are expected to take to address the risk of misuse.
  - Ofcom may consider taking enforcement action, including withdrawing an allocation of mobile numbers, in the case of misuse relating to GTs.

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<sup>26</sup> Section 61 and 96A to 104 of the Act.

<sup>27</sup> Sections 128 – 130 of the Act.

<sup>28</sup> Mobile Service means a service consisting in the conveyance of signals, by means of an electronic communications network, where every signal that is conveyed thereby has been, or is to be, conveyed through the agency of wireless telegraphy to or from apparatus designed or adapted to be capable of being used while in motion.

<sup>29</sup> See, for example, paragraph 2.15 of the Good Practice Guide.

## The Telecommunications (Security) Act 2021 framework

2.47 Under the Act<sup>30</sup>, as amended by the Telecommunications (Security) Act 2021,<sup>31</sup> public telecoms providers are required to have measures in place to identify and reduce the risks of security compromises, as well as preparing for any future risks. They must also take action after a security compromise has occurred, to limit damage and take steps to remedy or mitigate any damage. The Act also provides for the Secretary of State to make regulations providing for public network and service providers to take specified measures or measures of a specified description, including where a security compromise of a specified description occurs. The Electronic Communications (Security Measures) Regulations 2022 (the Regulations) made under these provisions also set out measures that providers must take and in brief these include:

- making sure that network equipment that handles sensitive data is securely designed, built and maintained;
- reducing supply chain risks;
- carefully controlling access to sensitive parts of the network; and
- making sure the right processes are in place to understand the risks facing their public networks and services.

2.48 Ofcom has a general duty to seek to ensure that public network and service providers comply with their security duties. As part of this duty, it is working with such providers to improve their security and monitor their ongoing compliance.

## The Telecommunications Security Code of Practice

2.49 Pursuant to section 105E of the Act, the Secretary of State may issue codes of practice giving guidance as to the measures to be taken under sections 105A to 105D by public network and service providers. The Secretary of State has published the Telecommunications Security Code of Practice (the Telecoms Security Code)<sup>32</sup> to provide guidance for large and medium-sized public telecoms providers whose security is most crucial to the effective functioning of the UK's telecoms critical national infrastructure.<sup>33</sup>

2.50 The Telecoms Security Code includes technical guidance on the signalling plane of public telecoms networks (i.e. the signalling functions of networks), comprising:

- guidance on the key concepts of signalling plane security; and

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<sup>30</sup> Sections 105A to 105Z of the Act.

<sup>31</sup> <https://www.legislation.gov.uk/ukpga/2021/31/contents/enacted>.

<sup>32</sup> DCMS, December 2022, [Telecommunications Security Code of Practice](#).

<sup>33</sup> Large providers are defined as those with relevant turnover of £1bn or more and medium providers are defined as those with relevant turnover of £50m or more but less than £1bn. Relevant turnover is defined as turnover made from any 'relevant activity' carried out wholly or partly in the UK after the deduction of sales rebates, value added tax and other taxes directly related to turnover. Relevant activity means any of the following: the provision of electronic communications services to third parties; the provision of electronic communications networks, electronic communications services and network access to communications providers; or the making available of associated facilities to communications providers. This is the same as the definition used in the setting of Ofcom's administrative fees.

- technical guidance measures which are specific technical measures to be taken by operators to secure their networks.<sup>34</sup>

2.51 As set out in more detail below, the guidance is principally concerned with measures to secure the signalling plane of operators' own networks, (i.e. measures that operators should take to secure their networks against malicious signalling arriving from other networks). However, there is also guidance about signalling resources that operators allow others to use, such as leased GTs.

### Key concepts of signalling plane security

2.52 The key concepts for signalling plane security set out in the Telecoms Security Code include the following of particular relevance to SS7 signalling:

- Traditionally, signalling networks have been built on the assumption that signalling from other telecoms networks can be trusted. However, that assumption is no longer valid as international interfaces could be exploited by attackers.
- Operators need to operate on the principle that incoming signalling is untrusted and build signalling security that can validate incoming signalling without impacting core networks' functions.
- Operators should seek to increase their network's resilience to disruptive attacks from incoming signalling networks and to inhibit the leaking of subscriber or network data over such networks.<sup>35</sup>

### Technical guidance measures

2.53 The technical guidance measures set out in the Telecoms Security Code include measures that operators are expected to take to secure the signalling plane of their networks against external signalling attacks. These measures are divided into four groups for phased implementation between March 2024 and March 2028.

2.54 There is also a technical guidance measure for large and medium operators concerning number ranges allocated to operators (including GTs formed from such allocations) that they allow others to use for signalling purposes:

- Where operators allow others to use number ranges that have been allocated to them (e.g. GTs, mobile numbers)<sup>36</sup>, they remain responsible for the activity related to that number range, and any further security implications.<sup>37</sup>

2.55 The guidance therefore specifies that operators are responsible for the signalling activity and any security implications for GTs that they lease.

2.56 The Telecoms Security Code does not, however, include any technical guidance about measures that operators should take to address the security implications, for example to monitor their GT lessees' activities or to prevent their lessees from engaging in malicious signalling activities.

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<sup>34</sup> The technical guidance measures are not the only way for operators to comply with the security duties and the Regulations. Operators may choose to adopt different technical solutions or approaches. However, Ofcom may require the operator to explain the reasons why they are not acting in accordance with the provisions of the Code in order to assess whether they are meeting their legal obligations under the security framework.

<sup>35</sup> TSA Code of Practice, paragraphs 2.70 to 2.82.

<sup>36</sup> Excluding numbers shared through mobile number portability.

<sup>37</sup> DCMS, December 2022. Telecommunications Security Code of Practice, technical guidance measure M3.08.

## Our objectives

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- 2.57 Taking into account our general and numbering duties identified above, our objectives in determining our approach to GTs and our proposals for new regulations are as follows:
- significantly and effectively reduce the misuse of UK GTs and the associated harms to UK and international citizens;
  - improve the transparency and accountability of operators that use UK GTs; and
  - support the effective function of the UK telecommunications sector including by promoting network security and ensuring best and efficient use of telephone numbers.
- 2.58 These objectives align with our broader strategy to promote network security and resilience.<sup>38</sup>

## Impact assessment

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- 2.59 Section 7 of 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. The relevant duties in relation to the proposal on which we are consulting are summarised above.
- 2.60 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.
- 2.61 In Section 3, we present evidence of harms that arise from the misuse of GTs.
- 2.62 In Section 4, we set out our options to address harm and assess their impact and proportionality.

## Equality impact assessment

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- 2.63 Section 149 of the Equality Act 2010 (the 'Equality Act') imposes a duty on Ofcom, when carrying out its functions, to have due regard to the need to eliminate discrimination, harassment, victimisation and other prohibited conduct related to the following protected characteristics: age; disability; gender reassignment; marriage and civil partnership; pregnancy and maternity; race; religion or belief; sex and sexual orientation.
- 2.64 The Equality Act also requires Ofcom to have due regard to the need to advance equality of opportunity and foster good relations between persons who share specified protected characteristics and persons who do not.

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<sup>38</sup> Our 2024/25 Plan of Work sets out 'internet we can rely on' as one of our priority outcomes and identifies 'reliable and secure networks people can depend on' as an area we will seek to deliver for consumers to achieve this priority outcome.

- 2.65 Section 75 of the Northern Ireland Act 1998 (the ‘NI Act’) also imposes a duty on Ofcom, when carrying out its functions relating to Northern Ireland, to have due regard to the need to promote equality of opportunity and have regard to the desirability of promoting good relations across a range of categories outlined in the NI Act. Ofcom’s [Revised Northern Ireland Equality Scheme](#) explains how we comply with our statutory duties under the 1998 Act.
- 2.66 To help us comply with our duties under the Equality Act and the NI Act, we assess the impact of our proposed intervention on persons sharing protected characteristics and in particular whether they may discriminate against such persons or impact on equality of opportunity or good relations.
- 2.67 We have identified the relevant impacts arising from our proposals in footnote 95 of Section 4.

## Structure of this document

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- 2.68 Section 3 sets out our evidence about:
- the misuse of UK GTs and the harms associated with such misuse;
  - our assessment of the suitability of the current regulatory framework and industry best practice to address misuse of leased GTs; and
  - the measures that operators have implemented to prevent misuse of GTs by lessees and our assessment of their effectiveness.
- 2.69 Section 4 sets out our proposals to significantly reduce the harms associated with GT leasing and other misuse and outlines our provisional impact assessment.
- 2.70 Section 5 sets out how we intend to implement our proposals, the legal tests we need to satisfy and the enforcement routes available to us in the event of non-compliance with our proposed rules.
- 2.71 The annexes are set out as follows:
- Annex 1: Responding to this consultation.
  - Annex 2: Ofcom’s consultation principles.
  - Annex 3: Consultation coversheet.
  - Annex 4: Consultation questions.
  - Annex 5: Legal framework.
  - Annex 6: Notification of proposal to set and modify General Conditions under sections 48(1) and 48A(3) of the Act.
  - Annex 7: Notification of proposal to set Numbering Conditions Binding Non-Providers under sections 48(1) and 48A(3) of the Act.
  - Annex 8: Notification of proposal to modify the Numbering Plan under section 60(3) of the Act.
  - Annex 9: Analysis of responses to the Lessor Information request.

## 3. Misuse of Global Titles

- 3.1 This section outlines evidence of the misuse of GTs for malicious signalling and explains the harms associated with such misuse. This includes presenting findings on misuse of +44 GTs sourced from a specialist in signalling security, which suggests that leased GTs are a main source of malicious signalling.
- 3.2 We also outline the findings from our information request regarding the leasing of +44 GTs, including summarising the measures that lessors have implemented to prevent misuse of GTs by their lessees. Finally, we assess whether the current regulatory framework and industry best practice are sufficient to address the misuse of GTs and conclude that further intervention is required to address the harms we have identified.

### Harms from misuse of signalling and Global Titles

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- 3.3 Our principal duty in section 3(1) of the Act is to further the interests of citizens and consumers and our general duty in relation to telephone numbers in section 63(1) of the Act includes securing the best use of appropriate numbers. We consider misuse of GTs to be inconsistent with our duties and addressing misuse of GTs aligns with our broader strategy to promote network security and resilience. We have therefore considered the evidence of misuse of +44 GTs.
- 3.4 As outlined in Section 2, SS7 is a legacy signalling protocol that has inherent vulnerabilities which can be exploited by those with access to GTs and the international signalling networks.
- 3.5 Bad actors with access to the international signalling networks can use GTs to send SS7 signalling messages. They may access GTs by leasing them from number range holders<sup>39</sup> or by obtaining their own numbers and misusing the GTs they create. This can enable them to track the geographic location of mobile users, as well as intercept their SMS and/or redirect voice calls without proper authorisation. We consider these appear likely to be instances of personal data breaches<sup>40</sup> that individuals are entitled to be protected from.
- 3.6 These activities can enable bad actors to:
- spy on individuals;
  - access personal communications; and
  - compromise security measures (such as SMS security codes) to gain access to other services such as social media accounts and bank accounts.
- 3.7 The harms to those affected can include:

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<sup>39</sup> Number range holder / ranger holder refers to a communications provider with an allocation of numbers from Ofcom.

<sup>40</sup> The potential harms we discuss in this section match some of the individual harm categories set out in the ICO's Data Protection Harms Taxonomy, such as loss of control of personal data, bodily harm, unwarranted intrusion and financial harm. <https://ico.org.uk/media/about-the-ico/documents/4020144/overview-of-data-protection-harms-and-the-ico-taxonomy-v1-202204.pdf>.

- inconvenience, embarrassment and reputational harm associated with the disclosure of personal communications;
- loss of personal data and privacy;
- financial losses and emotional harm relating to fraud; and
- in extreme cases, some individuals may be at risk of significant physical harm and/or intimidation.

3.8 We therefore consider that the misuse of GTs poses a significant threat to UK and international citizens. We also note there may be a higher risk of harm for some high-profile individuals (e.g. those holding public office or those with certain religious or political views) as they may be more likely to be the target of signalling attacks. In some cases, severe and irreparable harms could potentially arise from a single instance of misuse of network signalling.

3.9 The misuse of GTs could also lead to harm to the wider telecommunications sector. For example:

- Malicious signalling arising from +44 numbers can reduce trust in UK telephone numbers and potentially harm the reputation of the UK's telecommunications industry.
- Malicious signalling that leads to a breach in network security of UK and international telecoms operators could further require these operators to deploy extra resources and incur costs to handle these incidents.
- In some rare but possible scenarios, malicious signalling could also lead to network outages, thereby impairing the operations of mobile networks and adversely affecting significant numbers of UK and international mobile users.

3.10 In the following sub-section, we outline the evidence of GT misuse that can lead to the harms outlined above before we go on to consider whether regulatory intervention is required and what form that could take.

## Evidence of malicious signalling

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3.11 In this sub-section, we set out the evidence of harm we have identified from:

- a report commissioned by Ofcom on malicious signalling associated with +44 GTs;
- analysis of responses from our information request regarding the leasing of +44 GTs;
- a report from GSMA about the risks of GT leasing;
- a statement from the National Cyber Security Centre (NCSC) regarding the threats of GT misuse; and
- media reports regarding malicious signalling.

## Malicious signalling associated with +44 Global Titles from the Enea Report

- 3.12 To get a better understanding of malicious signalling associated with GTs identified from +44 mobile numbers, we commissioned a report from Enea<sup>41</sup>, a specialist in signalling security<sup>42</sup>, including SS7 (the Enea Report).<sup>43</sup>

### The Enea Report

The Enea Report relates to SS7 signalling activity monitored by Enea across its signalling firewalls in mobile networks between 1 January 2020 and 14 February 2024. During this period, Enea associated thousands of +44 GTs with malicious signalling activity.

Enea found that, in recent years, +44 GTs have been among the most significant and persistent sources of high-risk and malicious mobile signalling traffic observed across all of its SS7 signalling firewalls worldwide. It considered this to be a result of exploitation of commercially leased +44 GTs and signalling infrastructure by a range of companies, generally under the pretence of telecoms service delivery.

The Enea Report includes comparative measures which give insights about the prominence of +44 GTs as sources of malicious signalling compared with those in other countries. These include:

- Threat Source Score – Enea has a proprietary algorithm which rates signalling violations according to threat severity to provide an overall score for each country based on the country code of the GT. Using this algorithm, Enea ranked +44 as the sixth highest scoring country globally over the period. Enea described this score as an extremely high indicator of risk, reflecting factors such as the relative volume and types of malicious signalling observed.
- Signalling violations – Enea uses a broad measure of all suspicious signalling messages which includes signalling messages which are benign<sup>44</sup> and malicious signalling messages. With this measure, Enea rated +44 GTs as the third largest source of signalling violations over the period.
- Key threat types – The Enea Report included a detailed comparative measure which examined the relative incidence of four key types of malicious signalling which it considered, in aggregate, to be a reliable proxy indicator of nation state level targeting activity.<sup>45</sup> Enea found there was a much higher relative incidence

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<sup>41</sup> Formerly known as Adaptive Mobile.

<sup>42</sup> Enea provides signalling firewalls to many mobile operators around the world. It also provides threat intelligence services to its mobile operator customers and other organisations including cyber security agencies. These services draw on signalling data gathered from its firewalls giving it an international view of malicious signalling targeting mobile networks. Sophisticated analysis techniques are used by Enea to detect anomalous signalling patterns that may be malicious and to identify the source GT. Enea can often attribute malicious signalling to a particular actor, for example, the lessee of the GTs used.

<sup>43</sup> Enea, March 2024. Signalling Intelligence Layer – State of the Nation Report for Ofcom (unpublished).

<sup>44</sup> These might include messages generated by misconfigured network elements or a benign valued added service such as fraud detection checks.

<sup>45</sup> The key threat types are unauthorised signalling commands on interconnect links for location tracking, unauthorised signalling commands on interconnect links for location tracking or profile manipulation, coordinated attacks from multiple sources and coordinated attacks from multiple countries.

of these four types of malicious signalling activity from +44 GTs than the overall average in its dataset for this period.

- Snapshot analysis – Enea provided a snapshot of its analysis of signalling source and target information involving +44 GTs spanning a single day (13-14 February 2024). This showed a preponderance of three types of signalling event sequences which are almost certainly malicious signalling. These were coordinated attack sequences originating from multiple different +44 GTs against the same target subscriber or network element, coordinated attack sequences originating from +44 and foreign GTs, and the use of malformed signalling messages to evade an operator’s signalling defences.

The Enea Report included other material illustrating the prominent role of +44 GTs in malicious signalling:

- Case studies of companies which Enea has identified as prominent sources of malicious SS7 signalling globally. These included [X], [X] and [X]. These companies have been associated with GTs from multiple countries with +44 GTs being among the most numerous used by all three companies.<sup>46</sup>
- A case study involving the surveillance of a mobile user in Latin America over an approximately two-year period, during which several +44 GTs were among the most prominent signalling sources among hundreds of GTs used for the surveillance. Enea assessed the origin of the signalling from +44 GTs to be in the control of [X] a UK based operator.<sup>47</sup>

Enea’s view was that the comparative prominence of +44 GTs as a source of malicious signalling could reflect the relative accessibility of +44 GTs, the lack of oversight of leasing arrangements, and the attractiveness of +44 GTs as presumptively trusted senders of signalling traffic.

3.13 The Enea Report included examples of 64 individual +44 GTs and groups of +44 GTs<sup>48</sup> associated with malicious signalling activity over the period.<sup>49 50</sup>

## Analysis of responses to our Lessor Information Request

3.14 In January 2024, we issued an information request (the Lessor Information Request) to seven operators, who confirmed in a previous information request (the January 2023 Information Request)<sup>51</sup> that they have leased one or more of their GTs or otherwise allowed one or more of their GTs to be used by another company. This includes operators that offer

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<sup>46</sup> It is likely that these companies were using leased +44 GTs because none of them have been allocated UK mobile numbers by Ofcom.

<sup>47</sup> It is likely that leased +44 GTs were used because [X] has not been allocated UK mobile numbers by Ofcom.

<sup>48</sup> Multiple GTs from a block of mobile numbers.

<sup>49</sup> One of the examples provided by Enea was a GT formed from an 070 number, a range designated for use for personal numbers rather than mobile numbers.

<sup>50</sup> We describe our analysis of these examples in more detail below. However, we note in particular, that approximately a quarter of these examples related to GTs leased by a UK lessor [X].

<sup>51</sup> In their response to a previous information request in January 2023 which was sent to all operators to whom Ofcom and its predecessors have allocated +44 mobile numbers (including operators in the Crown Dependencies).

services in the UK as well as operators that offer services in the Crown Dependencies (all of which use +44 numbers).

- 3.15 The responses to the Lessor Information Request allowed us to find out which GTs have been leased and to whom, what the stated use cases are that are being delivered through these GTs, how much revenue they are generating from these GTs, and what controls they have in place to mitigate the risk of misuse (amongst others). See Annex 9 for full details of the responses we received.
- 3.16 The responses indicated that lessors have 80 GT leasing arrangements with 71 different lessees (as seven leased GTs from more than one operator).<sup>52</sup> Of these arrangements, 78 were with third parties and two were with suppliers who used the GTs solely to support the provision of services to the lessor. The number of third-party lessees per lessor ranged from 1 - 22. Of the third-party lessees, 74 (i.e. a vast majority of 94%) were customers of the four largest lessors.<sup>53</sup>
- 3.17 The stated use cases provided by the seven lessors included a range of mobile services (such as MVNO services and outbound roaming) and services that utilise information held by mobile operators (such as number authentication). We provided an overview of these service types in Section 2.
- 3.18 We reviewed the information on GTs submitted in responses to our Lessor Information Request and matched those against the +44 GTs that have been identified to be a source of malicious signalling from the Enea Report. We found that:
- Approximately 40% of the +44 GTs (27 GTs/GT groups<sup>54</sup>) were leased from three of the seven operators who we have identified as lessors (and who were sent the Lessor Information Request) ([REDACTED], [REDACTED] and [REDACTED]).
  - Approximately 30% of the +44 GTs (21 GTs/GT groups) were formed from mobile numbers allocated to four other UK operators, ([REDACTED]), who we had not previously identified as lessors because they indicated that they did not lease GTs in their responses to the January 2023 Information Request. This suggests that either the sources of the malicious traffic are the operators themselves and / or they are leasing some of their GTs.
  - Approximately 25% of the +44 GTs (17 GTs/GT group) were formed from unallocated number ranges (mobile numbers that are not currently allocated to operators). These numbers were formerly allocated to four operators ([REDACTED]) but had been withdrawn by Ofcom (e.g. after the operator went out of business). Our numbering rules prohibit the adoption and use of unallocated number ranges, meaning GTs should not have been created from these numbers and be in use.
- 3.19 Overall, our analysis indicates that malicious signalling has arisen from +44 GTs that have been leased out to third parties and it could also arise from GTs that have been owned or used by number range holders themselves. As we discuss in more detail in Section 4, we are

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<sup>52</sup> 74 of the third-party lessees (94%) were customers of the four largest lessors and we note that [REDACTED], a UK lessor, had the second highest number of lessees.

<sup>53</sup> [REDACTED] responses dated 16 February 2024 and 3 May 2024, [REDACTED] responses dated 13 February 2024 and 3 May 2024, [REDACTED] responses dated 16 February 2024 and 3 May 2024, [REDACTED] responses dated 27 February 2024 and 2 May 2024, [REDACTED] responses dated 13 February 2024 and 1 May 2024, [REDACTED] responses dated 13 February 2024 and 3 May 2024 and [REDACTED] response dated 16 February 2024 to the Lessor Information Request.

<sup>54</sup> Multiple GTs from a block of mobile numbers.

considering what steps we could take to stop the use of GTs created from mobile numbers in unallocated number ranges, in addition to addressing the harms arising from the leasing of GTs.

## GSMA Mobile Telecommunications Security Landscape

- 3.20 The GSMA publishes an annual report on security threats to mobile networks that it has tracked both from public sources and within its membership. In its latest report, published in February 2024<sup>55</sup>, the GSMA noted that GT leasing can introduce security risks for mobile operators and their customers because it enables additional entities to gain access to the global SS7 signalling network and reduces routing transparency.
- 3.21 The GSMA cited the Lighthouse Reports and CitizenLab reports (referenced below) and noted that in the year preceding publication in February 2024 there had been several reports of attacks from GTs that have been leased to third parties.

## National Cyber Security Centre statements on Global Title misuse

- 3.22 Concerns about the security of legacy signalling protocols including SS7 have been a key strand of the NCSC's Active Cyber Defence Programme.<sup>56</sup>
- 3.23 In its second annual report in 2019 on the Active Cyber Defence Programme, NCSC noted that:
- [SS7] "was originally created in 1975 and has undergone little fundamental change since then. SS7 has no real security built in and given how the telecoms sector has evolved it can now be trivial to exploit SS7 weaknesses, depending on the network. Exploiting those weaknesses can allow an attacker to geolocate a user's phone, reroute SMS messages and voice calls so that they can be intercepted, get networks to release encryption keys and other nefarious actions. It is impractical to expect a change in the standard for SS7, but we believe we can better protect users of UK networks from these sorts of attacks while simultaneously ensuring that the next generation telecoms signalling protocol (DIAMETER) is better secured."<sup>57</sup>
- 3.24 NCSC has also provided Ofcom with the following statement regarding GT misuse and this consultation:
- "The NCSC is aware that +44 Global Titles have been exploited for malicious purposes, such as location tracking and the interception of SMS used for 2-step verification (2SV) to target both UK residents and populations globally. Our Active Cyber Defence (ACD) Programme has also previously highlighted that a small number of +44 Global Titles seem to be responsible for a disproportionate volume of malicious SS7 traffic.

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<sup>55</sup> GSMA, February 2024. [Mobile Telecommunications Security Landscape](#).

<sup>56</sup> <https://www.ncsc.gov.uk/section/active-cyber-defence/>.

<sup>57</sup> NCSC, July 2019. [Active Cyber Defence \(ACD\) – The Second Year](#).

The NCSC works closely with industry on a voluntary basis to enhance industry practices and safeguard the UK's citizens. We therefore welcome this world-leading consultation on regulatory options in support of our mission in 'Making the UK the safest place to live and work online'."

## Media reports of malicious signalling

- 3.25 The vulnerabilities of SS7 signalling and its use to invoke malicious signalling have also been reported by the media (and we note that these reports are becoming increasingly prevalent).
- 3.26 Several articles have been published that highlight the use of +44 GTs for malicious purposes including:
- A recent Economist article outlined security vulnerabilities of SS7 signalling which can be exploited to monitor a user's location or to monitor voice and text messages. It cited claims that GTs from a mobile operator in the Channel Islands has been used to gain access to SS7 for malicious signalling attacks.<sup>58</sup> It also cited claims that these vulnerabilities allowed Russian hackers to locate and spy on Ukrainian political figures.
  - IrpiMedia, an Italian investigative journalism project, reported on the activities of an Italian company Carro. IrpiMedia reported that GTs leased from a UK operator and operators in other countries were used to obtain the location of mobile users in the Middle East and North Africa.<sup>59</sup>
- 3.27 Several other media reports focus on malicious signalling from GTs that originated from other countries including:
- A report in the Guardian referred to allegations by a whistleblower that SS7 signalling emanating from Saudi Arabia had been used to track Saudi registered mobile phones roaming in the USA.<sup>60</sup>
  - In its report, Ghost in the Network, Lighthouse Reports linked GTs associated with a Swiss national to malicious signalling activity including (i) the use of leased GTs to extract personal data (including location data) from a journalist's phone in Mexico, and the journalist was subsequently murdered the next day; and (ii) the use of GTs in South East Asia and Israel, to take over Telegram and other accounts by redirecting SMS messages used to secure them.<sup>61</sup>
  - A report by CitizenLab described the vulnerabilities of SS7 signalling in detail. It also referred to threat intelligence data concerning surveillance of mobile users in African countries using SS7 signalling. It said these attacks originated from GTs owned by

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<sup>58</sup> The Economist, 17 May 2024. It is dangerously easy to hack the world's phones. See also 404 Media report, 16 May 2024. [Cyber Official Speaks Out, Reveals Mobile Network Attacks in U.S.](#)

<sup>59</sup> IrpiMedia, 8 May 2024. [Chi sono gli operatori telefonici sfruttati dall'azienda italiana di sorveglianza Carro](#) (in Italian - Who are the telephone operators exploited by the Italian surveillance company Carro).

<sup>60</sup> The Guardian, 29 March 2020. [Revealed: Saudis suspected of phone spying campaign in US.](#)

<sup>61</sup> Lighthouse Reports, May 2023. [Ghost in the Network: how a Swiss tech expert runs a global phone surveillance system.](#)

Vietnamese operator, Gmobile, which is owned by the Vietnam Ministry of Public Security.<sup>62</sup>

## Summary of evidence of malicious signalling

- 3.28 As set out above, we have found evidence of significant volumes of malicious signalling attacks originating from +44 GTs that been leased, or used by third parties, or are used by number range holders themselves. These findings are consistent with the general consensus among cyber security professionals that GT misuse is a major risk to mobile networks. In particular, GT leasing has broadened access to GTs and reduced transparency of ownership of GTs, thereby greatly increasing the likelihood of signalling misuse.
- 3.29 Malicious signalling attacks can lead to a range of harms to consumers including personal data breaches and financial losses. In the most extreme cases, some individuals may be at risk of physical harm or intimidation. Furthermore, malicious signalling may have broader implications on the wider telecommunication sector by damaging the reputation of network providers and impairing / disrupting the operation of mobile networks.
- 3.30 It is difficult to quantify the scale of harm associated with malicious signalling from +44 GTs given the clandestine nature of these activities. Indeed, the Enea Report identified potential GT misuse by UK operators that did not inform us they leased their GTs. However, the volume and distribution of malicious signalling from +44 GTs observed by Enea suggests that it is significant. Signalling attacks tend to be globally distributed, meaning there is a risk of harm to both UK and international citizens. Moreover, given the nature of the activities and the actors involved, the harms can be severe and even irreparable in some cases.
- 3.31 We recognise that the scope for malicious signalling from leased UK GTs will gradually reduce as 2G and 3G networks are withdrawn. However, the timing of the final withdrawal of 2G and 3G networks across the world is as yet unknown so we expect that mobile users will continue to be at risk from malicious signalling for some time to come. In the meantime, the risk of misuse of UK GTs may increase if, for example, more UK operators decide to start leasing their GTs.
- 3.32 Overall, we have identified three key sources of malicious signalling and harm due to the misuse of +44 GTs:
- a) **Misuse of GTs by third parties** – Our analysis of the misuse of +44 GTs from the Enea Report and information on GTs provided in responses to our Lessor Information Request indicates that malicious signalling has originated from +44 GTs that have been leased to third parties.<sup>63</sup> This type of misuse is further reported by the GSMA’s Security Report, other media reports and the statement from NCSC. Our analysis also indicates that malicious signalling has originated from operators that are neither number range holders nor known to have leased GTs from number range holders that have told us they are lessors – this implies that it is possible that some malicious signalling could have originated from +44 GTs that have been created from sub-allocated numbers.
  - b) **Misuse of GTs by number range holders** – Our analysis of the misuse of +44 GTs from the Enea Report and information on GTs provided in responses to our Lessor Information Request indicates that malicious signalling has originated from some

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<sup>62</sup> CitizenLab, Munk School of Global Affairs & Public Policy, University of Toronto, October 2023. [The Network Effect of Telecommunications Vulnerabilities for Location Disclosure](#).

<sup>63</sup> Approximately 60% of the GTs and GT groups listed in ENEA’s examples were attributed to UK operators.

number range holders. It is therefore possible that some of this could be due to the misuse of +44 GTs by number range holders themselves, which may be in connection with the provision of a service to a customer (using a GT as an input) that has the potential to generate malicious signalling.

- c) **Creation and misuse of GTs from numbers that have not been allocated for use** – Our analysis of the misuse of +44 GTs from the Enea Report and information on GTs provided in response to our Lessor Information Request indicates that malicious signalling has originated from GTs that were formed from unallocated number ranges (mobile number ranges that are not currently allocated to operators). This could therefore imply that some operators have created and misused GTs from numbers that are not allocated for use.

- 3.33 While not all misuse of +44 GTs has arisen from use of UK GTs (because some +44 numbers are allocated to Crown Dependency operators) we have identified evidence of significant malicious signalling arising from the misuse of UK GTs. The broader evidence of misuse also indicates the potential for further harms to UK and international citizens if the issues we have identified with potential access by bad actors to UK GTs are not addressed.

## Current measures to address harms

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- 3.34 We have identified significant sources of harm and potential harm from the misuse of UK GTs above. We now consider whether further intervention is required by assessing whether existing regulatory obligations, regulatory guidance and industry best-practice guidance (outlined in Section 2) as well as measures taken by the lessors themselves are sufficient to address the harm. These include:
- The Telecoms Security Act framework;
  - Our General Conditions of Entitlement, in particular Condition B1 relating to numbering which applies to communications providers (and our Good Practice Guide);
  - The GSMA Code; and
  - Control measures applied by GT lessors.

## The Telecoms Security Act framework

- 3.35 As set out in Section 2, providers of public networks and services are subject to the revised Telecoms Security Act framework. This framework includes overarching security duties, including a duty to take the specific measures set out in the Regulations, and technical guidance on the measures to be taken by large and medium-sized providers set out in the Telecoms Security Code.
- 3.36 As previously noted, the primary focus of the Telecoms Security Act framework is on measures that operators are expected to take to secure their networks from malicious signalling from external sources, i.e. incoming signalling traffic. In contrast, the misuse of an operator's GT relates to outbound signalling, i.e. malicious signalling originating from the GT, typically targeting other networks.
- 3.37 We recognise that the Telecoms Security Code includes guidance about such outbound signalling in the technical guidance concerning numbering resources that are made available

to third parties for signalling, such as leased GTs.<sup>64</sup> It explains that lessors are responsible for lessees' signalling activities including any security implications. However, in contrast to other aspects of signalling security, the Code does not identify specific measures that large and medium-sized providers are expected to take to address the security implications of activities such as GT leasing (for example, the Telecoms Security Code does not set out technical controls to restrict the types of signalling message that lessees can transmit).

- 3.38 We also note that while the security duties apply more broadly, the Telecoms Security Code applies only to large and medium-sized providers in the UK and does not apply to small providers (Tier 3 Providers – those with relevant turnover below £50m). This tiering is material because the evidence we have gathered indicates that some of the lessors we are aware of may be classified as Tier 3 Providers for the purposes of the Telecoms Security Code.
- 3.39 While providers are likely to be required to take at least some measures to address security risks arising from GT leasing to meet their security duties, we do not consider the Telecoms Security Act framework is likely to sufficiently address the different types of harms we have identified, in particular given the lack of specific measures that address the risks from GT leasing and the more limited scope of the Telecoms Security Code. We consider that a more comprehensive approach that applies to providers of all sizes is needed to address fully the harms we have identified.

## **Our General Conditions of Entitlement and Good Practice Guide**

- 3.40 As discussed in Section 2, Condition B1 of our General Conditions requires communications providers to comply with various rules relating to numbering. In particular:
- a) B1.6 requires communications providers to ensure the effective and efficient use of numbers which includes ensuring numbers (including GTs) are not misused.
  - b) B1.8 requires communications providers to take all reasonably practicable steps to secure their customers comply with the General Conditions (including B1.6) in relation to their use of numbers.
- 3.41 Our Good Practice Guide sets out the steps we expect communications providers to take to help prevent telephone numbers being misused when they are sub-allocating numbers (to other operators) or assigning numbers to business customers to address the risk of numbers being misused, including to ensure compliance with General Conditions B1.6 and B1.8.
- 3.42 General Condition B1.3 also prohibits the use of telephone numbers by communications providers unless that number is currently allocated by Ofcom.
- 3.43 We have set out below whether and how our existing General Conditions may be effective in addressing any of the harms we have identified above.

### **Misuse of Global Titles by third parties**

- 3.44 We consider that General Condition B1.8 (in combination with B1.6) would be applicable in the event a communications provider leases a GT to a third party and that third party misuses the GT. These General Conditions could therefore potentially be relied on to address

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<sup>64</sup> DCMS, Dec 2022. Telecommunications Security Code of Practice, technical guidance measure M3.08.

the current and potential harms we have identified from misuse associated with GT leasing by third parties.

- 3.45 As discussed in Section 2, the Good Practice Guide specifies that operators should take various steps including:
- Undertake due-diligence checks before sub-allocating or assigning numbers including ‘know your customer’ checks, enquiries about the intended use of the numbers and assess the risk of misuse.
  - Regularly reassess the risk of misuse and monitor for evidence of misuse.
  - Investigate incidents of suspected misuse and take action to prevent further incidents of misuse, including where appropriate withdrawing the sub-allocation or assignment.
  - Ensure that the measures applied reflect the risk of misuse associated with the intended use of the numbers.
- 3.46 The measures set out in the Good Practice Guide are generally applicable to GT leasing (as it is a form of number sub-allocation) and lessor compliance with it could in principle help to reduce the risk of misuse of leased GTs. However, our provisional view is that it is too general in its current form to be effective in addressing the risk of misuse associated with GT leasing by third parties. This is because the Good Practice Guide is currently focused on preventing numbers being sub-allocated or assigned to businesses and individuals that use them to facilitate scams; it does not contain any specific guidance on measures that would reduce the risk of misuse of leased GTs, such as:
- Detailed enquiries to establish that a prospective lessee genuinely intends to provide a service that requires a leased GT.
  - Technical measures such as lessor routing and real time technical controls to restrict signalling to agreed message types.
  - Proactive monitoring of lessees’ signalling traffic for misuse and supporting measures such as signalling data retention.
- 3.47 We also note that the Good Practice Guide was published in November 2022, and we have seen evidence of continuing harms from the misuse of GTs since that date.
- 3.48 While the guidance in the Good Practice Guide is applicable to GT leasing, and lessor implementation could in principle reduce the risk of misuse of GTs, we provisionally consider that relying on B1.6 and/or B1.8 (and our Good Practice Guide) in their current form is not sufficient to address the harms from GT leasing due to their misuse by third parties.
- 3.49 For the same reasons, we do not consider relying on B1.6 and/or B1.8 (and our Good Practice Guide) in their current form are sufficient to address the harms from the creation and misuse of GTs from sub-allocated numbers.
- 3.50 In Section 4, we consider whether the development of guidance that specifically addresses GT leasing would be an effective measure to address the harms we have identified from GT leasing.

### **Misuse of Global Titles by range holders**

- 3.51 As noted above, we have identified misuse of GTs by range holders where the source of the malicious signalling is a number range holder itself, which may be in connection with the provision of a service to a customer.

- 3.52 If malicious signalling arises from a range holder's direct use of their own GT, then we do not consider they would be using the relevant telephone number effectively or efficiently as required by General Condition B1.6. We could therefore make use of condition B1.6 to address any malicious signalling arising directly from a range holder and we are making clear that we would be prepared to make use of these powers in the context of this form of misuse of GTs. A potential example of this type of malicious signalling is where a range holder provides a service identifying the location of a subscriber of another network without that subscriber's knowledge.
- 3.53 We also consider that a range holder's failure to take reasonably practicable steps to prevent misuse when providing a service to a customer (using a GT as an input) that has the potential to generate malicious signalling, could be in breach B1.8 (in combination with B1.6). For example, the range holder may provide a service that provides the customer with application programming interfaces (APIs) that enable it to generate SS7 signalling message indirectly. In this case, the service provided by a range holder may, on the face of it, have a legitimate purpose, but is also capable of being used to generate malicious signalling. Malicious signalling may arise because the range holder has taken insufficient steps to prevent the misuse, such as technical controls, Know Your Customer checks and checks on the intended use of the service.
- 3.54 Our Good Practice Guide sets out the steps we expect providers to take to help prevent telephone numbers being misused, including to ensure compliance with General Conditions B1.6 and B1.8. We note that the Good Practice Guide is focused on preventing misuse of sub-allocated and assigned numbers and is silent on GT misuse. Some of the measures it sets out could, however, be relevant to addressing the risk of misuse by a range holder when providing a service to a customer (using a GT as an input) that has the potential to generate malicious signalling.
- 3.55 In Section 4, we discuss whether development of supplementary guidance may be necessary to provide clarity to stakeholders on the types of steps they are expected to take to ensure compliance with General Conditions B1.6 and/or B1.8 when providing a service to a customer (using a GT as an input) that has the potential to generate malicious signalling.

### **Misuse arising from the creation of Global Titles from numbers that have not been allocated for use**

- 3.56 As noted above, we have identified harm associated with the creation and misuse of GTs from numbers that have not been allocated for use.
- 3.57 The General Conditions prohibit the use of numbers that have not been allocated. In particular, General Condition B1.3 prohibits the use of telephone numbers by communications providers unless that number is currently allocated. These rules apply in relation to the creation and use of GTs from numbers that have not been allocated in the same way that they apply to the use of other telephone numbers that have not been allocated for use.
- 3.58 We consider we can rely on General Condition B1.3 in the event of the creation and misuse of GTs from numbers that have not been allocated. We therefore consider our existing rules are sufficient to address misuse by communications providers arising from the creation of GTs from numbers not allocated for use.

## Misuse of Global Titles by operators allocated numbers

- 3.59 Our General Conditions only apply to communications providers (which is defined in the General Conditions as a person who provides an Electronic Communications Network or an Electronic Communications Service).<sup>65</sup> We have therefore considered the extent to which misuse of GTs may arise from an operator that is not a communications provider and who may not therefore be subject to our General Conditions.
- 3.60 We consider that the use of GTs in specific scenarios may not always constitute the provision of an electronic communications network or service and therefore persons using GTs might not always be considered a communications provider within the scope of General Condition B1. For example:
- a) In its most basic form, and as explained in Section 2, GT leasing is simply a commercial agreement to allow a third-party to use a GT. While we are not aware of this form of GT leasing currently occurring, we understand lessee-only routing can occur (i.e. where signalling traffic associated with a leased GT is not routed via the lessor's network) and the lessor does not provide any other facility that is likely to make them a communications provider within the scope of General Condition B1.
  - b) Where a range holder misuses their own GT (e.g. to carry out malicious signalling activities), there is a possibility that in certain scenarios they may not be considered to be providing any form of electronic communications service or otherwise fall within the definition of the communications provider within the scope of General Condition B1.
  - c) An operator may have been a communications provider but then ceases to be a communications provider for whatever reason.
- 3.61 For these reasons, we do not consider our existing General Conditions are sufficient to address the risk of misuse of GTs by operators that may not be considered a communications provider. We have separate powers in section 59 of the Act that allow us to impose numbering rules on operators that are not communications providers but that have been allocated numbers, including through sub-allocation under the General Conditions. We discuss in Section 4 whether we consider it appropriate to impose new numbering rules under section 59 of the Act (which correspond to any General Conditions we intend to rely on address the harms we have identified).
- 3.62 In summary, while our existing General Conditions and the Good Practice Guide could be used to address aspects of the harms we have identified above, they would not be sufficiently effective in addressing all of the types of harms we have identified and meeting our objective to significantly reduce the misuse of UK GTs.

## The GSMA Global Title Leasing Code of Conduct

- 3.63 As discussed in Section 2, the GSMA has published the GSMA Code in response to concerns about unauthorised use of leased GTs.<sup>66</sup> The GSMA Code strongly recommends that its

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<sup>65</sup> The terms Electronic Communications Network and Electronic Communications Services are also defined in our General Conditions.

<sup>66</sup> GSMA, 2023. [FS.52 Global Title Leasing Code of Conduct](#).

members do not lease GTs and has asked members that continue to lease GTs to comply with its voluntary code of conduct designed to minimise the risk of harm.<sup>67</sup>

- 3.64 The GSMA Code contains best practice guidance for lessors that are designed to minimise the risk of misuse of leased GTs. It includes the following requirements:
- Due-diligence requirements that are intended to ensure that lessors undertake know-your-customer checks on prospective lessees and their proposed use of GTs prior to contractual engagement and periodically thereafter.
  - A requirement on lessees to route their traffic via the lessor's network, together with a requirement to retain signalling traffic, which is intended to ensure that lessors have full visibility of lessees' traffic and can investigate suspected signalling abuses.
  - A requirement on lessors to apply real-time controls which is intended to limit lessees' use of signalling to their stated use case(s).
  - A requirement to participate in threat intelligence activities which is intended to help improve visibility of signalling abuses.
- 3.65 If applied fully and comprehensively, these measures should reduce the likelihood of malicious signalling occurring and improve the visibility of lessees' signalling. This could therefore improve the security of GT leasing, particularly when compared with the arrangements that have been prevalent under which lessees often had unrestricted access to SS7 signalling and were not required to route their traffic via their lessor.
- 3.66 However, as a trade association, GSMA has no power to compel its members to comply with the GSMA Code. Consequently, there is a risk that even if the GSMA Code were widely adhered to, a proportion of lessors may not implement it or implement only parts of it.
- 3.67 This concern appears to be borne out by the information we have gathered. Our understanding is that no GSMA member has publicly declared<sup>68</sup> its compliance with the GSMA Code and that only Deutsche Telekom<sup>69</sup> has declared its intention to do so.
- 3.68 Furthermore, as we discuss in more detail below, responses to our Lessor Information Request indicate that of the seven lessors that we identified, three had not implemented the GSMA Code at all, two said they had implemented parts of it and one was implementing it.
- 3.69 Moreover, the technical measures in the GSMA Code do not completely prevent leased GTs from being misused, in particular because:
- Some signalling abuses utilise message types required for the stated use case and cannot easily be blocked by real-time technical controls that limit signalling to a particular use case.
  - Relatedly, it is necessary to deploy and maintain sophisticated proactive monitoring techniques to detect patterns of abusive signalling and take effective action in response to any instance of detected abuse.

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<sup>67</sup> The GSMA states that penetration testing may require leased GTs. It also excludes outbound roaming and network extensions from the scope of the GSMA Code even though leased GTs are sometimes used for this purpose.

<sup>68</sup> GSMA, [GT Leasing Code of Conduct – Signatories and Supporters](#).

<sup>69</sup> Deutsche Telekom announced this publicly at the Mobile World Congress in February 2024.

<https://commsrisk.com/deutsche-telekom-commits-to-global-title-leasing-code-that-stops-phone-spies/>.

3.70 In summary, the measures set out in the GSMA Code, if applied fully and comprehensively, should reduce the risk of signalling abuse occurring and improve the visibility of lessees' signalling. However, our provisional view is that the GSMA Code is unlikely to be fully adopted or adopted sufficiently widely by GT lessors to address the different types of harms we have identified and meet our objectives to effectively address the misuse of GTs.

## Control measures applied by Global Title lessors

3.71 We have assessed the responses to our Lessor Information Request in order to determine the extent to which lessors have implemented policies and processes for preventing, monitoring and detecting the misuse of leased GTs (including technical measures they apply to minimise the risk of unauthorised signalling) and whether they had implemented the GSMA Code. See Annex 9 for further details of our analysis of the responses we received.

3.72 In summary, we found that most lessors have some form of risk management policies, due-diligence measures and technical measures to reduce the risk of unauthorised signalling by their lessees. However, there were significant differences in the overall level of risk deterrence, particularly in relation to the level of scrutiny applied to due-diligence checks on prospective lessees and ongoing monitoring of lessees' signalling.<sup>70</sup> To some extent, these differences are reflective of the overall scale of lessors' leasing businesses – lessors with few lessees tended to have fewer controls.

3.73 We further noted that the four largest lessors (by volume of lessees) were all associated with malicious signalling in the Enea Report, including [redacted] which appears to have the most comprehensive due-diligence measures and technical controls. This could therefore reflect the inherent difficulties for lessors to detect and address misuse of GTs by lessees.

3.74 We also asked lessors whether any of their leased GTs were sub-leased. Five lessors indicated that none of their GTs were sub-leased. One lessor [redacted] stated that some of its GTs were sub-leased because it had [redacted] that leases some of its GTs and that as a result, those GTs were now sub-leased by [redacted] to its customers. This lessor noted that its contract requires [redacted] to undertake due diligence measures and to route all traffic via the lessor's network for active policing and control.<sup>71</sup>

3.75 Finally, none of the lessors had fully implemented the GSMA Code according to their responses to the Lessor Information Request.<sup>72</sup>

3.76 As noted above, there were significant differences in the control measures applied by lessors and even those lessors with the most comprehensive controls are associated with malicious signalling traffic. Indeed, the clandestine nature of GT misuse means there are inherent

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<sup>70</sup> In particular, we note that the only lessor we identified as carrying out no due diligence checks before contracting to provide leased GTs or an initial risk assessment of potential lessees was a UK lessor, [redacted]; the only lessors we identified as carrying out no ongoing or periodic risk assessment of lessees were both UK lessors, [redacted] and [redacted]; and the only lessors we identified as having no processes to revoke or suspend leased GTs in connection with misuse were UK lessors, [redacted] and [redacted].

<sup>71</sup> [redacted] response dated 13 February 2024 to the Lessor Information Request.

<sup>72</sup> Three lessors had not implemented any part of the GSMA Code and we note that two of those lessors are UK lessors, namely [redacted] and [redacted]. See, more widely, [redacted] responses dated 16 February 2024 and 3 May 2024, [redacted] responses dated 13 February 2024 and 3 May 2024, [redacted] responses dated 16 February 2024 and 3 May 2024, [redacted] responses dated 27 February 2024 and 2 May 2024, [redacted] responses dated 13 February 2024 and 1 May 2024, [redacted] responses dated 13 February 2024 and 3 May 2024 and [redacted] response dated 16 February 2024 to the Lessor Information Request.

limitations in the ability of lessors to implement, monitor and enforce effective controls to prevent misuse. Our provisional view is that the measures implemented by lessors are not therefore sufficient to address the different types of harms we have identified and meet our objectives to address the misuse of GTs.

## **We consider that intervention is required to address the evidence of harm**

- 3.77 For the reasons set out above, our provisional view is that the Telecoms Security Act framework, GSMA Code and measures taken by lessors are not sufficient to address the different types of harms we have identified and to meet our objectives to address the misuse of GTs.
- 3.78 We recognise that our existing General Conditions (in particular General Conditions B1.3, B1.6 and B1.8) may be sufficient to address some of the harms we have identified, in particular in relation to misuse of GTs by range holders and the creation and misuse of GTs from numbers not allocated for use (supplemented by new guidance, where considered necessary). We do not, however, consider our existing General Conditions are sufficient to address the harms arising from misuse of GTs by third parties or misuse of GTs by operators allocated numbers that are not communications providers.
- 3.79 We therefore provisionally conclude that further intervention is required to address the harms we have identified. We set out our proposals on how to reduce the harms associated with GT leasing and misuse in Section 4.
- 3.80 In putting forward our proposal to intervene, we recognise that malicious signalling originates from GTs around the world. This means that measures to combat these attacks in any single country will not alone completely address the harms associated with the misuse of GTs. However, as discussed above, we understand that GTs created from +44 number ranges are one of the most significant and consistent sources of malicious signalling worldwide. This could partially be explained by +44 GTs having generally been assumed to be relatively trustworthy by international operators (which means that signalling messages are less likely to be blocked). As such, we consider that our intervention in relation to UK GTs could contribute significantly to a reduction in harm for UK and international citizens, thereby leading to significant benefit to these consumers.
- 3.81 Furthermore, we understand that other governments and regulators across the world are also considering whether actions are needed to prevent the misuse of GTs. For example, the US Federal Communications Commission has recently sought comments on the implementation and effectiveness of security measures to prevent the use of the SS7 signalling protocol (including GT leasing) to track the location of consumers through their mobile devices.<sup>73</sup>
- 3.82 Ofcom will continue to work with other regulators to inform and support other interventions to tackle misuse of GTs. This will include engaging specifically with each of the telecoms regulatory authorities in the Crown Dependencies, to discuss how we can work together to prevent misuse of GTs created from +44 numbers allocated to operators in the Crown

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<sup>73</sup> Federal Communications Commission, March 2024. [Public Safety and Homeland Security Bureau Requests Comment on Implementation of Measures to Prevent Location Tracking via the Diameter and Signalling System 7 Security Protocols.](#)

Dependencies. This could further contribute to a reduction in harm for UK and international citizens.

## 4. Our proposals and impact assessment

- 4.1 Our analysis in the preceding section indicates that the misuse of GTs created from +44 numbers has resulted in actual and potential harm to UK and international citizens, and this will likely continue without any significant intervention. In this section we:
- discuss policy options that could address harm arising from the misuse of UK GTs;
  - assess the impact of our proposals on relevant stakeholders; and
  - provisionally conclude on whether our proposals are appropriate and proportionate.
- 4.2 We set out the legal tests we need to satisfy and how we intend to enforce our proposals in Section 5.
- 4.3 As set out in Section 2, our objectives in determining our approach to GTs and our proposals for new regulations are as follows:
- significantly and effectively reduce the misuse of UK GTs and the associated harms to UK and international citizens;
  - improve the transparency and accountability of operators that use UK GTs; and
  - support the effective function of the UK telecommunications sector including by promoting network security and ensuring best and efficient use of telephone numbers.

### Policy options to address misuse of Global Titles

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- 4.4 We have identified three sources of harm arising from the misuse of UK GTs in Section 3:
- Misuse of GTs by third parties** – this includes malicious signalling that originates from third parties that lease their GTs directly from number range holders or sub-lease GTs from lessees and third parties that create their own GTs from sub-allocated numbers.
  - Misuse of GTs by number range holders** – this includes malicious signalling that originates directly from number range holders themselves, which may be in connection with the provision of a service to a customer (using a GT as an input).
  - Creation and misuse of GTs from numbers that have not been allocated for use** – this includes malicious signalling that originates from GTs that were formed from unallocated number ranges.
- 4.5 In the following paragraphs, we explore potential policy options to address the harm for each of the sources of harm above before provisionally concluding on our preferred options.

### Addressing misuse of Global Titles by third parties

- 4.6 In Section 3, we presented evidence indicating that GTs obtained by third parties from number range holders are a main source of malicious signalling and a cause of significant harm to UK and international citizens.
- 4.7 In particular, our analysis of +44 GTs associated with malicious signalling activity from the Enea Report and GTs identified from responses to our Lessor Information Request in Section 3 indicated that a large proportion of these GTs have been leased out to third parties. We

also understand that some lessees have gone on to sub-lease their GTs, and this could be another source of malicious signalling.<sup>74</sup>

- 4.8 In addition, we have also identified some malicious signalling activity from GTs that has not been directly attributed to any number range holder and/or lessor. It is possible that some of the malicious signalling could be derived from GTs that have been created from number ranges that have been sub-allocated to third parties.
- 4.9 Given that we have identified evidence that this harm is arising, and has the potential to arise, as a result of misuse of UK GTs, we have considered policy options to address the harm and we discuss these in more detail below. We then provisionally conclude on the most appropriate and proportionate policy option to meet our objectives.

### **A ban on Global Title leasing will significantly reduce harm**

- 4.10 A ban on GT leasing would prevent lessors (including current and potential future lessors) from leasing their GTs to third parties.<sup>75</sup> This should therefore significantly reduce the degree and risk of harm as it prevents existing and potential bad actors from accessing GTs by leasing them from number range holders (or sub-leasing from lessees).<sup>76</sup>
- 4.11 This proposal would provide clarity to stakeholders and is relatively simple for us to enforce as it would make it clear (i) that mobile number range holders are not allowed to lease their GTs to third parties; and (ii) who the obligations are imposed on. The proposal would therefore improve the transparency and accountability of operators that use GTs.

### **A complementary ban on creating Global Titles from sub-allocated numbers should further reduce the risk of harm**

- 4.12 Given the risk of GTs being created from sub-allocated numbers and then misused, we consider that implementing additional rules that ban GTs from being created from sub-allocated numbers should further reduce the risk of misuse by third parties.
- 4.13 This would complement the ban on GT leasing as it should prevent bad actors that have previously used leased GTs from designating any sub-allocated numbers they hold (or might seek) as GTs. It would instead require any operator wishing to use GTs to apply to Ofcom directly for their own number ranges.<sup>77</sup>

### **Guidance on Global Title leasing would not be effective in significantly reducing the degree of harm**

- 4.14 As an alternative to the above, we have considered whether we could rely on the existing General Conditions in B1.6 and B1.8 that apply to the allocation, adoption and use of

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<sup>74</sup> The original owners of these number ranges (lessors) are likely to have even less visibility over how their GTs are used by these sub-lessees and may therefore find it more challenging to detect and prevent any misuse. It also further exacerbates the challenges faced by Ofcom in having visibility of malicious signalling and potentially holding the relevant parties responsible.

<sup>75</sup> This proposal does not prevent number range holders from creating and using their own GTs for the provision of mobile services so long as they do not misuse their GTs.

<sup>76</sup> In particular, it should prevent harms from lessors such as [3<], which has the second highest numbers of lessees, and whose GTs have been associated with malicious activities including in the Enea Report and more widely.

<sup>77</sup> We would, as part of the application process, scrutinise the applications, thereby further reducing the risk of misuse.

numbers<sup>78</sup>, and supplement this with new guidance setting out the steps we expect operators to take when leasing GTs to prevent them from being misused.<sup>79</sup> We would take this guidance into account when considering whether an operator may be in breach of the General Conditions.

- 4.15 Such guidance could draw on the approach taken in the Good Practice Guide, which we consider contains some measures that should be applicable to the leasing of GTs. The Guide could also draw on some of the 'Know Your Customer' (KYC) / contractual requirements on lessors within the GSMA Code, which are designed to reduce the risk of bad actors accessing and misusing GTs. Unlike the current Good Practice Guide, which does not reference GT numbers or the practice of leasing GTs, a new guide could focus specifically on the responsibilities of range holders when leasing GTs.
- 4.16 A new Guide on GT Leasing for lessors could set out the following requirements:
- Due diligence checks by lessors on potential lessees before leasing GTs.
  - Lessors to take steps such as periodic risk reviews of lessees to ensure continued compliance.
  - Lessors to respond to incidents of misuse of GTs by lessees.
  - Lessors to provide clear information to other networks on leased GTs and lessees.
  - Prohibiting the sub-leasing of GTs by lessees.
- 4.17 However, we consider that this approach, compared to a ban on leasing, would not be effective in significantly reducing the risk and degree of harm. We explain our reasoning below.

#### **We have identified evidence of harm despite lessors implementing controls to prevent misuse of Global Titles**

- 4.18 As discussed in Section 3, our Lessor Information Request indicated that each of the lessors have some controls in place to monitor, detect and prevent the misuse of their GTs by lessees. These controls include KYC / due diligence checks, contractual controls on lessees and technical measures relating to the routing of signalling. However, despite the apparent prevalence of both KYC and technical controls, we have seen evidence suggesting +44 GTs continue to be a significant source of malicious signalling. Indeed, the lessor ([X]) we consider has the most comprehensive due diligence measures and technical controls was still associated with malicious signalling in the Enea Report.
- 4.19 We found that, even where lessors have robust contractual and technical controls in place, there are inherent challenges for lessors to monitor traffic from a leased GT and take action when misuse is detected. In addition, it may not be possible for the lessors to detect instances of sub-leasing, as indicated by a response<sup>80</sup> to our Lessor Information Request.

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<sup>78</sup> B1.6 states "Where Telephone Number have been Allocated to the Communication Provider, that provider shall secure that such Telephone Numbers are Adopted or otherwise used effectively and efficiently". B1.8 states that "The Communications Provider shall take all reasonably practicable steps to secure that its Customers, in using Telephone Numbers, comply (where applicable) with the provisions of this Condition, the provisions of National Number Plan and the Non-provider Numbering Condition."

<sup>79</sup> As explained in Section 3, while we consider the existing Good Practice Guide is generally applicable to GT leasing (as it is a form of number sub-allocation), it contains no reference to GTs. We consider a clearer and more transparent option would be to produce new guidance focused on GT leasing.

<sup>80</sup> [X] indicated that they believe it is not possible to directly detect instances of sub-leasing.

This suggests that there is still a significant risk that bad actors could get access to UK GTs and use them for malicious signalling, even if we introduced a Guide on GT Leasing.

#### **There are practical challenges to monitoring the effectiveness of a Guide on Global Title Leasing**

4.20 We are mindful that there would be significant practical and timing challenges associated with monitoring whether GTs have been misused and whether lessors are implementing the practices we might include in a Guide on GT Leasing. The potential targets for signalling attacks include networks (and their subscribers) across the world and we would have limited direct access to intelligence outside the UK regarding specific instances of malicious signalling relating to a specific entity, particularly in the immediate period following such abuses. This could hinder or significantly delay any enforcement action we might take against a lessor for GT misuse. We would need to establish that the misuse of their GTs has arisen and that this was because of the lessor's failure to ensure that it has taken reasonably practicable steps to ensure its lessees do not misuse the GTs, including carrying out the relevant measures in such a guide.

#### **We provisionally conclude that banning GT leasing, alongside a ban on creating GTs from sub-allocated numbers, is the most effective option**

- 4.21 We have set out potential options above that could, to different degrees, address the harm we have identified due to the misuse of GTs by third parties. However, we consider that relying on existing regulation, supplemented by a Guide on GT Leasing, would not be effective in significantly reducing the harms due to the clandestine nature of GT misuse and the inherent limitations in the ability of both lessors and Ofcom to implement, monitor and enforce controls to prevent misuse.
- 4.22 These issues are a particular concern given the widespread evidence of misuse of +44 GTs, the evidence of the resulting harm, including the fact that severe and irreparable harm can occur from a single instance of misuse.
- 4.23 We therefore provisionally conclude that a ban on GT leasing, alongside a ban on creating GTs from sub-allocated numbers, would meet our objective of significantly reducing the risk of harm that arises from the misuse of GTs by third parties. These two bans together would enhance the transparency and accountability of operators that use GTs, and significantly reduce the potential for misuse. This ban will be subject to the narrowly scoped exemptions explained in paragraphs 4.26 to 4.30 below.
- 4.24 In order to ensure that all operators who might have access to GTs through their number allocations are not able to lease GTs (regardless of whether or not they may be considered a communications provider within the scope of General Condition B1), we propose to introduce similar rules for all operators allocated numbers by amending the Numbering Condition Binding Non-Providers.<sup>81</sup>
- 4.25 We note that our proposal to ban GT leasing (except in specified cases) will affect the application of General Condition B1.2(b).<sup>82</sup> However, we explain in Section 5 why we consider that our proposals are necessary and meet the relevant legal tests.

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<sup>81</sup> We explain the basis for this proposal in more detail in Sections 3 and 5.

<sup>82</sup> General Condition B1.2 states that: "A Communications Provider shall not Adopt Telephone Numbers from Part A of the National Telephone Numbering Plan unless: (a) the Telephone Numbers have been Allocated to the Communications Provider; or (b) the Communications Provider has been authorised (either directly or

## **We provisionally conclude that exemptions may only be required for intra-group use and use by suppliers**

- 4.26 We recognise that the GSMA excludes certain services and use cases from the requirements of the GSMA Code. We are not planning to incorporate similar exemptions to the GSMA into our proposed ban on GT leasing, as we consider that the exemptions are likely to be difficult to monitor and may create a risk that bad actors are able to access GTs for uses beyond the stated exemptions. We also note that the GSMA has stated that there generally are alternatives to GT leasing, and it has urged its members against leasing.
- 4.27 We have considered, in particular, whether to allow a limited exemption from our proposed ban on GT leasing for the use case of penetration testing. We are however mindful that there is risk that any exemption that allows third parties to access GTs and send signalling to other networks (i.e. not the owner of the GT) could provide a loophole for bad actors to exploit and continue to engage in malicious signalling.
- 4.28 We recognise however that mobile operators sometimes make their GTs available to companies within the same corporate group (e.g. where a service is provided within a corporate group) and to suppliers (e.g. where a supplier hosts the core network elements used to provide a service to the mobile operator’s customers). We consider that such use is unlikely to give rise to a risk of harm and we therefore propose to exclude these cases from the proposed ban on GT leasing.
- 4.29 To minimise the risk that the exemption for suppliers might be used to circumvent the ban on GT leasing, we propose to limit the exemption to the provision of services to the operator that is authorising the use of their GT i.e. use by the supplier for any other purpose would fall outside the scope of the exemption.
- 4.30 We would welcome input from stakeholders regarding our proposed approach to exemptions. In particular, we would consider any evidence that suggests GT leasing is a necessary part of facilitating legitimate services and which might suggest that a tightly limited exemption could be appropriate and if so, how the risk of harms could be managed.

## **Addressing misuse of Global Titles by number range holders**

- 4.31 To address the misuse of GTs by number range holders, we propose to:
- a) Issue new supplemental guidance on the types of steps range holders are expected to take when providing a service to a customer (using a GT as an input) that has the potential to generate malicious signalling.
  - b) Implement a new Numbering Condition Binding Non-Providers that ensures current General Conditions relating to misuse of GTs by communications providers apply to all operators that have been allocated numbers.
- 4.32 We explain our reasons for this below.

## **We have identified potential sources of harm due to the misuse of Global Titles by number range holders**

- 4.33 We have identified evidence of harm arising from GTs that are owned by number range holders (including UK range holders) who did not tell us that they are lessors in their

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indirectly) to Adopt those Telephone Numbers by the person Allocated those Telephone Numbers.” Our proposal to ban GT leasing (subject to applicable exemptions) will therefore affect the application of B1.2(b).

responses to the January 2023 Information Request. This could indicate that the source of the malicious signalling is a number range holder itself which may be in connection with the provision of a service to a customer.<sup>83</sup>

- 4.34 As explained in Section 3, if malicious traffic arises from a range holder's direct use of their own GT, then we do not consider they would be using the relevant telephone number effectively or efficiently as required by General Condition B1.6. We could therefore make use of condition B1.6 to address any malicious signalling traffic arising directly from a range holder.
- 4.35 We also consider that a range holder's failure to take reasonably practicable steps to prevent misuse when providing a service to a customer (using a GT as an input) has the potential to generate malicious signalling, could be in breach of B1.8 (in combination with B1.6). Malicious signalling may arise because the range holder has taken insufficient steps to prevent the misuse, such as technical controls, KYC checks and checks on the intended use of the service.
- 4.36 Notwithstanding this, our provisional view is that in order for Conditions B1.6 and B1.8 to be effective to address the harm we have identified, it is appropriate to supplement them with supplemental guidance. This will make clear that in order to comply with these obligations, we would expect range holders to take appropriate steps to prevent the misuse when providing a service to a customer (using a GT as an input) that has the potential to generate malicious signalling.<sup>84</sup>
- 4.37 Our Good Practice Guide sets out the steps we expect providers to take to help prevent telephone numbers being misused, including to ensure compliance with General Conditions B1.6 and B1.8. We note that the Good Practice Guide is focused on preventing misuse of sub-allocated and assigned numbers and is silent on GT misuse. Some of the measures it sets out could, however, be relevant to addressing the risk of misuse by a range holder when providing a service to a customer (using a GT as an input) that has the potential to generate malicious signalling.

### **We therefore propose supplementary guidance and to implement a new Numbering Condition Binding Non-Providers to address this harm**

- 4.38 In order to ensure that our expectations in relation to GT misuse and the obligations in B1.6 and B1.8 are transparent, we propose supplemental guidance, drawing on relevant aspects of the Good Practice Guide, on the steps a range holder should take when providing a service to a customer (using a GT as an input) that has the potential to generate malicious signalling.
- 4.39 In this supplemental guidance, we are proposing that where a range holder is providing a service to a customer (using a GT as an input) that has the potential to generate malicious signalling, we expect the range holder to take appropriate steps to prevent the misuse.

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<sup>83</sup> There may be an increased risk of range holder misuse of GTs if we implement a ban on GT leasing (alongside a ban on GTs being created from sub-allocated numbers) as bad actors may seek to circumvent that ban by requesting their own UK mobile numbers and assigning their own GTs for the purposes of malicious signalling or by offering services providing alternative means of accessing SS7 signalling. We would however, as part of the application process, scrutinise the applications, thereby further reducing the risk of misuse.

<sup>84</sup> We recognise that GTs play an important role in network signalling and are used to support the provision of various legitimate mobile services, so we do not want to prevent legitimate usage of GTs by range holders.

- 4.40 The nature and extent of the steps range holders will be expected to take will depend on what is considered appropriate in the specific circumstances, taking into account:
- a) the nature of the service it is providing;
  - b) the risk of malicious signalling;<sup>85</sup>
  - c) the customer the range holder is providing the service to;
  - d) knowledge of any previous malicious signalling carried out by that customer; and
  - e) that customer's intended use of the service.
- 4.41 At a minimum, we propose that range holders take reasonable steps to understand the customer that has requested a relevant service, and the risk of misuse, before providing the service. This includes KYC checks, checks on the intended use of the service, considering any indicators of a high-risk customer, recording the steps that have been taken and ensuring they are signed off by an appropriate senior manager.<sup>86</sup>
- 4.42 We also propose that, depending on the circumstances and the nature of the risk involved, range holders may also be expected to:
- a) Put processes in place to ensure continued compliance with General Condition B1.6 and prevent illegitimate use. This includes putting appropriate contractual controls in place in relation to the use of the relevant service and to ensure end-user customers are required to comply with B1.6; keeping risk assessments under review and considering routinely testing and/or monitoring specific risks associated with a particular customer.<sup>87</sup>
  - b) Put processes in place to appropriately respond to any incident where a customer is using a service (which uses the range holder's GT as an input) for an illegitimate purpose. This includes developing and maintaining a process for capturing and handling complaints and maintaining a record of any investigations, outcomes and action taken; taking appropriate action to investigate and resolve incidents of potential illegitimate use in a timely manner; and, as far as reasonably possible, preventing any further potential illegitimate use once they have been informed or have identified a potential concern.<sup>88</sup>
- 4.43 We propose that where a range holder is providing a service to a customer (using a GT as an input) that has the potential to generate malicious signalling, we expect them to take account of this new supplementary guidance to prevent misuse of their GTs and ensure compliance with General Conditions B1.6 and/or B1.8. We also propose that Ofcom will take this supplementary guidance into account when assessing whether a range holder may be in breach of B1.6 and/or B1.8.
- 4.44 If we decide to adopt this proposed supplemental guidance in its current or an amended form, we will explain in our statement how we plan to present this guidance in final form.
- 4.45 In order to ensure that all operators who might have access to GTs through their number allocations are not able to misuse their GTs (regardless of whether or not they may be considered a Communications Provider within the scope of General Condition B1), we also propose to introduce similar rules for operators allocated numbers by adding a new

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<sup>85</sup> We expect range holders to have regard to the use of abnormal signalling traffic types identified in the GSMA's [FS.11 publication - SS7 Interconnect Security Monitoring and Firewall Guidelines](#).

<sup>86</sup> These will be similar steps to those identified in Section 3 of our Good Practice Guide.

<sup>87</sup> These will be similar steps to those identified in Section 4 of our Good Practice Guide.

<sup>88</sup> These will be similar steps to those identified in Section 5 of our Good Practice Guide.

Numbering Condition Binding Non-Providers corresponding to B1.6 and B1.8.<sup>89</sup> We expect all operators allocated numbers to take the steps summarised above and for the proposed supplementary guidance to apply to all such operators.

## Addressing the creation and misuse of Global Titles from numbers not allocated for use

- 4.46 To address the creation and misuse of GTs from numbers not allocated for use, we propose to implement a new Numbering Condition Binding Non-Providers that ensures the current General Condition relating to unauthorised use of numbers applies to all operators that have been allocated numbers. We explain our reasons for this below.
- 4.47 As noted above, some of the malicious signalling originating from +44 GTs could result from bad actors creating and misusing GTs from numbers not allocated for use, including in relation to UK GTs. This could include where GTs are created from numbers that are not allocated for use (e.g. numbers withdrawn when an operator goes out of business).
- 4.48 As explained in Section 3, General Condition B1.3 prohibits the use of telephone numbers by communications providers unless that number is currently allocated. We consider we can rely on General Condition B1.3 in the event a communications provider creates and misuses GTs from numbers not allocated for use and we are making clear that we would be prepared to make use of these powers in the context of this form of misuse of GTs.
- 4.49 However, in order to ensure that all operators who might create and use GTs are prohibited from doing this if the numbers are not allocated for use (regardless of whether or not they may be considered a communications provider within the scope of General Condition B1), we propose to introduce similar rules by adding a Numbering Condition Binding Non-Providers corresponding to General Condition B1.3.<sup>90</sup>

## Our proposals

- 4.50 In summary, we propose to introduce the following regulations to address the misuse of GTs by third parties:
- a) Ban on GT leasing to third parties; and
  - b) Ban on third parties from creating GTs from sub-allocated numbers.<sup>91</sup>
- 4.51 In addition to the ban on leasing, we also propose to strengthen our current regulation to (a) address the misuse of GTs by number range holders and (b) address the creation and misuse of GTs from numbers that are not allocated for use:
- a) Misuse of GTs by number range holders:
    - i) Issue guidance on the types of steps range holders are expected to take when providing a service to a customer (using a GT as an input) that has the potential to generate malicious signalling.

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<sup>89</sup> We explain the basis for this proposal in more detail in Sections 3 and 5.

<sup>90</sup> We explain the basis for this proposal in more detail in Sections 3 and 5.

<sup>91</sup> We are also planning to implement a new Numbering Condition Binding Non-Providers that ensures these new rules apply to all providers.

- ii) Implement a new Numbering Condition Binding Non-Providers that ensures the current rules in the General Conditions relating to misuse of GTs by number range holders apply to all operators allocated numbers.<sup>92</sup>
  - b) Creation and misuse of GTs from numbers not allocated for use:
    - i) Implement a new Numbering Condition Binding Non-Providers that ensures the current rules in the General Condition relating to unauthorised access apply to all operators allocated numbers.<sup>93</sup>
- 4.52 We assess the impact of our proposals in the paragraphs below and we set out our specific implementation proposals in Section 5.

## Impact of measures to address Global Title misuse

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- 4.53 Under our regulatory principles, we will only intervene if we consider it appropriate and proportionate to do so. This is based on our duty under section 3(3)(a) of the 2003 Act to have regard to the principles under which regulatory activities should be proportionate and targeted only at cases where action is needed.
- 4.54 In the paragraphs below, we assess the likely impact of the measures (identified above) that we consider will be effective in significantly reducing the harms from GT misuse. We first discuss the likely impact of a ban on GT leasing and then discuss the likely impact of the additional measures.

## Impact of banning Global Title leasing

- 4.55 We have outlined above why we consider that banning GT leasing is an effective means of achieving our policy objectives. We have also explained why we consider the alternative option of introducing a Guide on GT Leasing would not be effective.
- 4.56 We now assess the impact of our proposal, including whether it will lead to significant adverse effects which are disproportionate to the policy objectives. We first discuss the benefits of banning GT leasing and then consider the potential impact on the affected parties.

### Benefits of banning Global Title leasing

- 4.57 For the reasons set out below, we consider that a ban on GT leasing would lead to significant benefits for UK and international citizens, and the UK telecommunications industry.

#### **Banning GT leasing will lead to significant benefits for both UK and international citizens**

- 4.58 In Section 3, we have identified evidence of harm arising from the misuse of leased UK GTs<sup>94</sup> and explained this has happened despite the deployment of a range of measures / controls by lessors. A ban on GT leasing would reduce the degree and risk of misuse by (i) stopping bad actors that currently access UK GTs through this route and prevent other bad actors

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<sup>92</sup> We are proposing a new Numbering Condition Binding Non-Providers corresponding to General Conditions B1.6 and B1.8.

<sup>93</sup> We are proposing a new Numbering Condition Binding Non-Providers corresponding to General Condition B1.3.

<sup>94</sup> In particular, it should prevent harms from lessors such as [3<], which has the second highest numbers of lessees, and whose GTs have been associated with malicious activities including in the Enea Report and more widely.

from doing so in the future; and (ii) prevent number range holders that do not lease their GTs from doing so in the future, thereby further reducing the potential number of GTs that could be accessed by bad actors. This could therefore significantly reduce the degree and risk of harm to UK and international citizens (including as consumers of telecommunications services).<sup>95</sup>

- 4.59 As discussed further below, a ban on GT leasing could likely mean that lessors / lessees will likely have to develop and/or use alternative provisioning arrangements based on other solutions. We recognise there may still be some risk of signalling-based attacks via these alternative arrangements, but we understand that restrictions placed on the use of these arrangements are more secure / effective than those placed on GTs. As such, we consider that the ban on GT leasing will still lead to a substantial reduction in malicious signalling and associated harm for UK and international citizens.
- 4.60 More generally, in light of the evidence of misuse of UK GTs we have identified in Section 3, we consider a ban on GT leasing will help us ensure the best use of telephone numbers, and encourage efficiency and innovation for that purpose, in line with our duties. It also aligns with our broader strategy to promote network security and resilience.

#### **Banning Global Title leasing will support the UK telecommunications industry**

- 4.61 Another important benefit from banning GT leasing would be the reduction in the frequency of security incidents involving UK networks. This could lead to further benefits in the following:
- a) It could strengthen the reputation of the UK telecommunications industry and support the integrity of UK telephone numbers, thereby supporting UK operators (including current lessors) in their negotiations of agreements with international carriers (such as SMS interworking agreements and roaming agreements) and reduce the chances that legitimate UK traffic is blocked in error. It would also foster trust for users knowing that their data and communications are secure with the UK networks.
  - b) It could ensure the smooth running of mobile networks within the UK (and across the world), thereby reducing the potential for service disruptions to these operators and their end users.
  - c) It could also reduce the potential costs for UK operators (including lessors) from having to address and handle any potential implications following incidents of GT misuse.

#### **Adverse impact of banning Global Title leasing on stakeholders**

- 4.62 We recognise that banning GT leasing will likely have an impact on a range of different parties and these include: (i) operators / range holders that lease their GTs (lessors); (ii) operators / businesses that use the leased GTs (lessees); and (iii) end users (consumers and businesses) that purchase services from the lessees. We discuss the impact on each type of party below.<sup>96</sup>

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<sup>95</sup> We note that the benefits of a ban may be greater for persons with certain political views (a protected characteristic under the Northern Ireland Act 1998) or religious beliefs (a protected characteristic under the Equality Act 2010 and the Northern Ireland Act 1998) than for consumers and citizens as a whole, as there may be a higher risk that they are targeted by malicious signalling facilitated by the misuse/leasing of GTs. We set out our public sector equality obligations in Section 2.

<sup>96</sup> This sub-section relies on the following responses to the Lessor Information Request: [redacted] dated 16 February 2024, [redacted] dated 13 February 2024, [redacted] dated 16 February 2024, [redacted] dated 27 February 2024, [redacted] dated 13 February 2024, [redacted] dated 13 February 2024 and [redacted] dated 16 February 2024.

## Adverse impact on lessors

- 4.63 Lessors currently generate revenue from leasing GTs. A ban on GT leasing will therefore result in the loss of these revenues. Although these revenues could currently be large for some lessors, the relevant net impact on lessors is likely to be significantly lower for the reasons below.
- 4.64 Firstly, we only consider revenues that are generated from legitimate use cases to be relevant for the purposes of our impact assessment. As discussed in Section 3, our evidence suggests that some leased GTs are being used for illegitimate purposes that leads to harm for UK and international citizens. This means that the loss of legitimate revenue due to the proposed ban on GT leasing may be lower than what is currently reported by the lessors.<sup>97</sup>
- 4.65 Secondly, we understand from responses to our Lessor Information Request that there is a general trend for lessors to move away from leasing GTs, with some lessors having already moved away from GT leasing due to security concerns.<sup>98 99</sup> We also note that others are already planning to move away from GT leasing or are no longer planning to add any more lessees:
- A lessor, [X], is planning to reclaim its sub-allocated GT [X]. This lessor [X] expects this transition to take place between August 2025 and February 2026.
  - A lessor, [X], also confirmed that it does not intend to add any more lessees on top of their single current existing lessee.

This therefore lessens the impact of the proposed ban for these lessors.

- 4.66 Thirdly, we note from GSMA's Code (see Section 3), and our own analysis (see Table 4.1 below) that alternative arrangements could be offered and/or developed by lessors to support lessees in continuing to provide most of the remaining use cases, instead of relying on GTs. Responses to our Lessor Information Request indicated that it is possible for lessors to develop these alternative arrangements, in particular, some lessors already offer alternative ways to support lessees' provision of A2P SMS services:
- One lessor [X] offers wholesale SMS and least cost routing via Short Message Peer to Peer (SMPP) SMS, as well as least cost routing via API.
  - Another lessor, [X], has migrated its messaging aggregation customers away from SS7 connectivity to an SMPP/API based alternative.

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<sup>97</sup> By way of example, one lessor [X] indicated that GT leasing accounts for a significant proportion of its profitability ([X] of their Earnings before Interest and Tax) but we consider that the potential loss of relevant revenue due to the ban on GT leasing for [X] will be lower than the reported figures as the Enea report indicated that GTs associated with this lessor have been one of the main sources of signalling-based attacks.

<sup>98</sup> A lessor, [X], reassessed its leasing of GTs and withdrew its GT based services for "virtual VLR", wholesale A2P SMS and the majority of its home location register (HLR) look-up services. These actions were taken "with the direct objective of removing the risks associated with leased GTs". [X] was the only lessor that is leasing GTs for private networks and stated that it shut down this legacy service in February 2024.

<sup>99</sup> A lessor, [X], stated that it recognised the potential risks of GT leasing, and has proactively undertaken steps to limit this risk through ceasing any legacy GT leasing that did not conform to approved use cases, such as retiring its SS7-based message aggregation services and limiting the GT leasing use cases to those supporting "Light" MVNO and Outbound Roaming Solutions.

This means that lessors could continue to generate revenue through these alternative arrangements, thereby lessening the overall impact of the proposed ban.<sup>100</sup> We recognise that some lessors may incur some costs to develop and migrate their customers to these alternative arrangements. However, given our understanding that some lessors already offer alternative arrangements and the GSMA's position that operators should not lease their GTs in the first place as alternative arrangements are available, we consider overall that the transition costs would likely be manageable given an appropriate implementation period.<sup>101</sup>

4.67 We consider that introducing an appropriate implementation period, before the ban on GT leasing comes into force, should also reduce the potential impact on lessors by providing them with additional time to develop and/or migrate lessees onto alternative arrangements. We discuss this in more detail below.

#### Adverse impact on lessees

4.68 Overall, we consider that the impact of the ban on GT leasing will likely have a limited overall impact on lessees. This is due to the availability of alternative arrangements from lessors and other commercial operators that should allow most lessees to continue to provide the use cases that are currently facilitated by GT leasing. Our analysis of alternative provisioning arrangements for use cases that were submitted as responses to our Lessor Information Request is summarised in the table below.

**Table 4.1: Use cases that rely on Global Title leasing and alternatives to support their provision**

Use case	Description of alternative
Authentication Services	Application programming interface (API) provided by a host MNO that provides the lessee with functionality to support the stated use case <sup>102</sup>
Least-cost Routing/Number Authentication	API provided by a host MNO or Short Message Peer to Peer (SMPP) <sup>103</sup> connection to a host MNO
Application to Person SMS (A2P SMS)	API provided by a host MNO or Short Message Peer to Peer (SMPP) protocol
Mobile virtual network operator (MVNO)	A hosted service provided by the host MNO (often referred to as a thin MVNO service)
Outbound Roaming Solution	GT Modification (changing the source or destination GT in the signalling connection control part (SCCP) layer of the SS7 message)

<sup>100</sup> We acknowledge in Section 4 below that there are some use cases that have less clear alternative provisioning arrangements, which could suggest that a ban on GT leasing could have a larger impact on any such lessors that generate a large proportion of revenue from these limited use cases. However, this may be less relevant for UK lessors as responses to our Lessor Information Request indicated, [§<].

<sup>101</sup> We did not receive reliable information from stakeholders on the exact level of costs in response to our Lessor Information Request. We recognise that these costs are likely to vary by lessor and smaller lessors may face a proportionately higher burden to develop / migrate onto alternative arrangements. However, as noted above, we consider overall that the transition costs would likely be manageable given an appropriate implementation period.

<sup>102</sup> An API is a set of software protocols that enable software applications to communicate with each other.

<sup>103</sup> SMPP is an industry standard protocol for the transmission of SMS messages.

Use case	Description of alternative
Penetration Testing	Remote access for the penetration tester to the target operator's test network
Communications Platform as a Service (CPaaS)	API or SMPP for A2P SMS functionality as above. Session Initiation Protocol (SIP) <sup>104</sup> based telephony interface provided by host MNO.

Source: Ofcom

4.69 Taking into account the alternative arrangements summarised above, we present below our provisional views on the potential adverse impact of the ban on GT leasing for lessees in relation to the main use cases:

- A2P SMS services.** A ban on GT leasing should have a limited impact on lessees that use GTs to provide A2P SMS services, as there are alternative arrangements that facilitate the provision of A2P SMS services that rely on API and SMPP. These arrangements are already available both from some current lessors and from other commercial operators. Indeed, as noted above, one lessor [X] indicated that it has already migrated its lessees to a SMPP-based alternative and charges the same price to these lessees as for its GT-based services.
- CPaaS (Communications Platform as a Service).** Responses to our Lessor Information Request indicated that [X] [X] lessee that is currently using GTs for this purpose. The impact on this lessee is likely to be limited as its lessor, [X], suggested that it can develop alternative arrangements for the lessee and the lessee will not experience any differences in its service. However, it noted in a subsequent clarification email<sup>105</sup> that the expected costs to the lessee are unknown and there may be transitional costs for the lessor [X] to develop / migrate the lessee to the new arrangement.
- Outbound roaming.** A ban on GT leasing will likely have a limited impact on these lessees as alternative arrangements exist in the form of GT modification services.<sup>106</sup> This is consistent with the Lessor Information Request response from [X] which indicated that address translation services could be used as an alternative arrangement, although it also noted a few downsides with this arrangement.
- Penetration testing.** We consider that the impact on these services is likely to be limited as we expect that the majority of penetration testing services could potentially be provided using alternative means that do not rely on GTs (e.g. via remote access to the target operator's test network). Furthermore, penetration testing is designed to test 2G and 3G networks, which means that the potential adverse impact of our proposal should reduce over time as the ability of operators to generate revenue through these services will fall in line with 2G and 3G networks being withdrawn across the world.
- Other services (authentication/location services, least cost routing and number authentication services).** We consider that the impact of a ban on GT leasing on these services is likely to be limited as alternatives that do not rely on GTs are available

<sup>104</sup> SIP is an industry standard signalling protocol that is used for call control in IP based telecoms networks.

<sup>105</sup> [X] email to Ofcom dated [X].

<sup>106</sup> This also requires the lessee to obtain their own number ranges.

through APIs. We also note that the GSMA's Open Gateway initiative has developed APIs for many of these use cases.<sup>107</sup>

- 4.70 We recognise that a ban on GT leasing could have a significant impact on 'thick MVNOs' that rely on GTs,<sup>108</sup> as these MVNOs may find it more challenging to switch to alternative arrangements. These MVNOs will have to either (i) obtain their own mobile numbers directly from Ofcom, form GTs and negotiate roaming agreements; or (ii) switch towards a 'thin MVNO' model that relies more on the host mobile network.<sup>109</sup> However, responses to our Lessor Information Request indicated that only a few small thick MVNOs that offer niche services may be adversely affected under our proposal, as the vast majority of MVNOs in the UK market are not reliant on leased GTs. Indeed, we note that the lessee [X] is [X] MVNO that is currently relying on leased GTs, but our proposal will likely have a limited impact on this lessee as its lessor [X] indicated that it is already planning to migrate the lessee [X] towards an alternative arrangement independent of any policy decision we might make.
- 4.71 Finally, we consider that allowing an appropriate implementation period before a ban on GT leasing comes into effect will help mitigate the impact on lessees as it provides them with time to migrate to alternative arrangements (see below).

#### **Adverse impact on end users**

- 4.72 We have also considered the impact of our proposal on residential and business end users that purchase services provided by lessees. We anticipate that the number of UK residential and business end users that could be affected by our proposal is unlikely to be very large given the information we have gathered regarding the business models of lessees.<sup>110</sup>
- 4.73 We consider that the overall impact on residential and business end users is likely to be limited as lessees that currently provide services to end users are likely to be able to migrate their GT-based services to alternative arrangements that do not rely on GTs. For instance, a business that is currently purchasing A2P SMS services from a lessee could potentially purchase these services based on an API instead from the same lessee or another commercial provider.<sup>111</sup>
- 4.74 We recognise that some business end users may face some short-term transitional costs in relation to migrating their systems to another service (e.g. re-contracting with another supplier and integrating new APIs), but we do not expect these costs to be significant. In addition, as discussed below, we consider that allowing a transition period before any ban on GT leasing comes into effect will also help to mitigate any short-term operational implications.

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<sup>107</sup> <https://www.gsma.com/solutions-and-impact/gsma-open-gateway/>.

<sup>108</sup> These are MVNOs that have their own core network components (such as HLR or a prepaid billing system).

<sup>109</sup> Thin MVNOs do not have their own core network components and instead use hosted services provided by an MNO partner.

<sup>110</sup> For example, only a small number of residential consumers purchase mobile services from those small number of "thick" MVNOs that rely on GTs.

<sup>111</sup> There is already a wide range of alternative providers of mobile services that do not rely on GT leasing. In the event a lessee provider were to cease providing the GT-based service, then their end users could move onto another commercial service that does not rely on GTs. For example, residential consumers should be able to switch their existing mobile service to another MNO / MVNO if their lessee ceases to provide the same service. Meanwhile, any businesses that currently rely on lessees for A2P SMS services should be able to move to alternative providers that make use of API / SMPP arrangements to provide these services.

## **We expect that the benefits of a ban on Global Title leasing will outweigh any adverse impacts on stakeholders**

- 4.75 We consider that a ban on GT leasing will effectively prevent bad actors from accessing leased (and sub-leased) UK GTs thereby significantly reducing misuse of these GTs and the degree and risk of harm to UK and international citizens. A ban on GT leasing would also support the UK telecommunication sector by reducing the frequency of security incidents and promote transparency by ensuring that only range holders could create and use GTs. It would further ensure the best and efficient use of telephone numbers in line with our duties. We therefore consider that the ban on GT leasing would satisfy the objectives that we have set out in Section 2.
- 4.76 We expect a ban on GT leasing to have a limited adverse impact on end users and most lessors / lessees. For end users, we understand that the number of users affected is unlikely to be large, and they will typically have access to other alternatives that do not rely on GT leasing. For lessees / lessors, we recognise that some stakeholders may be affected to a greater extent than others, but we note that the overall impact is likely to be limited given that most lessees / lessors could use alternative arrangements to provide the same legitimate services that relied on GT leasing. In addition, the implementation period (see below) should further reduce the burden of our proposal by providing the affected parties with time to move to alternative arrangements (if needed).
- 4.77 Overall, we expect the benefits from banning GT leasing to significantly outweigh the potential adverse impact on stakeholders that we have identified. As such, we consider that the proposed ban on GT leasing is both appropriate and proportionate to address the significant harm we have identified from the misuse of UK GTs.
- 4.78 Moreover, it is important to place our proposals within the wider context of the planned withdrawal of 2G and 3G services within the UK and the rest of the world over the next few years. As discussed in Section 3, we consider that the risk of harm through the withdrawal period is still significant and justifies taking action to reduce this risk of harm. The planned withdrawal does, however, mean that lessors / lessees will have to eventually move away from SS7-based signalling services for UK-based services, regardless of any policy decisions we make on the regulation of GTs. As such, the potential impacts of a ban on GT leasing could be viewed as bringing forward some costs that would anyway be incurred by market participants in the years ahead.<sup>112</sup>
- 4.79 We have also considered whether the ban on GT leasing would have an impact on competition and investment incentives.
- a) We do not consider this to be the case because (i) there are likely to be limited implications for competition in mobile services, given that there are alternative ways of providing mobile services to end users that do not rely on GT leasing; and (ii) we are not aware of any beneficial innovation arising from lessors being able to lease GTs.
  - b) We do not consider that banning GT leasing is likely to have a significant adverse impact on the incentives of operators to innovate and invest in new technologies and services,

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<sup>112</sup> Operators offering services to UK consumers will need to move away from SS7-based services using GTs before mobile operators complete their withdrawal of 3G networks in 2031 at the latest. Although the final withdrawal date for 2G and 3G services in other countries is yet unknown, the number of networks in use is declining steadily and therefore the scope to offer SS7 based services to consumers in those countries is also declining (including UK consumers roaming in those countries).

not least because SS7 signalling, which relies on GTs, is a legacy technology that will eventually be phased out.

## **Impact of banning third parties from creating Global Titles from sub-allocated numbers**

- 4.80 We are proposing to implement a complementary rule that will ban operators from creating and using their sub-allocated numbers as GTs. We consider this could offer further benefits to UK / international citizens as it would reduce the potential harm from the misuse of GTs by bad actors that have not been directly allocated UK mobile numbers. This would also support the UK telecommunications sector by reducing the frequency of security incidents and promote transparency by ensuring that only range holders could create and use GTs (rather than third parties creating GTs from sub-allocated numbers).
- 4.81 We consider that the adverse impact of implementing this proposal is likely to be limited. We are not aware of any operators having created their own GTs from sub-allocated numbers to support their own provision of legitimate mobile services. If there are any such operators, they could potentially apply for their own mobile numbers instead and use these to create GTs. The proposed rule would also prevent any bad actors from attempting to circumvent our ban on GT leasing by attempting to create GTs from sub-allocated number ranges.
- 4.82 We consider that this complementary rule is appropriate and proportionate to address the risk of harm from the misuse of UK GTs. We would, however, welcome input from any operators with sub-allocated numbers (or the relevant number range holders) and other relevant stakeholders that might be impacted by this proposal.

## **Impact of proposed additional measures**

- 4.83 As explained above, we are also proposing to implement the following additional measures to reduce the risk of harms from GT misuse:
- a) Misuse of GTs by range holders. We are proposing to:
    - i) Provide supplementary guidance on the types of steps range holders are expected to take when providing a service to a customer (using a GT as an input) that has the potential to generate malicious signalling.
    - ii) Implement a new Numbering Condition Binding Non-Providers that ensures the current rules in the General Conditions relating to misuse of GTs by number range holders apply to all operators allocated numbers.
  - b) Misuse of GTs created from numbers not allocated for use. We are proposing to:
    - i) Implement a new Numbering Condition Binding Non-Providers that ensures the current rules in the General Conditions relating to unauthorised access apply to all operators allocated numbers.
- 4.84 We expect these measures would further reduce the degree and risk of harm to UK / international citizens. They should also support the effective functioning of the UK telecommunications sector by reducing the frequency of security incidents and make it clear that range holders are accountable for their use of GTs.
- 4.85 We also expect the overall impact of these additional measures on stakeholders to be limited due to the following reasons:

- a) We note that range holders are already subject to rules requiring them to secure the efficient and effective use of numbers which prohibits the misuse of numbers under the General Conditions. This means they should already have processes in place to ensure the services they provide (including those that use GT as an input) do not generate malicious signalling and that their customers are not using a service for an illegitimate purpose. We also note that our proposals do not affect operators' ability to offer legitimate mobile services to their customers. We therefore consider that our proposals would unlikely impose any significant additional burden beyond those already required by the General Conditions.<sup>113</sup>
- b) We do not consider that adding a Numbering Condition Binding Non-Providers corresponding to General Condition B1.3 relating to the misuse of numbers not allocated for use should have any negative impact on stakeholders. As discussed above, this measure only prevents operators from engaging in illegitimate activities whereas we only consider it appropriate to take account of the impact on the ability of stakeholders to provide legitimate services, which should not be affected by this measure.

4.86 Given the discussion above, we consider the proposed additional measures are appropriate and proportionate to address the risk of harm from the misuse of UK GTs. We would welcome inputs from affected stakeholders that might be significantly impacted by these proposals.

## Provisional conclusion

- 4.87 GTs are mobile numbers that are used to facilitate the routing of SS7 signalling messages. GTs play an important facilitating role in the provision of mobile services and they are distinct from regular mobile numbers as they are never assigned to end users. The special status of GTs as signalling addresses creates the potential for misuse in the hands of bad actors.
- 4.88 The practice of GT leasing has allowed bad actors to gain access to the global SS7 signalling network and has resulted in +44 GTs becoming one of the most significant and persistent sources of malicious signalling in the world. Against this background, we have identified evidence that serious harm is arising, and has the potential to arise, from the misuse of UK GTs, which poses a significant threat to both UK and international citizens. Taking into account our duties, we provisionally consider the serious harm associated with the misuse of UK GTs justifies significant intervention to ensure the use of GTs is tightly controlled and that they are only used to support the provision of legitimate services and by operators that are fully accountable for how they are used.
- 4.89 We have taken into account the potential impact of a ban on different stakeholders, as well as the extent and nature of the harms we have identified (in particular the fact that severe and irreparable harm can occur from a single instance of misuse). We provisionally conclude that a ban on GT leasing (with exemptions for intra-group / supplier use), alongside complementary rules to ban creating GTs from sub-allocated numbers, is an appropriate and proportionate solution to meet our objectives and address the risk of harm from the misuse of UK GTs. We also consider that our proposals to strengthen rules regarding the misuse of

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<sup>113</sup> This is in line with our impact assessment for the Good Practice Guide. [Statement: Good practice guide to help prevent misuse of sub-allocated and assigned numbers \(ofcom.org.uk\)](#).

GTs by number range holders and the misuse of GTs from numbers not allocated for use are appropriate and proportionate.

### Implementation period

- 4.90 To help mitigate the impact of our proposals on stakeholders, we consider it appropriate to introduce an implementation period before the ban on GT leasing and the ban on third parties creating GTs from sub-allocated numbers come into force. This should provide the affected stakeholders with sufficient time to prepare and migrate to alternative solutions and dissolve legacy arrangements (if needed).
- 4.91 We therefore provisionally propose to implement the ban on GT leasing and a ban on third parties creating GTs from sub-allocated numbers (that we are proposing to implement via both our General Conditions and corresponding Numbering Conditions Binding Non-Providers) from 1 January 2026. We anticipate this date will be more than nine months after we plan to publish our statement in the first quarter of 2025.
- 4.92 During the implementation period, we recommend that operators that continue to lease their GTs should take account of our Good Practice Guide and the GSMA Code to ensure the risks and harm associated with the misuse of GTs are minimised.
- 4.93 To the extent that our proposed new Numbering Conditions Binding Non-Providers are intended to correspond (as far as possible) with existing obligations in the General Conditions, we are proposing that these conditions are implemented immediately after publication of our statement in the first quarter of 2025.
- 4.94 We are also proposing for our supplementary guidance for range holders to come into effect immediately after publication of our statement in the first quarter of 2025 on the basis that this guidance is intended to help providers comply with their existing obligations in General Conditions B1.6 and B1.8.
- 4.95 We have summarised our proposed implementation periods in Table 5.1 below.

**Consultation question 1:** Do you agree with our proposal to ban GT leasing to third parties? If not, please explain your reasons including how you would prevent malicious signalling by lessees.

**Consultation question 2:** Do you agree with our proposal to only include exemptions to our ban on GT leasing relating to intra-group and supplier use? If you consider that any other exemptions are necessary, please explain how these exemptions could be limited to prevent malicious signalling by lessees.

**Consultation question 3:** Do you agree with our proposal to ban the creation of GTs from sub-allocated numbers by third parties?

**Consultation question 4:** Do you agree with our proposals to strengthen our rules to prohibit the misuse of GTs by operators that hold UK mobile numbers and to provide supplementary guidance on the types of steps range holders are expected to take when providing a service to a customer (using a GT as an input) that has the potential to generate malicious signalling?

**Consultation question 5:** Do you agree with our proposal to strengthen our rules to prohibit the creation of GTs from numbers not allocated for use?

**Consultation question 6:** Do you agree with the proposed implementation period?

**Consultation question 7:** Do you agree with our provisional impact assessment?

# 5. Detailed proposals and legal tests

- 5.1 In this section, we explain in more detail how we intend to implement the proposals we have set out in Section 4. We set out the specific combination of existing and new rules we intend to rely on to address the harms we have identified. In particular, we are proposing to set a new General Condition, modify General Condition B1.2(b), set new conditions binding non-providers and modify the Numbering Plan.
- 5.2 We first set out the various legal tests we need to satisfy and our general approach, including to Numbering Conditions Binding Non-Providers and later explain why we consider any proposed rules or changes satisfy the relevant legal tests. We then identify the different enforcement routes available to us in the event of non-compliance with our proposed rules.

## Legal tests

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### General principles

- 5.3 In proposing to impose the new numbering conditions identified below, we have taken into account our duties and requirements in the Act which we have summarised in Section 2 and set out in more detail in Annex 5. These include:
- a) Our principal duty in section 3(1) of the Act to further the interests of citizens and consumers.
  - b) Our general duty in relation to telephone numbers in section 63(1) of the Act to secure the best use of appropriate numbers and encourage efficiency and innovation for that purpose.
  - c) The requirement in section 3(3)(a) of the Act for all our regulatory activities to be transparent, accountable, proportionate, consistent and targeted only at cases in which action is needed.
  - d) Other matters identified in section 3 of the Act as they appear to us to be relevant in the circumstances.
  - e) The six requirements set out in section 4 of the Act.
  - f) The UK Government's Statement of Strategic Priorities (SSP) for telecommunications, management of radio spectrum and postal services in accordance with section 2B of the Act.
  - g) The desirability of promoting economic growth in section 108 of the Deregulation Act 2015.

### Test for setting or modifying numbering conditions

- 5.4 Section 58 of the Act identifies the type of general conditions Ofcom can impose in relation to the allocation and adoption of numbers. These include:

- a) restrictions on the adoption of telephone numbers by a communications provider, and on other practices by communications providers in relation to telephone numbers allocated to them;<sup>114</sup> and
  - b) requirements on a communications provider in connection with the adoption by him of telephone numbers.<sup>115</sup>
- 5.5 Section 59 of the Act also explains that Ofcom can impose conditions on persons other than communications providers (Numbering Conditions Binding Non-Providers) that relate to:
- a) the allocation of telephone numbers to such persons;
  - b) the transfer of allocations to and from such persons; and
  - c) the use of telephone numbers by such persons.
- 5.6 Section 47(2) of the Act governs the circumstances in which we can set or modify general conditions and Numbering Conditions Binding Non-Providers.<sup>116</sup> It states that a condition can be set or modified where the condition or modification is:
- a) objectively justifiable in relation to the networks, services, facilities, apparatus or directories to which it relates (although this does not apply in relation the setting of a new condition);
  - b) not such as to discriminate unduly against particular persons or against a particular description of persons;
  - c) proportionate to what the condition or modification is intended to achieve; and
  - d) in relation to what it is intended to achieve, transparent.
- 5.7 In accordance with section 48A(3) of the Act, we are also required to publish a notification:
- a) stating that we are proposing to set the relevant numbering conditions;
  - b) setting out the effect of those conditions;
  - c) giving our reasons for making the proposal; and
  - d) specifying the period within which representations may be made to Ofcom about our proposal.
- 5.8 The notifications relating to our proposed modifications to General Condition B1 and Numbering Condition Binding Non-Providers are set out in Annex 6 and 7 respectively.

## Test for modifying the Numbering Plan

- 5.9 Section 56(1) of the Act identifies the types of restrictions that can be included in the Numbering Plan as including:
- a) such restrictions as Ofcom consider appropriate on the adoption of numbers available for allocation in accordance with the plan;<sup>117</sup> and
  - b) such restrictions as they consider appropriate on the other uses to which numbers available for allocation in accordance with the plan may be put.<sup>118</sup>
- 5.10 Section 60 of the Act sets out the legal test that must be met before we can modify the Numbering Plan. It states that the Plan can only be modified where the modification is:

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<sup>114</sup> Section 58(1)(c) of the Act.

<sup>115</sup> Section 58(1)(d) of the Act.

<sup>116</sup> See section 59(4) of the Act in relation to Numbering Conditions Binding Non-Providers.

<sup>117</sup> Section 56(1)(b) of the Act.

<sup>118</sup> Section 56(1)(b) of the Act.

- a) objectively justifiable in relation to the matters to which it relates;
  - b) not such as to discriminate unduly against particular persons or against a particular description of persons;
  - c) proportionate to what the modification is intended to achieve; and
  - d) in relation to what it is intended to achieve, transparent.
- 5.11 In accordance with section 60(3) of the Act, we are also required to publish a notification:
- a) stating that we are proposing to modify the Numbering Plan;
  - b) setting out the effect of our proposed revisions or modifications;
  - c) giving our reasons for making the proposal; and
  - d) specifying the period within which representations may be made to us about our proposal.
- 5.12 The notification in relation to our proposed new restrictions in the Numbering Plan is set out in Annex 8.
- 5.13 The legal framework in Annex 5 sets out our duties and powers and the relevant legal tests in full.

## General approach

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### Reliance on existing rules where appropriate

- 5.14 Taking into account our duties and legal tests, we have first considered whether our existing rules are sufficient to address the harm we have identified or whether we consider further intervention to be justified and proportionate.

### Approach to the Numbering Conditions Binding Non-Providers

- 5.15 Where we are intending to rely on existing or new General Conditions, we are proposing to include, as far as possible, corresponding Numbering Conditions Binding Non-Providers in relation to the use of GTs.
- 5.16 This is because we have identified a risk that the use of GTs in specific scenarios may not always constitute the provision of an electronic communications network or service and therefore persons using GTs might not always be considered a communications provider within the scope of General Condition B1. Further detail is explained in Section 3.
- 5.17 These Numbering Conditions Binding Non-Providers will apply to any persons that are not a Communications Provider (within the scope of General Condition B1) that apply for, or have been allocated numbers, including through sub-allocation under the General Conditions. They should therefore ensure that all operators who might have access to GTs through their number allocations (regardless of whether or not they may be considered a communications provider within the scope of General Condition B1), are subject to our existing and proposed new rules in relation to the misuse of GTs.
- 5.18 To ensure that our proposed Numbering Conditions Binding Non-Providers only apply to the use of telephone numbers as GTs, we are also proposing to insert a new Condition 2.1 which states that: *“This Condition only applies in relation to the use of Telephone Numbers as Global Titles.”*

- 5.19 For the reasons set out above, we provisionally consider our proposed Numbering Conditions Binding Non-Providers to be consistent, objectively justified and proportionate. We consider our proposed conditions go no further than is necessary to address the misuse of GTs.
- 5.20 We also provisionally consider our proposed Numbering Conditions Binding Non-Providers:
- a) Do not discriminate unduly against particular persons or against a particular description of persons. This is because they apply equally to all the persons that have been allocated numbers.
  - b) Are transparent in relation to what they are intended to achieve. We have explained the basis for proposing these conditions above and the wording of the proposed conditions corresponds to the wording of the current or proposed new General Conditions, as far as possible.

## Addressing misuse of Global Titles by third parties

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- 5.21 As explained in Section 4, we have identified misuse of GTs by third parties that access GTs and are planning to address this by banning GT leasing and prohibiting GTs being created from sub-allocated numbers.
- 5.22 To implement this proposal, we are proposing to add a new General Condition B1.5A which will require communications providers to comply with all applicable restrictions relating to GTs as are set out in the Numbering Plan.<sup>119</sup>
- 5.23 We intend to insert a new condition B1.5A rather than rely on the current wording in B1.5(a) due to the risk that that the specific use of a GT in a particular scenario may not be considered the provision of an electronic communications network or service (see Section 3 above).
- 5.24 We propose to insert new restrictions B3.8.1 and B3.8.2 in the Numbering Plan:
- a) Proposed B3.8.1 reads: *“Only those persons to whom Ofcom has Allocated a Telephone Number shall create a Global Title from such a Telephone Number.”*
  - b) Proposed B3.8.2 reads: *“Any person Allocated a Telephone Number shall not authorise the use of that Telephone Number by others for use as a Global Title, except if the person being authorised is: (a) a person in the same group, as defined in section 1261(1) of the Companies Act 2006; or (b) a person supplying services to the person authorising the use, provided that the Telephone Number used as a Global Title is used exclusively to provide that service and for no other purpose.”*
- 5.25 We note that our proposal to insert B3.8.2 will affect the application of the current General Condition B1.2(b), which provides that *“a Communications Provider shall not Adopt Telephone Numbers from Part A of the National Telephone Numbering Plan unless... (b) the Communications Provider has been authorised (either directly or indirectly) to Adopt those Telephone Numbers by the person Allocated those Telephone Numbers.”*
- 5.26 While B1.2(b) will remain applicable to the adoption of numbers in general, it will now be subject to our proposed ban on GT leasing in new General Condition B1.5A. In order to ensure transparency of the scope of our new proposed rules, and impact on the application

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<sup>119</sup> For the full proposed provision, please see the Notification at Annex 8.

of General Condition B1.2(b), we propose to make it clear that General Condition B1.2(b) will be subject to the proposed restrictions in the Numbering Plan relating to GTs. We therefore propose to add “*Subject to General Condition B1.5A*” at the start of General Condition B1.2(b) so that it will read “*a Communications Provider shall not Adopt Telephone Numbers from Part A of the National Telephone Numbering Plan unless... (b) subject to General Condition B1.5A, the Communications Provider has been authorised (either directly or indirectly) to Adopt those Telephone Numbers by the person Allocated those Telephone Numbers.*”

- 5.27 For the reasons set out in Section 4, we consider these proposals to be objectively justified and proportionate. In particular, taking into account our duties, we provisionally consider the serious extent and nature of actual and potential harm to UK citizens associated with the misuse of GTs – including the fact a single instance or misuse can cause severe and irreparable harm – means the potential impact of a ban (and complementary ban on GTs being created from sub-allocated numbers) on different stakeholders, is an appropriate and proportionate solution to meet our objectives. We consider our proposed new condition B1.5A, modified B1.2(b) and restrictions in the Numbering Plan go no further than is necessary to address the misuse of GTs by third parties that access GTs. We have also discussed in Section 4 the various mitigations available including the availability of alternatives and our proposal to allow for an implementation period before our proposals come into effect.
- 5.28 We also provisionally consider the proposed new General Condition B1.5A, modified B1.2(b) and restrictions B3.8.1 and B3.8.2 in the Numbering Plan:
- a) Do not discriminate unduly against particular persons or against a particular description of persons. This is because they apply equally to all the persons that have been allocated numbers.
  - b) Are transparent in relation to what they are intended to achieve. We have explained the basis for proposing these conditions above and consider the proposed wording to be clear. As far as possible, the wording we are proposing follows the format of other General Conditions and restrictions in the Numbering Plan and reuses existing definitions.
- 5.29 For the reasons set out in paragraphs 5.15 to 5.20, we are also proposing to add a new Condition 2.3 to the Numbering Conditions Binding Non-Providers to require persons to comply with all applicable restrictions relating to the GTs as are set out in the Numbering Plan (i.e. the proposed restrictions B3.8.1 and B3.8.2). We explain why we consider this proposed condition meets the relevant legal tests in the same paragraphs above.
- 5.30 Taken together, these proposed restrictions should ensure that only operators allocated numbers, including through sub-allocation under the General Conditions, can create and use GTs.
- 5.31 Our proposed changes to the General Conditions, Numbering Conditions Binding Non-Providers and Numbering Plan are found in the Notifications at Annex 6, 7 and 8 accompanying this consultation.

## Addressing misuse of Global Titles by range holders

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- 5.32 As explained in Section 4, we have identified potential misuse by range holders by malicious signalling that originates directly from number range holders themselves, which may be in connection with the provision of a service to a customer (using a GT as an input).
- 5.33 We consider we can rely on General Conditions B1.6 and/or B1.8 in the event of this type of misuse of GTs by range holders. We do not therefore consider any new rules are required to address this type of misuse by range holders that are communications providers.
- 5.34 For the reasons set out above, we are however proposing to add a new Condition 2.4 to the Numbering Conditions Binding Non-Providers to correspond to General Conditions B1.6 and B1.8. The proposed condition will require persons using telephone numbers to (a) secure that such Telephone Numbers are used effectively and efficiently; and (b) take all reasonably practicable steps to secure that its Customers ensure the effective and efficient use of such Telephone Numbers.
- 5.35 We explain why we consider this proposed condition meets the relevant legal tests in paragraphs 5.15 to 5.20 above. In particular, we note that our proposals do not affect providers' ability to offer legitimate mobile services to their customers. To the extent operators within the scope of this proposed condition are not currently taking appropriate steps to prevent misuse when providing a service to a customer (using a GT as an input) that has the potential to generate malicious signalling, we consider any impact on those operators to be significantly outweighed by the reduction in harm our proposals should result in. We therefore consider our proposed new condition to be justified and proportionate.
- 5.36 As explained in Section 4 above, we are also proposing to issue supplementary guidance on the types of steps operators are expected to take when providing a service to a customer (using a GT as an input) that has the potential to generate malicious signalling.
- 5.37 Our proposed changes to the Numbering Condition Binding Non-Providers are set out in full in the Notification at Annex 7 accompanying this consultation.

## Addressing the creation and misuse of Global Titles from numbers not allocated for use

- 5.38 As explained in Section 4, we have identified malicious signalling that originates from GTs created from numbers that have not been allocated for use.
- 5.39 We consider we can rely on B1.3 in the event of the creation and misuse of GTs by communications providers from numbers not allocated for use. We therefore consider our existing rules are sufficient to address this type of misuse by range holders that are communications providers.
- 5.40 For the reasons set out above, we are however proposing to add a new Condition 2.2 to the Numbering Conditions Binding Non-Providers to correspond to General Condition B1.3 and prohibit the use of telephone numbers not allocated, by operators that may not be considered a communications provider within the scope of General Condition B1. This proposed condition will prohibit persons from using telephone numbers from Part A of the Numbering Plan unless that telephone number has been allocated to a person by Ofcom.

- 5.41 We explain why we consider this proposed condition meets the relevant legal tests in paragraphs 5.15 to 5.20 above.
- 5.42 Our proposed changes to the Numbering Condition Binding Non-Providers are set out in full in the Notification at Annex 7 accompanying this consultation.

## Enforcement to address misuse of Global Titles

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- 5.43 We have a range of powers to take enforcement action for non-compliance with both our existing General Conditions that apply to the use of GTs as well as any new General Conditions we may impose to address the harms from GT misuse. These include:
- a) Powers to impose significant financial penalties of up to 10% of annual turnover.<sup>120</sup>
  - b) Powers to direct providers to take steps in order to comply with the relevant condition and/or remedy the consequences of the contravention. This could, for example, include directing a communications provider to (i) take certain action in relation to a GT including to stop using a specific GT; or (ii) compensate persons that have suffered loss or damage as a result of the non-compliance.<sup>121</sup> It is the duty of the person to comply with any such and that duty is enforceable in civil proceedings by Ofcom.<sup>122</sup>
  - c) Powers to suspend a communications provider’s entitlement to provide electronic communications networks or electronic communications services, or to make associated facilities available.<sup>123</sup>
  - d) Powers to issue a direction under General Condition B4.4 requiring communications providers to block access to certain numbers or communications services on the basis of fraud or misuse.<sup>124</sup>
  - e) Powers to withdraw telephone number allocations if any of the conditions in s. 61(1) of the Act are met including when withdrawal is in accordance with General Condition B1.18(d) or (e).
    - i) B1.18(d) gives us the power to withdraw numbers where “the Communications Provider has used a significant proportion of those Telephone Numbers, or has used such Allocation to a significant extent, inconsistently with ... Condition [B1], or to engage in fraud or misuse”. Depending on the nature and degree of harm that may be caused by GT misuse, we may consider a single instance of misuse to constitute using an “Allocation to a significant extent, inconsistently with ... Condition [B1], or to engage in fraud or misuse”.
    - ii) B1.18(e) gives us the power to withdraw numbers where “Ofcom has advised the Communications Provider in writing that a significant proportion of those Telephone Numbers has been used, or that such Allocation has been used to a significant extent, to cause harm or a nuisance, and the Communications Provider has failed to take adequate steps to prevent such harm or nuisance.”

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<sup>120</sup> See sections 96A – 98 of the Act. We can impose any penalty we consider to be appropriate and proportionate up to the statutory cap and taking into account Ofcom’s [penalty guidelines](#).

<sup>121</sup> Section 96A(2)(d) and section 96C(2)(a) of the Act.

<sup>122</sup> Section 96C(5) and (6).

<sup>123</sup> Section 100 of the Act.

<sup>124</sup> See Annex A11 of our Regulatory Enforcement Guidelines for a summary of the relevant enforcement process.

- 5.44 In the event of non-compliance with our Numbering Conditions Binding Non-Providers, we have powers under section 59(6) of the Act to take enforcement action via civil proceedings against operators allocated numbers (including through sub-allocation under the General Conditions) that may not be considered a communications provider within the scope of General Condition B1. We also have the power to withdraw numbers under section 61(4) of the Act.
- 5.45 Ofcom also has powers under sections 128 to 130 of the Act to take enforcement action against those who persistently misuse electronic communications networks and services including issuing a penalty of up to £2m.<sup>125</sup> This includes providers or other persons. Misuse of electronic communications networks and services involves using a network or service in ways which cause or are likely to cause someone else, including consumers, to suffer harm. Misuse is persistent where it is repeated enough for it to be clear that it represents a pattern of behaviour or practice, or recklessness about whether others suffer the relevant kinds of harm. Any enforcement action for Persistent Misuse would take into account Ofcom's Persistent Misuse statement.<sup>126</sup>
- 5.46 More generally, we may consider it appropriate to maintain a list of providers found in breach of our rules and/or a list of GTs that should not be used on our website. We also intend to discuss with GSMA the possibility of asking it to include our list in its Roaming Gateway if and when we determine that certain GTs should no longer be used.
- 5.47 Ofcom may decide to pursue more than one of these options in the particular circumstances of the case, as permitted by the relevant legislation. When deciding whether to take enforcement action and what enforcement action may be the most appropriate, Ofcom will consider all relevant factors. Where applicable, any enforcement action will generally be carried out in line with Ofcom's Regulatory Enforcement Guidelines.<sup>127</sup>

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<sup>125</sup> See Ofcom's [Persistent misuse statement](#).

<sup>126</sup> [Statement of policy on the persistent misuse of an electronic communications network or electronic communications service](#).

<sup>127</sup> [Regulatory Enforcement Guidelines for investigations](#).

**Table 5.1: Summary of harms and our proposals to address these harms**

Harms identified	Relevant existing regulation and/or guidance	Proposed new regulation and/or guidance, and relevant implementation period
<p><b>1. Misuse by third parties</b></p> <p>A) Malicious signalling that originates from third parties that lease their GTs directly from number range holders or sub-lease GTs from lessees</p>	<p>Not directly addressed by existing regulation or guidance.</p>	<p>Impose General Condition B1.5A; Numbering Conditions Binding Non-Providers 2.1 and 2.3; and restrictions in B3.8.2 of the Numbering Plan.</p> <p>Modify General Condition B1.2(b)</p> <p><b>Implementation period:</b> at least 9 months from statement.</p>
<p>B) Malicious signalling that originates from third parties that create their own GTs from sub-allocated numbers</p>	<p>Not directly addressed by existing regulation or guidance.</p>	<p>Impose General Condition B1.5A; Numbering Conditions Binding Non-Providers 2.1 and 2.3; and restrictions in B3.8.1 of the Numbering Plan.</p> <p><b>Implementation period:</b> at least 9 months from statement.</p>
<p><b>2. Misuse by range holders</b></p> <p>A) Malicious signalling that originates directly from number range holders themselves</p>	<p>General Condition B1.6</p>	<p>Impose Numbering Conditions Binding Non-Providers 2.1 and 2.4</p> <p><b>Implementation period:</b> From statement</p>
<p>B) Malicious signalling that originates from number range holders that have failed to take sufficient steps to prevent misuse when providing a service to a customer (using a GT as an input) that has the potential to generate malicious signalling</p>	<p>General Conditions B1.6 and B1.8</p>	<p>Impose Numbering Conditions Binding Non-Providers 2.1 and 2.4</p> <p>Issue supplemental guidance relating to General Conditions B1.6 and B1.8 setting out the types of steps operators are expected to take when providing a service to a customer (using a GT as an input) that has the potential to generate malicious signalling.</p> <p><b>Implementation period:</b> From statement</p>
<p><b>3. Creation and use of GTs from numbers not authorised for use</b></p>	<p>General Condition B1.3</p>	<p>Impose Numbering Conditions Binding Non-Providers 2.1 and 2.2.</p> <p><b>Implementation period:</b> From statement</p>

Source: Ofcom

## Consultation process and next steps

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- 5.48 We invite comments on the proposals set out in this consultation which closes on **15 October 2024**. We believe that **12 weeks** is sufficient time for stakeholders to fully assess our proposals.
- 5.49 We invite stakeholders to respond to the specific questions asked in this consultation, which are summarised in Annex 4. For stakeholders wishing to respond to this consultation, we request that they consider Annexes 1 to 3 of this document for relevant details.

**Consultation question 8:** Do you agree with our proposed changes to the General Conditions of Entitlement, National Telephone Numbering Plan and Numbering Condition Binding Non-Providers?

# A1 Responding to this consultation

## How to respond

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- A1.1 Ofcom would like to receive views and comments on the issues raised in this document, by **5pm on 15 October 2024**.
- A1.2 You can download a response form from <https://www.ofcom.org.uk/phones-and-broadband/telecoms-infrastructure/consultation-global-titles-and-mobile-network-security>. You can return this by email or post to the address provided in the response form.
- A1.3 If your response is a large file, or has supporting charts, tables or other data, please email it to [globaltitles@ofcom.org.uk](mailto:globaltitles@ofcom.org.uk), as an attachment in Microsoft Word format, together with the cover sheet. This email address is for this consultation only and will not be valid after **15 October 2024**.
- A1.4 Responses may alternatively be posted to the address below, marked with the title of the consultation:
- Networks and Communications Group (Global Titles Team)  
Ofcom  
Riverside House  
2A Southwark Bridge Road  
London SE1 9HA
- A1.5 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.
- A1.6 We will publish a transcript of any audio or video responses we receive (unless your response is confidential)
- A1.7 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.
- A1.8 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.
- A1.9 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.
- A1.10 If you want to discuss the issues and questions raised in this consultation, please contact us by email via [globaltitles@ofcom.org.uk](mailto:globaltitles@ofcom.org.uk).

## Confidentiality

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- A1.11 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.
- A1.12 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 don't have to edit your response.
- A1.13 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.
- A1.14 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.
- A1.15 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

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- A1.16 Following this consultation period, Ofcom plans to publish a statement in the **first quarter of 2025**.
- A1.17 If you wish, you can register to receive mail updates alerting you to new Ofcom publications.

## Ofcom's consultation processes

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- A1.18 Ofcom aims to make responding to a consultation as easy as possible. For more information, please see our consultation principles in Annex 2.
- A1.19 If you have any comments or suggestions on how we manage our consultations, please email us at [consult@ofcom.org.uk](mailto: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.
- A1.20 If you would like to discuss these issues, or Ofcom's consultation processes more generally, please contact the corporation secretary:

Corporation Secretary  
Ofcom  
Riverside House  
2a Southwark Bridge Road  
London SE1 9HA  
Email: [corporationsecretary@ofcom.org.uk](mailto:corporationsecretary@ofcom.org.uk)

# A2 Ofcom's consultation principles

A2.1 Ofcom has seven principles that it follows for every public written consultation:

## Before the consultation

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A2.2 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

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A2.3 We will be clear about whom we are consulting, why, on what questions and for how long.

A2.4 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.

A2.5 We will consult for up to ten weeks, depending on the potential impact of our proposals.

A2.6 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.

A2.7 If we are not able to follow any of these seven principles, we will explain why.

## After the consultation

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A2.8 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.

# A3 Consultation coversheet

## Basic details

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Consultation title:

To (Ofcom contact):

Name of respondent:

Representing (self or organisation/s):

Address (if not received by email):

## Confidentiality

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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:

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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

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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)

# A4 Consultation questions

A4.1 The full list of questions is set out below:

**Consultation question 1:** Do you agree with our proposal to ban GT leasing to third parties? If not, please explain your reasons including how you would prevent malicious signalling by lessees.

**Consultation question 2:** Do you agree with our proposal to only include exemptions to our ban on GT leasing relating to intra-group and supplier use? If you consider that any other exemptions are necessary, please explain how these exemptions could be limited to prevent malicious signalling by lessees.

**Consultation question 3:** Do you agree with our proposal to ban the creation of GTs from sub-allocated numbers by third parties?

**Consultation question 4:** Do you agree with our proposals to strengthen our rules to prohibit the misuse of GTs by operators that hold UK mobile numbers and to provide supplementary guidance on the types of steps range holders are expected to take when providing a service to a customer (using a GT as an input) that has the potential to generate malicious signalling?

**Consultation question 5:** Do you agree with our proposal to strengthen our rules to prohibit the creation of GTs from numbers not allocated for use?

**Consultation question 6:** Do you agree with the proposed implementation period?

**Consultation question 7:** Do you agree with our provisional impact assessment?

**Consultation question 8:** Do you agree with our proposed changes to the General Conditions of Entitlement, National Telephone Numbering Plan and Numbering Condition Binding Non-Providers?

# A5 Legal framework

A5.1 In this Annex, we set out our powers and duties that are relevant to the proposals set out in the accompanying consultation. Our enforcement powers are set out in Section 5 of this consultation.

## Our general duties

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A5.2 The Communications Act 2003 (the Act) places a number of duties on us that we must fulfil when exercising the regulatory powers and functions we have been given.

A5.3 Section 3(1) of the Act states that it shall be our principal duty, in carrying out our functions:

- to further the interests of citizens in relation to communication matters;<sup>128</sup> and
- to further the interests of consumers in relevant markets, where appropriate by promoting competition.<sup>129</sup>

A5.4 In performing our duties under section 3(1) of the Act, we are required to have regard to the principles under which regulatory activities should be transparent, accountable, proportionate, consistent and targeted only at cases in which action is needed, as well as any other principles appearing to us to represent best regulatory practice (section 3(3) of the Act).

A5.5 Section 3(4) of the Act provides that we must have regard, in performing our duties, to a number of matters, as they appear to us to be relevant in the circumstances, including:

- the desirability of promoting competition in relevant markets;
- the desirability of promoting and facilitating the development and use of effective forms of self-regulation (except in relation to our Online Safety functions);
- the desirability of encouraging investment and innovation in relevant markets;
- the desirability of ensuring the security and availability of public electronic communications networks and public electronic communications services;
- the desirability of ensuring that relevant markets facilitate end-to-end connectivity in the interests of consumers in those markets;
- the vulnerability of children and of others whose circumstances appear to us to put them in need of special protection;
- the desirability of preventing crime and disorder;
- the opinions of consumers in relevant markets and of members of the public generally;
- and the extent to which, in the circumstances of the case, the furthering or securing of the matters mentioned in section 3(1) is reasonably practicable.

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<sup>128</sup> “Citizens” means all members of the public in the United Kingdom (section 3(14) of the Act).

<sup>129</sup> “Consumer” is defined in section 405(5) of the Act and includes people acting in their personal capacity or for the purposes of, or in connection with, a business.

- A5.6 In addition, section 3(5) of the Act requires that, when performing our duty to further the interests of consumers, we must have regard, in particular, to the interests of those consumers in respect of choice, price, quality of service and value for money.
- A5.7 Where it appears to us that any of our general duties conflict with each other in a particular case, we must secure that the conflict is resolved in the manner we think is best in the circumstances (section 3(7) of the Act).
- A5.8 Section 4(2) of the Act requires us to act in accordance with six requirements when carrying out certain functions, such as when setting or modifying conditions and the Numbering Plan, which are in summary:
- to promote competition in the provision of electronic communications services, networks and associated facilities and the supply of directories;
  - to promote the interests of all members of the public in the United Kingdom;
  - to take account of the desirability of Ofcom’s carrying out of its functions in a manner which, so far as practicable, does not favour one form of or means of providing electronic communications networks, services or associated facilities over another (i.e. to be technology neutral);
  - to encourage the provision of network access and service interoperability to such extent as Ofcom considers appropriate for the purposes securing efficiency and sustainable competition; efficient investment and innovation; and the maximum benefit for the persons who are customers of communications providers and of persons who make associated facilities available;
  - to encourage compliance with certain standards in order to facilitate service interoperability, end-to-end connectivity, and secure freedom of choice for the customers of telecoms providers; and
  - to promote connectivity and access to very high capacity networks by members of the public and businesses in the United Kingdom.
- A5.9 We consider that the first, second and third of those requirements are of particular relevance to our proposals in this consultation and that no conflict arises in this regard with any of our general duties in section 3 of the Act.
- A5.10 As required by section 2B(2)(a) of the Act, we have also had regard to the UK Government’s Statement of Strategic Priorities for telecommunications, management of radio spectrum and postal services.<sup>130</sup>
- A5.11 Lastly, in accordance with section 108 of the Deregulation Act 2015, we have had regard to the importance of promoting economic growth by exercising our regulatory functions in a way that ensures that regulatory action is taken only when it is needed, and any action taken is proportionate.

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<sup>130</sup> [Statement of Strategic Priorities \(www.gov.uk\)](http://www.gov.uk). We in particular note that in general, the security and resilience of the UK’s telecoms networks is of paramount importance and a strategic priority for the Government.

## Our duties in relation to telephone numbers

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- A5.12 In the carrying out of our functions relating to telephone numbers, it is our duty to:
- a) to secure that what appears to us to be the best use is made of the numbers that are appropriate for use as telephone numbers; and
  - b) to encourage efficiency and innovation for that purpose (section 63(1) of the Act).
- A5.13 It is also our duty, in carrying out our numbering functions, to secure that there is no undue discrimination by communications providers against other communications providers in relation to the adoption of telephone numbers for purposes connected with the use by one communications provider, or his customers, of an electronic communications network or electronic communications service provided by another.

## Our powers in relation to numbering conditions

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### General Conditions

- A5.14 Ofcom's power to set general conditions is set out in section 45(2)(a) of the Act. A general condition may be applied generally to every person providing an electronic communications network ('ECN') or electronic communications service ('ECS'), or to every person providing an ECN or ECS of a particular description specified in the condition (section 46(2) of the Act).
- A5.15 Pursuant to section 45 of the Act, we are authorised to set certain general conditions, including the following:
- a) General conditions making such provisions as we consider appropriate for the purpose of protecting the interests of end-users of public electronic communications services (section 51(1)(a)).
  - b) General conditions in relation to the allocation and adoption of telephone numbers and these include conditions which:
    - i) regulate the use by a communications provider, for the purpose of providing an ECN or ECS, of telephone numbers not allocated to that provider;
    - ii) impose restrictions on the adoption of telephone numbers by a communications provider, and on other practices by communications providers in relation to telephone numbers allocated to them;
    - iii) impose requirements on a communications provider in connection with the adoption by him of telephone numbers;
    - iv) require communications providers to secure compliance with such rules relating to the use of telephone numbers by their customers as we may set out in general conditions or determine in accordance with provision made by the general conditions (Section 58(1)(b)-(d) and (i) of the Act).

### Conditions imposed on non-providers

- A5.16 Pursuant to section 59 of the Act, Ofcom also has the power to impose conditions on persons other than communications providers ('non-providers') in relation to the allocation of telephone numbers to those persons, the transfer of allocations to and from those persons, and the use of telephone numbers by those persons. These conditions are referred to as Numbering Conditions Binding Non-Providers.

A5.17 The conditions that may be set include conditions imposing obligations corresponding to any of the obligations that may be imposed on communications providers by General Conditions. These conditions may make provision for, or be in connection with, the allocation of telephone numbers, the transfer of allocations, or the use of telephone numbers.

A5.18 A person who is not a communications provider, but applies for the allocation of a telephone number, or is allocated such a number, including through sub-allocation under the General Conditions, has a duty to comply with any conditions set under section 59 of the Act.

## Legal tests for setting and modifying numbering conditions

A5.19 Section 47(2) of the Act governs the circumstances in which we can set or modify general conditions and Numbering Conditions Binding Non-Providers. It states that a condition can be set or modified where the condition or modification is:

- a) objectively justifiable in relation to the networks, services, facilities, apparatus or directories to which it relates (although this does not apply in relation to the setting of a new condition);
- b) not such as to discriminate unduly against particular persons or against a particular description of persons;
- c) proportionate to what the condition or modification is intended to achieve; and
- d) in relation to what it is intended to achieve, transparent.

A5.20 We are required under section 48A(3) of the Act to publish a notification:

- a) stating that we are proposing to set the relevant conditions;
- b) setting out the effect of those conditions;
- c) giving our reasons for making the proposal; and
- d) specifying the period within which representations may be made to Ofcom about our proposal.

A5.21 Sections 47 to 49 of the Act apply in relation to the setting of conditions under section 59 relating to non-providers and the modification and revocation of such conditions as they apply in the case of general conditions.<sup>131</sup>

## National Telephone Numbering Plan

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A5.22 Pursuant to its duty under section 56 of the Act, Ofcom has published the National Telephone Numbering Plan (the Numbering Plan)<sup>132</sup> and this sets out, among other things,

- a) such restrictions as Ofcom consider appropriate on the adoption of numbers available for allocation in accordance with the Plan;<sup>133</sup> and
- b) such restrictions as they consider appropriate on the other uses to which numbers available for allocation in accordance with the Plan may be put.<sup>134</sup>

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<sup>131</sup> Section 59(4) of the Act

<sup>132</sup> Available here: <https://www.ofcom.org.uk/siteassets/resources/documents/phones-telecoms-and-internet/information-for-industry/numbering/other/national-numbering-plan.pdf>.

<sup>133</sup> Section 56(1)(b) of the Act.

<sup>134</sup> Section 56(1)(b) of the Act.

## Legal test for modifying the Numbering Plan

A5.23 Section 60 of the Act sets out the legal test that must be met before we can modify the Numbering Plan and explains the procedures for doing so. In particular, section 60(2) provides that Ofcom must not revise or otherwise modify the relevant provisions unless they are satisfied that the revision or modification is:

- a) objectively justifiable in relation to the matters to which it relates;
- b) not such as to discriminate unduly against particular persons or against a particular description of persons;
- c) proportionate to what the modification is intended to achieve; and
- d) in relation to what it is intended to achieve, transparent.

A5.24 Section 60(3) further provides that, to revise or modify the provisions, Ofcom must publish a notification:

- a) stating that they are proposing to do so;
- b) specifying the document that they are proposing to revise or modify;
- c) setting out the effect of their proposed revisions or modifications;
- d) giving their reasons for making the proposal; and
- e) specifying the period within which representations may be made to Ofcom about their proposal.

A5.25 Section 60 also provides that Ofcom may give effect, with or without modifications, to a proposal with respect to which they have published a notification only if—

- they have considered every representation about the proposal that is made to them within the period specified in the notification; and
- they have had regard to every international obligation of the United Kingdom (if any) which has been notified to them for the purposes of this paragraph by the Secretary of State.

# A6 Notification of proposal to set and modify General Conditions under sections 48(1) and 48A(3) of the Act

## Proposal to set and modify General Conditions relating to the Allocation, Adoption and Use of telephone numbers

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### WHEREAS

- A6.1 In accordance with section 48(1) and 48A(3) of the Act, Ofcom proposes to:
- i) insert General Condition B1.5A, as set out in Schedule 1 to this Notification;
  - ii) modify General Condition B1.2(b), as set out in Schedule 1 to this Notification; and
  - iii) add new definitions in the General Conditions, as set out in Schedule 2 to this Notification.
- A6.2 The proposed General Condition B1.5A will have effect by reference to the proposed restrictions we are proposing to insert in the National Telephone Numbering Plan as set out in the Notification at Annex 8 of the consultation accompanying this Notification.
- A6.3 Ofcom's reasons for making the proposal, and the effect of this proposal, are set out in Sections 3 - 5 of the consultation document accompanying this Notification.
- A6.4 Ofcom considers that these proposals comply with the requirements of sections 45 to 49C and 58 of the Act, insofar as they are applicable.
- A6.5 In making these proposals, as explained in Section 5 of the consultation accompanying this Notification, Ofcom has considered and acted in accordance with its general duties under section 3 of the Act, the six requirements set out in section 4 of the Act and its general duty in relation to telephone numbers under section 63 of the Act. We have also had regard to the UK Government's Statement of Strategic Priorities (SSP) for telecommunications, management of radio spectrum and postal services in accordance with section 2B of the Act, as well as the desirability of promoting economic growth in section 108 of the Deregulation Act 2015.
- A6.6 Representations may be made to Ofcom about the proposals set out in this Notification by 15 October 2024 at 5pm.
- A6.7 If implemented, we propose that the obligations set out in Schedule 1 of this Notification shall enter into force at least nine months from the date of Ofcom's Statement following consultation.
- A6.8 A copy of this Notification and the accompanying consultation document have been sent to the Secretary of State in accordance with section 48C(1) of the Act.

A6.9 In this Notification:

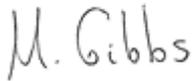
- a) "the Act" means the Communications Act 2003;
- b) "Ofcom" means the Office of Communications.

A6.10 Words or expressions shall have the meaning assigned to them in this Notification, and otherwise any word or expression shall have the same meaning as it has in the Act.

A6.11 For the purposes of interpreting this Notification: (i) headings and titles shall be disregarded; and (ii) the Interpretation Act 1978 shall apply as if this Notification were an Act of Parliament.

A6.12 The Schedules to this Notification shall form part of this Notification.

Signed by

A handwritten signature in blue ink that reads "M. Gibbs".

**Marina Gibbs**

**Policy Director, Networks and Communications**

A person authorised by Ofcom under paragraph 18 of the Schedule to the Office of Communications Act 2002.

**22 July 2024**

## Schedule 1

We propose to insert the following after General Condition B1.5:

General Condition	The regulation we propose to set	The scope of the proposed regulation
<b>B1.5A</b>	The <b>Communications Provider</b> shall comply with all applicable restrictions as are set out in the <b>National Telephone Numbering Plan</b> in relation to the <b>Adoption</b> or use of <b>Telephone Numbers</b> as <b>Global Titles</b> <sup>135</sup>	Imposed on Communications Providers, as defined in the General Conditions

We propose to insert the words “subject to General Condition B1.5A” in General Condition B1.2(b) as set out below:

General Condition	The regulation we propose to modify	The scope of the proposed regulation
<b>B1.2(b)</b>	A Communications Provider shall not Adopt Telephone Numbers from Part A of the National Telephone Numbering Plan unless...  (b) subject to General Condition B1.5A, the <b>Communications Provider</b> has been authorised (either directly or indirectly) to <b>Adopt</b> those <b>Telephone Numbers</b> by the person <b>Allocated</b> those <b>Telephone Numbers</b>	Imposed on Communications Providers, as defined in the General Conditions

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<sup>135</sup> Set out in B3.8 of the National Telephone Numbering Plan.

## Schedule 2

We propose to insert the following definitions in alphabetical order in the 'Definitions' section of the General Conditions:

Term and definition
<p><b>'C7'</b> means to a standard for common channel signalling in Electronic Communications Networks (also known as 'SS7')</p>
<p><b>'Global Title'</b> means a number created from any <b>Telephone Number</b> as may be used and identified for use as a signalling address, for <b>Signalling Connection Control Part of C7</b> in an <b>Electronic Communications Network</b></p>
<p><b>'Signalling Connection Control Part'</b> means the signalling protocol of that name that is part of the SS7 common channel signalling standard as defined in ITU-T Recommendations Q.711 to Q.719</p>

# **A7 Notification of proposal to set Numbering Conditions Binding Non-Providers under sections 48(1) and 48A(3) of the Act**

## **Proposal to set Numbering Conditions Binding Non-Providers relating to the Allocation, Adoption and Use of telephone numbers**

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### **WHEREAS**

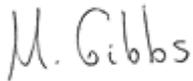
- A7.1 In accordance with sections 48(1) and 48A(3) of the Act, Ofcom proposes to:
- i) set the following Numbering Conditions Binding Non-providers: Conditions: 2.1, 2.2, 2.3 and 2.4, as set out in Schedule 1 to this Notification; and
  - ii) add new definitions in the Numbering Condition Binding Non-Providers,<sup>136</sup> as set out in Schedule 2 to this Notification.
- A7.2 The proposed Condition 2.3 will have effect by reference to the proposed restrictions we are proposing to insert in the National Telephone Numbering Plan as set out in the Notification at Annex 8 of the consultation accompanying this Notification.
- A7.3 Ofcom's reasons for making each of the proposals, and the effect of the proposals, are set out in Sections 3 - 5 of the consultation document accompanying this Notification.
- A7.4 Ofcom considers that these proposals comply with the requirements of sections 45 to 49C and 59 of the Act, insofar as they are applicable.
- A7.5 In making these proposals, as explained in Section 5 of this consultation, Ofcom has considered and acted in accordance with its general duties under section 3 of the Act, the six requirements set out in section 4 of the Act and general duty in relation to telephone numbers under section 63 of the Act. We have also had regard to the UK Government's Statement of Strategic Priorities (SSP) for telecommunications, management of radio spectrum and postal services in accordance with section 2B of the Act, as well as the desirability of promoting economic growth in section 108 of the Deregulation Act 2015.
- A7.6 Representations may be made to Ofcom about the proposals set out in this Notification by 15 October 2024 at 5pm.

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<sup>136</sup> [Numbering Condition Binding Non-Providers: Unofficial Consolidated Version \(ofcom.org.uk\)](https://www.ofcom.gov.uk/consult/condocs/numbering/numbering-condition-binding-non-providers-unofficial-consolidated-version).

- A7.7 If implemented, we propose that the obligations set out in Schedule 1 shall enter into force at least nine months from the date of Ofcom's Statement following consultation.
- A7.8 A copy of this Notification and the accompanying consultation document have been sent to the Secretary of State in accordance with section 48C(1) of the Act.
- A7.9 In this Notification:
- a) "the Act" means the Communications Act 2003;
  - b) "Ofcom" means the Office of Communications.
- A7.10 Words or expressions shall have the meaning assigned to them in this Notification, and otherwise any word or expression shall have the same meaning as it has in the Act.
- A7.11 For the purposes of interpreting this Notification: (i) headings and titles shall be disregarded; and (ii) the Interpretation Act 1978 shall apply as if this Notification were an Act of Parliament.
- A7.12 The Schedules to this Notification shall form part of this Notification.

Signed by



**Marina Gibbs**

**Policy Director, Networks and Communications**

A person authorised by Ofcom under paragraph 18 of the Schedule to the Office of Communications Act 2002.

**22 July 2024**

## Schedule 1

We propose to insert the following in the Numbering Condition Binding Non-Providers after Condition 1:

	<b>Condition 2: Requirements in connection with the use of telephone numbers as Global Titles</b>	<b>The scope of the proposed regulation</b>
Condition 2.1	This Condition only applies in relation to the use of Telephone Numbers as Global Titles	Imposed on any person that is not a Communications Provider (as defined in the General Conditions) that applies for, or has been allocated numbers, including through sub-allocation under the General Conditions, in relation to that person's use of Telephone Numbers as GTs
Condition 2.2	A person may only use a Telephone Number from Part A of the National Telephone Numbering Plan where that Telephone Number has been Allocated to a person, unless the use in question is for the purposes of indicating that the Telephone Number has not been Allocated	
Condition 2.3	Any person using a Telephone Number shall comply with all applicable restrictions as are set out in the National Telephone Numbering Plan	
Condition 2.4	Where Telephone Numbers are being used by any person, that person shall: (a) secure that such Telephone Numbers are used effectively and efficiently; and (b) take all reasonably practicable steps to secure that its Customers ensure the effective and efficient use of such Telephone Numbers	

## Schedule 2

We propose to insert the following definitions in alphabetical order in the 'Part 1: Definitions and Interpretation' section of the "Numbering Condition Binding Non-Providers":

Term and definition
<b>'Allocated'</b> , in relation to a <b>Telephone Number</b> , means allocation by <b>Ofcom</b>
<b>'Telephone Number'</b> means, subject to any order of the Secretary of State pursuant to section 56(7) of the <b>Act</b> , any number, including data of any description, that is used (whether or not in connection with telephony) for any one or more of the purposes listed in section 56(5) of the <b>Act</b>
<b>'C7'</b> means to a standard for common channel signalling in Electronic Communications Networks (also known as 'SS7')
<b>'Global Title'</b> means a number created from any <b>Telephone Number</b> as may be used and identified for use as a signalling address, for <b>Signalling Connection Control Part</b> of <b>C7</b> in an <b>Electronic Communications Network</b>
<b>'Signalling Connection Control Part'</b> means the signalling protocol of that name that is part of the SS7 common channel signalling standard as defined in ITU-T Recommendations Q.711 to Q.719

# A8 Notification of proposal to modify the Numbering Plan under section 60(3) of the Act

## Proposal to modify the restrictions in the Numbering Plan

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### WHEREAS

- A8.1 In accordance with sections 60 of the Act, Ofcom proposes to modify the Numbering Plan to:
- i) Insert new restrictions: B3.8.1 and B3.8.2 as set out in Schedule 1 of this Notification; and
  - ii) Insert new definitions as set out in Schedule 2 of this Notification.
- A8.2 The proposed numbering conditions (specifically General Condition B1.5A and Condition 2.3 of the Numbering Conditions Binding Non-Providers) in the Notifications in Annex 6 and Annex 7, will have effect by reference to the provisions referenced in paragraph 1(i) of this Notification.
- A8.3 Ofcom's reasons for making the proposals, and the effect of the proposals, are set out in Sections 3 - 5 of the consultation document accompanying this Notification.
- A8.4 Ofcom considers that the proposed modification complies with the requirements in section 60(2) of the Act.
- A8.5 In making these proposals, as explained in section 5 of the consultation accompanying this Notification, Ofcom has considered and acted in accordance with its general duties under section 3 of the Act, the six requirements set out in section 4 of the Act and its general duty in relation to telephone numbers under section 63 of the Act. We have also had regard to the UK Government's Statement of Strategic Priorities (SSP) for telecommunications, management of radio spectrum and postal services in accordance with section 2B of the Act, as well as the desirability of promoting economic growth in section 108 of the Deregulation Act 2015.
- A8.6 Representations may be made to Ofcom about the proposals set out in this Notification by 15 October 2024 at 5pm.
- A8.7 If implemented, the proposed modifications set out in the Schedules shall enter into force at least nine months from the date of Ofcom's Statement following consultation.
- A8.8 In this Notification:
- a) "the Act" means the Communications Act 2003;
  - b) "Ofcom" means the Office of Communications.

c) 'Numbering Plan' means the National Telephone Numbering Plan published by Ofcom from time to time.

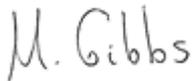
d) Annex 6 and 7 means the relevant annexes to the consultation accompanying this Notification.

A8.9 Words or expressions shall have the meaning assigned to them in this Notification, and otherwise any word or expression shall have the same meaning as it has in the Act.

A8.10 For the purposes of interpreting this Notification: (i) headings and titles shall be disregarded; and (ii) the Interpretation Act 1978 shall apply as if this Notification were an Act of Parliament.

A8.11 The Schedule to this Notification shall form part of this Notification.

Signed by

A handwritten signature in black ink that reads "M. Gibbs". The signature is written in a cursive, slightly slanted style.

**Marina Gibbs**

**Policy Director, Networks and Communications**

A person authorised by Ofcom under paragraph 18 of the Schedule to the Office of Communications Act 2002.

**22 July 2024**

## Schedule 1

We propose to insert the following restrictions in Part B of Numbering Plan after B3.7

	B3.8 Global Titles	The scope of the proposed regulation
B3.8.1	Only those persons to whom Ofcom has <b>Allocated a Telephone Number</b> shall create a Global Title from such a <b>Telephone Number</b> .	
B3.8.2	Any person <b>Allocated a Telephone Number</b> shall not authorise the use of that <b>Telephone Number</b> by others for use as a <b>Global Title</b> , except if the person being authorised is: <ul style="list-style-type: none"> <li>a) a person in the same group, as defined in section 1261(1) of the Companies Act 2006, or</li> <li>b) a person supplying services to the person authorising the use, provided that the Telephone Number used as a Global Title is used exclusively to provide that service and for no other purpose.</li> </ul>	

## Schedule 2

The following text shall be inserted in alphabetical order in the 'Definitions and interpretation' section of the Numbering Plan.

### Term and definition

**'Global Title'** means a number created from any **Telephone Number** as may be used and identified for use as a signalling address, for **Signalling Connection Control Part of C7** in an **Electronic Communications Network**

**'Signalling Connection Control Part'** means the signalling protocol of that name that is part of the SS7 common channel signalling standard as defined in ITU-T Recommendations Q.711 to Q.719

# A9 Analysis of responses to the Lessor Information Request

A9.1 In this Annex we provide a summary of our analysis of responses to the Lessor Information Request, covering:

- the incidence of GT Leasing using UK mobile numbers: and
- the control measures applied by lessors.

## Global Title leasing using UK mobile numbers

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A9.2 In January 2023, we sent an information request to all operators to whom Ofcom and its predecessors have allocated +44 mobile numbers (including those in the Crown Dependencies), requesting information about their use of mobile numbers and GTs (the January 2023 Information Request). We asked each whether they had formed GTs from their allocation of mobile numbers and whether they leased or otherwise allowed one or more of their GTs to be used by any other company.<sup>137</sup>

A9.3 37 of the 77 respondents to the January 2023 Information Request stated that they had formed GTs from their allocations of mobile numbers. Of these, seven operators confirmed they leased or otherwise allowed one or more of their GTs to be used by another company.<sup>138</sup> This includes operators that offer services in the UK and operators that offer services in the Crown Dependencies.

A9.4 In January 2024 we sent a further information request (the Lessor Information Request) to these seven operators, seeking information about their lessees and the controls to address the risk of malicious signalling (amongst other things).<sup>139</sup> The responses, summarised in Table A9.1 below, indicated that they have leased GTs to 80 third parties comprising 71 different companies (as seven leased GTs from more than one operator). 78 of these lessees were third parties and two were suppliers who used the GTs solely to support the provision of services to the lessor.<sup>140</sup> The number of third-party lessees per lessor ranged from 1 - 22. 74 of the third-party lessees (94%) were customers of the four largest lessors.

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<sup>137</sup> Mobile Audit 2022 and Global Titles Review: Final Notice Requiring the Provision of Information Under Section 135 of the Communications Act 2003, 25 January 2023. Sent to all 85 communications providers holding mobile numbers allocated by Ofcom excluding those known or thought to have ceased trading. We received 77 responses with remaining communications providers being either dissolved, returning their ranges, or being unable to contact.

<sup>138</sup> Excluding companies within their corporate group.

<sup>139</sup> These questions were aimed at improving our understanding on areas such as (i) use cases for GT leasing; (ii) information on GT leasing by the lessor; (iii) the lessor's existing measures to reduce misuse; and (iv) application of the GSMA Code.

<sup>140</sup> Excluding companies within their corporate group and communications providers providing services to them.

**Table A9.1: Global Title leasing by operators allocated mobile numbers by Ofcom and its predecessors**

Operator	Number of third party lessees	Number of supplier lessees
[redacted]	15-25 [redacted]	0-2 [redacted]
[redacted]	15-25 [redacted]	0-2 [redacted]
[redacted]	15-25 [redacted]	0-2 [redacted]
[redacted]	15-25 [redacted]	0-2 [redacted]
[redacted]	1-5 [redacted]	0-2 [redacted]
[redacted]	1-5 [redacted]	0-2 [redacted]
[redacted]	1-5 [redacted]	0-2 [redacted]
<b>Total</b>	<b>78</b>	<b>2</b>

Source: Ofcom analysis of responses to the Lessor Information Request<sup>141</sup>

- A9.5 We also required the seven operators to provide us with details of the stated use case (i.e. the application or service) being provided by the lessees using the GTs.
- A9.6 As shown in Table A9.2 below, these included a range of mobile services (such as MVNO and outbound roaming) and services that utilise information held by mobile operators (such as number authentication). We have provided an overview of these service types in Section 2.

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<sup>141</sup> [redacted] response dated 16 February 2024, [redacted] response dated 13 February 2024, [redacted] response dated 16 February 2024, [redacted] response dated 27 February 2024, [redacted] response dated 13 February 2024, [redacted] response dated 13 February 2024 and [redacted] response dated 16 February 2024 to the Lessor Information Request.

**Table A9.2: Summary of use cases for Global Titles leased to third parties**

Lessees' use-case	Number of third-party lessees
Outbound Roaming Solution	22
Application to Person SMS (A2P SMS)	22
Authentication Services	18
Mobile virtual network operator (MVNO) (including outbound roaming solution and network extension)	8
Penetration Testing	4
Communications Provider as a Service (CPaaS)	2
Least-cost Routing/Number Authentication	1
Not specified	1
<b>Total</b>	<b>78</b>

Source: Ofcom analysis of responses to the Lessor Information Request<sup>142</sup>

A9.7 Although these use-cases are ostensibly legitimate services, the Enea Report outlined above associated some of the GTs used by these lessees with malicious signalling. This suggests some lessees may not be using their leased GTs for the stated purposes or may also be using them for malicious signalling or are allowing others to use them for malicious signalling (e.g. by sub-leasing).<sup>143</sup>

## Control measures applied by Global Title lessors

A9.8 Most lessors have some form of policy on misuse of GTs and risk management of GTs as summarised in Table A9.3 below.

<sup>142</sup> [redacted] responses dated 16 February 2024 and 3 May 2024, [redacted] responses dated 13 February 2024 and 3 May 2024, [redacted] responses dated 16 February 2024 and 3 May 2024, [redacted] responses dated 27 February 2024 and 2 May 2024, [redacted] responses dated 13 February 2024 and 1 May 2024, [redacted] responses dated 13 February 2024 and 3 May 2024 and [redacted] response dated 16 February 2024 to the Lessor Information Request.

<sup>143</sup> We also have insufficient information to determine whether the stated use cases are consistent with applicable data protection and privacy requirements.

**Table A9.3: Summary of lessors’ policies on misuse and risk management**

Lessor	Due diligence checks undertaken before contracting to provide leased GTs	Initial risk assessment of potential lessees	Ongoing/ periodic risk assessment of lessees	Processes to revoke/ suspend leased GTs in connection with misuse
[redacted]	Yes	Yes	Yes	Yes
[redacted]	Yes	Yes	Yes	Yes
[redacted]	No	No	No	No
[redacted]	Yes	Yes	No	Yes
[redacted]	Yes	Yes	Yes	No
[redacted] <sup>144</sup>	N/A	N/A	Yes	Yes
[redacted]	Yes	Yes	Yes	Yes
<b>Summary</b>	<b>5/6</b>	<b>5/6</b>	<b>5/7</b>	<b>5/7</b>

Source: Ofcom analysis of responses to the Lessor Information Request and the January 2023 Information Request<sup>145</sup>

**A9.9** There are significant differences between lessors’ policies and procedures:

- One lessor [redacted] said that it did not have established due diligence and risk assessment processes because it had a single MVNO lessee and did not intend to offer leased GTs to others.<sup>146</sup>
- Although five lessors carried out due-diligence and risk-assessment before leasing a GT, the nature of these processes varied significantly. While some make comprehensive enquiries about prospective lessees (typically spanning company checks, directors’ identities and proposed use-cases), others appear to make more limited enquiries. One lessor [redacted], the second largest lessor by volume of lessees, said that most of its business was from referrals from trusted third parties and that it only undertook credit-checks and made enquiries about the proposed use case. It did however have an initial trial phase during which it monitored each lessee’s compliance with the stated use-case.<sup>147</sup>
- Four lessors said they conducted ongoing or periodic risk assessment of lessees after leasing GTs. However, one lessor [redacted], the second largest lessor by volume of lessees,

<sup>144</sup> Summary has partial information for one lessor [redacted] which was not asked to provide full information on these topics.

<sup>145</sup> [redacted] responses dated 16 February 2024 and 3 May 2024, [redacted] responses dated 13 February 2024 and 3 May 2024, [redacted] responses dated 16 February 2024 and 3 May 2024, [redacted] responses dated 27 February 2024 and 2 May 2024, [redacted] responses dated 13 February 2024 and 1 May 2024, [redacted] responses dated 13 February 2024 and 3 May 2024 and [redacted] response dated 16 February 2024 to the Lessor Information Request.

<sup>146</sup> [redacted] response dated 16 February 2024 to question 15(a) of the Lessor Information Request.

<sup>147</sup> [redacted] response dated 21 February 2024 to question 15(a) of the Lessor Information Request.

did not have such processes. It considered that its random checks of lessees' traffic for compliance had proved adequate.

## Lessors' technical controls

A9.10 All seven lessors apply some form of technical measures to their leased GTs as summarised in Table A9.4 below.

**Table A9.4: Summary of technical measures applied by Global Title lessors to third party lessees**

Lessor	Lessor routing	Traffic routing from lessee to lessor network	Real-time technical controls limiting signaling to message types required for lessee's use case	Monitoring of lessees' signaling traffic	Retention of signaling data
[redacted]	Yes	Private link	Implementing	Yes	No
[redacted]	Yes	Transit	Yes	Yes	No
[redacted]	Yes	Private link	Yes	Yes	No
[redacted]	Yes	Private link	No	No	No
[redacted]	Yes	Private link	Yes	Yes	Yes
[redacted]	Yes	Private link	Yes	Yes	No
[redacted]	Yes	Private link and transit	Yes	Yes	Yes
<b>Summary</b>	<b>7/7</b>		<b>5/7</b>	<b>6/7</b>	<b>2/7</b>

Source: Ofcom analysis of responses to the Lessor Information Request<sup>148</sup>

A9.11 The responses indicated there are significant differences between lessors' technical measures:

- One lessor [redacted] said that it did not apply any technical measures, other than a requirement to route traffic to its network over a private link, because it had a single MVNO lessee and didn't intend to offer leased GTs to others.<sup>149</sup>
- Private point to point links provide the greatest assurance that signalling traffic is all routed via the lessor. Although five lessors use this method exclusively, two use transit networks to some extent. This latter method gives greater scope for bad actor lessees to bypass the lessor and to route malicious signalling directly to target networks.

<sup>148</sup> [redacted] responses dated 16 February 2024 and 3 May 2024, [redacted] responses dated 13 February 2024 and 3 May 2024, [redacted] responses dated 16 February 2024 and 3 May 2024, [redacted] responses dated 27 February 2024 and 2 May 2024, [redacted] responses dated 13 February 2024 and 1 May 2024, [redacted] responses dated 13 February 2024 and 3 May 2024 and [redacted] response dated 16 February 2024 to the Lessor Information Request.

<sup>149</sup> [redacted] response dated 16 February 2024 to the Lessor Information Request.

- Five lessors applied real-time controls designed to limit the signalling messages that lessees can transmit to types relating to their stated use case (e.g. SMS related signalling messages for an SMS application) and one lessor said it was in the process of implementing such controls.
- Six lessors proactively monitor lessees’ signalling traffic to some extent. One of these lessors [X] appeared to have sophisticated signalling monitoring tools. However, some others provided little evidence that lessees’ signalling traffic is closely monitored and most do not retain signalling data for retrospective analysis.<sup>150</sup>

## Incidence of sub-leasing of GTs

A9.12 We also asked lessors whether any of their leased GTs were sub-leased. Five lessors indicated that none of their GTs were sub-leased. One lessor [X] stated that some of its GTs were subleased because it had [X] that leases some of its GTs and that as a result, those GTs were now sub-leased by [X] to its customers. This lessor noted that its contract requires [X] to undertake due diligence measures and to route all traffic via the lessor’s network for active policing and control.<sup>151</sup>

## Lessors’ implementation of the GSMA Code

A9.13 In the Lessor Information Request, we asked six lessors whether they had implemented any parts of the GSMA Code. Lessors’ responses summarised in Table A9.5 below indicated that none had fully implemented the Code.

**Table A9.5: Lessors’ stated implementation of the GSMA GT Leasing Code of Conduct**

Operator	Stated implementation of the GSMA Code
[X]	Compliant with parts of the Code
[X]	Not implemented
[X]	Implementing
[X]	Not implemented
[X]	Not implemented
[X]	Compliant with parts of the Code

Source: Ofcom analysis of responses to the Lessor Information Request<sup>152</sup>

A9.14 As previously noted, the GSMA Code requires lessors who are full members of the GSMA to include information in their IR.21 submissions to the GSMA Roaming Database listing leased

<sup>150</sup> [X] responses dated 16 February 2024 and 3 May 2024, [X] responses dated 13 February 2024 and 3 May 2024, [X] responses dated 16 February 2024 and 3 May 2024, [X] responses dated 27 February 2024 and 2 May 2024, [X] responses dated 13 February 2024 and 1 May 2024, [X] responses dated 13 February 2024 and 3 May 2024 and [X] response dated 16 February 2024 to the Lessor Information Request.

<sup>151</sup> [X] response dated 13 February 2024 to the Lessor Information Request.

<sup>152</sup> [X] response dated 16 February 2024, [X] response dated 13 February 2024, [X] response dated 16 February 2024, [X] response dated 27 February 2024, [X] response dated 13 February 2024 and [X] response dated 16 February 2024 to the Lessor Information Request.

GTs and lessees' contact details. Only one lessor stated that it was compliant with this requirement in its response to the Lessor Information Request.<sup>153</sup>

The overview section in this document is a simplified high-level summary only. The proposals we are consulting on and our reasoning are set out in the full document.

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<sup>153</sup> [X] response dated 16 February 2024, [X] response dated 13 February 2024, [X] response dated 16 February 2024, [X] response dated 27 February 2024, [X] response dated 13 February 2024, [X] response dated 13 February 2024 and [X] response dated 16 February 2024 to the Lessor Information Request.