Three's response to Ofcom's Net Neutrality Review Consultation

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Executive Summary.

Three UK welcomes the opportunity to respond to Ofcom's Net Neutrality Consultation. Net Neutrality policy will be a key determinant of how telecoms networks, services and, subsequently, consumer outcomes evolve in the future, and we are pleased to see Ofcom engaging in the detail of it.

Net Neutrality (or the 'Open Internet') is the principle that internet users (consumers and Content and Application Providers, or CAPs) should control what they see or do online. Net Neutrality legislation in the UK today has effectively been transposed from the 2016 EU Open Internet regulations, which require that all traffic is treated equally under a 'best efforts' model (with a few exceptions) and applies demanding restrictions on the services that ISPs can offer their customers.

Growth in traffic, demand for quality differentiation and the prospect of new specialised services with 5G is putting the UK's Net Neutrality framework under increasing pressure.

The key question facing UK policymakers today is how to protect the Open Internet while also supporting innovation by ISPs and investment in connectivity that delivers the infrastructure that the UK needs. They must do this in a world where the Net Neutrality debate has become polarised, with ISPs arguing for more permissive regulation while CAPs want a strict interpretation of the rules.

Following Brexit, the UK is now free to chart its own course on Net Neutrality, subject to a few constraints. This presents an opportunity for policymakers to reconsider the framework protecting the Open Internet in the UK.

In our response, we set out why Ofcom should recommend that the UK repeals Net Neutrality laws and returns to the model that preceded the adoption of the EU's Open Internet regulations in 2016, and which is working well in other countries (e.g., the US). Retail competition, basic transparency rules and competition law can be expected to protect the Open Internet without the need for heavy-handed regulation.

From the perspective of an MNO, the Net Neutrality framework is not sufficiently flexible and has created too much uncertainty to provide a sustainable template for the future. Instead of banning practices upfront (or requiring 'innovation by permission'), ISPs should be allowed to launch new services, with competition regulators acting if and when ISPs abuse that freedom in an anti-competitive way.

We recognise that this is a fundamental change requiring new legislation. In the interim, Ofcom's guidance should be both permissive and clear. Our response is structured as follows:

- In Section 1, we give an overview of the history of Net Neutrality regulation, the different possible models to regulate the internet, and our view that the UK would be best served by a repeal of Net Neutrality laws and a return to light-touch regulation.

- In Section 2, we set out our understanding of traffic management rules in the UK and how Ofcom has enforced them. We find that the UK follows a 'best efforts' model in practice, which has created excessive congestion in mobile networks and restricted competition on quality. We agree with the legislative changes identified by Ofcom that would allow MNOs to offer retail packages with different quality levels for specific content and applications, and target traffic management at those.

- In Section 3, we describe how restrictions on ISPs having the option to charge CAPs for carrying or prioritising their traffic harm consumers. We also explain that CAPs do not fully consider their impact on ISP's networks when delivering content, resulting in wasted network investment, higher retail broadband prices and congested networks. We propose regulation that would place an obligation on certain CAPs to negotiate a fair and reasonable price for the delivery of traffic with ISPs (with arbitration as a fallback).

- In Section 4, we explain how the ambiguity of zero-rating and specialised services rules disincentivises ISPs from creating zero-rating propositions that consumers want or developing new specialised services. Absent legislative change, Ofcom's guidance should treat all zero-rating propositions the same, only intervening in isolated cases where there is a genuine competition concern and provide much more clarity on when a service will be treated as 'specialised'.

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Executive summary

This section briefly discusses the rationale and objectives of Net Neutrality regulation. Subject to a few constraints in the UK's trade agreement with the EU, the UK is now free to chart its own course on Net Neutrality. Ofcom can recommend legislative changes where needed.

We discuss three possible models of internet regulation for the UK: the strict best-efforts model, the current Net Neutrality framework (modified to give greater flexibility to ISPs as proposed by Ofcom), and a US-style repeal of Net Neutrality rules.

Three believes that Ofcom should recommend a repeal of Net Neutrality legislation to Government, and a return to the light-touch model of self-regulation and ex-post competition law that existed in the UK (and which has now been adopted in the US).

From the perspective of an MNO, the current model of ex-ante regulation is not sufficiently flexible and creates too much uncertainty to provide a sustainable template for future regulation of the internet. ISPs should be free to develop and market new services, with competition authorities acting ex-post if they abuse that freedom in an anti-competitive way.

Rationale and objectives of Net Neutrality regulation

Net Neutrality, also known as the 'Open Internet', is the principle that users of the internet (including consumers and Content and Application Providers, or CAPs) should control what they see and do online – not the internet service provider (ISP) that connects them to the internet.

Origin of the Open Internet idea

The US was the birthplace of the Open Internet idea. In 2010 the US Federal Communications Commission's (FCC) adopted rules to regulate internet access for the first time.

The FCC's 2010 Open Internet Order imposed a transparency obligation requiring ISPs to disclose network management practices; and prohibited ISPs from blocking or discriminating against lawful internet traffic, services, or devices (subject to reasonable network management).[1]

[1] The first two rules applied to both fixed and mobile ISPs, the third rule only to fixed ISPs due to greater competition and higher operational constraints in the mobile market.

In 2015, the FCC issued a second Open Internet Order with three bright-line rules prohibiting ISPs from i) blocking lawful content, applications, services, or non-harmful devices; ii) throttling lawful internet traffic based on content, applications, services, or non-harmful devices; and iii) engaging in 'paid prioritisation' (i.e. creating a tiered internet with fast and slow lanes by favouring some traffic in exchange for payment).

The FCC's 2015 Open Internet Order also established a more flexible standard (known as the 'General Conduct Rule') which prohibited ISPs from unreasonably interfering or disadvantaging users from accessing the content or services of their choice.

The rationale for the Open Internet

Three different rationales have been advanced in defence of the Open Internet notion.

First, the FCC sought to promote a "*virtuous circle of innovation*", where innovation by CAPs – i.e. new content, applications, and services – leads to increased consumer demand for broadband, which in turn drives greater investment in ISP networks and further innovation by CAPs.

This virtuous circle has been said to enable 'innovation without permission'.[2] By lowering entry barriers, any CAP (large or small) can create a website and test, develop, and distribute new services and applications to a large addressable market through a global network. At the same time, consumers enjoy near-instant access to content and services of their choice (such as music, films or books).

In addition, the Open Internet was seen to facilitate individual rights and democracy, as it provides a platform for free speech, enabling citizens to participate in public debate and access a diversity of political views and opinions, in addition to other cultural and public services over the internet.

Third, it was thought that the Open Internet was needed to avoid the creation of a two-tier internet, where premium connectivity for the few left little internet capacity for the many. The FCC was concerned that, absent appropriate rules, ISPs would have incentives to disrupt the virtuous circle of innovation in three main ways:

- First, ISPs may block or otherwise disadvantage specific CAPs (or classes of CAP) to benefit their own services at the expense of rival offerings;

[2] statement.pdf (ofcom.org.uk)

- Second, ISPs may have incentives to increase revenues by charging CAPs excessive fees for access (or prioritised access) to the ISP's end users – an ISP acts as a gatekeeper to its subscribers, as it provides a unique route for CAPs to reach those customers over the subscription period; and

- Third, if allowed to charge CAPs, ISPs may be incentivised to degrade (or refuse to improve) the quality of service they provide to non-prioritised traffic – confronting CAPs with a choice between accepting low-quality transmission or paying fees for prioritised access to end users.

Transparency requirements about ISPs' network management practices were also justified on the basis that, absent Open Internet rules, end users would be less able to make informed choices, giving ISPs a greater incentive to violate open Internet principles.

In the FCC's view, these concerns did not depend upon ISPs having market power in the retail mobile market (although the incentive to behave anti-competitively would be greater if consumers find it difficult to switch to rival ISPs).[3] Instead, the FCC believed that an ISP's ability to block or otherwise disadvantage CAPs depends on end users not being fully responsive to the imposition of such restrictions.

Implementation of Net Neutrality in the UK

The UK was one the first countries in Europe to embrace self-regulation of the internet, years before implementation of the EU rules in 2016. In its 2011 Statement on Net Neutrality Ofcom decided to rely primarily on effective competition amongst ISPs to protect the Open Internet.[4]

Ofcom concluded that market forces could be relied upon to address issues of blocking and discrimination, setting out its views about transparency requirements needed to enable consumers to make informed decisions (i.e. information on traffic management practices and which services were blocked or discriminated against).

The main ISPs and MNOs signed the voluntary Open Internet Code of Practice in 2012, committing not to block services, provide greater

[3] An ISP's incentive to favour affiliated content (or the content of unaffiliated firms that pay for it to do so), its incentive to block or degrade traffic or charge CAPs for access to end users, and its incentive to squeeze non-prioritized transmission will be greater if end users are less able to respond by switching to rival ISPs.
[4] statement.pdf (ofcom.org.uk)

transparency and not to use unreasonable traffic management practices to degrade the services of a competitor.[5]

Since 2016 Net Neutrality rules in Europe and the UK have followed the FCC's 2015 Open Internet Order, which has provided the template for all subsequent legislation in other countries.

The EU's 2016 Open Internet Regulation also aims to protect the Open Internet and it has now been incorporated in domestic UK law. Ofcom's consultation sets out the same rationale originally developed in the FCC orders.

This includes the need to constrain the gatekeeper position that ISPs hold over CAPs and the limited incentives of ISPs to be transparent with consumers about how they manage their networks.[6] Ofcom has added a third rationale – i.e. reducing barriers which prevent smaller CAPs from accessing the widest possible market.

As Ofcom has noted, this is achieved by imposing 'must-carry' and 'non-discrimination' obligations on ISPs, which prohibit them from blocking, throttling, or applying differential treatment of traffic for commercial reasons (which, in practice, prevents ISPs from charging CAPs for such access).[7]

Three models of internet regulation for the UK: the best-efforts Open Internet, Net Neutrality rules, and ex-post competition law

We welcome Ofcom's consultation on how Net Neutrality rules in the UK should apply. Subject to a few constraints in the UK's trade agreement with the EU,[8] the UK is now free to chart its own course on Net Neutrality. Government (and ultimately Parliament) are responsible for the rules, but Ofcom can recommend legislative changes where needed.

Today, the Net Neutrality debate has become polarised, with ISPs arguing for more permissive regulation while CAPs want strict Net Neutrality principles to be enforced. Beyond a consensus that ISPs should not act as gatekeepers to the internet, strong disagreement remains in two key areas:

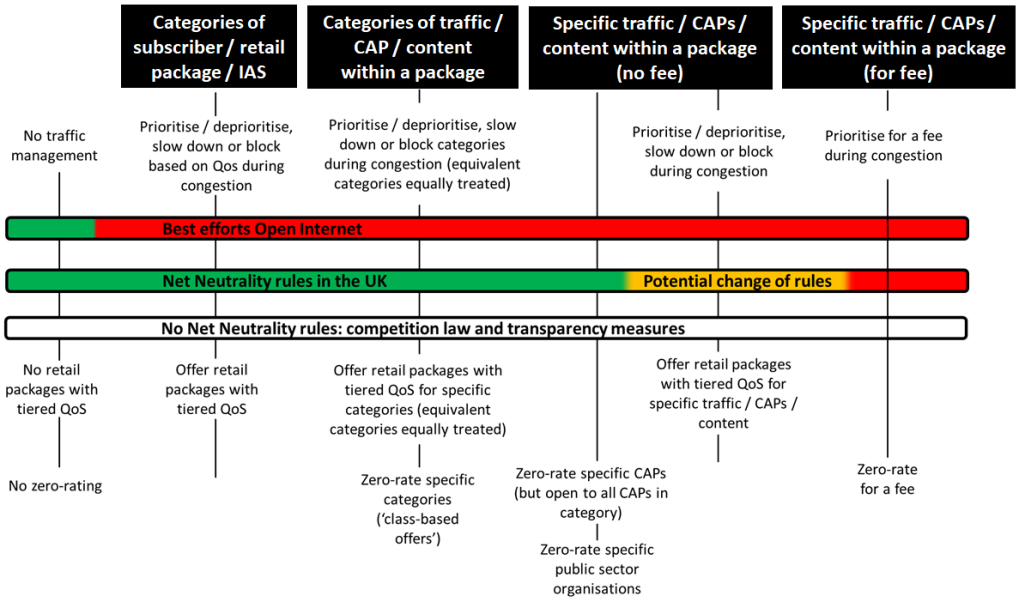
[5] The Broadband Stakeholder Group established the Open Internet Forum in 2011, which included CAPs, ISPs, Government and Ofcom. The main ISPs and MNOs signed the voluntary Traffic Management Transparency and Open Internet Code of Practice during 2012. BSG-Open-Internet-Code-2016.pdf (connectivityuk.org)
[6] Consultation, paragraphs 4.6-4.18
[7] Consultation, paragraph 4.11
[8] This includes principles about internet users being able to: i) access and distribute information and content, use and provide applications and services of their choice (subject to non-discriminatory, reasonable, transparent and proportionate network management); and ii) use devices of their choice, as long as these do not harm the security of other devices, the network or services provided over the network.

- First, whether ex-ante Net Neutrality rules are needed to protect the Open Internet at all, or whether self-regulation and ex-post competition law would suffice – the consultation does not address this question; and

- Second, if Net Neutrality rules are needed, what specific restrictions should be imposed on ISPs whilst also supporting innovation in ISPs' offers and investment in networks – the consultation suggests (rightly) that the EU rules have got this balance wrong.

Figure 1 illustrates three alternative models of regulation of the internet for the UK, each providing a different answer to these questions.

Figure 1: Three models of regulation of the internet for the UK



Source: Three

The first model is the strict 'best efforts' Open Internet, where there is no traffic management. Any prioritisation, blocking, throttling, or fast lanes would be banned – i.e. 'all bits are equal'. ISPs do not zero-rate or market retail packages with tiered QoS either.

At the other end lies the internet without Net Neutrality rules, where there are no ex-ante bans on ISPs' practices. ISPs would give customers clear information about traffic management and commit not to unfairly block,

throttle, or discriminate against lawful content (as in the UK's voluntary Open Internet Code). Ofcom and the CMA would hold ISPs to account through the application of consumer and ex-post competition law – effectively, a return to the situation in the UK before the 2016 EU rules.

In between the two, there is model reflected in current Net Neutrality rules in the UK, as modified with the legislative changes identified by Ofcom. These would allow ISPs to offer retail packages with specific content provided to different QoS; and apply traffic management measures targeted at specific content to address congestion.

We discuss each of these potential models of internet regulation below.

The best-efforts Open Internet and its shortcomings

The current UK model is de facto a 'best efforts' model, although the consultation suggests Net Neutrality rules are actually more permissive.

Today, ISPs cannot manage traffic and their ability to market innovative retail offers with different quality parameters to end users (consumers and CAPs) is extremely limited. The rules are too rigid and ISPs do not have a clear view of what is permitted, chilling investment, network management and innovation by ISPs.

As Ofcom notes, MNOs do not actively manage their network traffic. With very few exceptions, MNOs do not market retail offers with different quality parameters either.[9] This is not because they have not needed to (as suggested by the consultation), but rather because they do not think they can.

Net Neutrality rules seem to effectively prohibit MNOs from managing traffic during congestion. As discussed in Section 2, ISPs cannot treat equivalent categories of traffic equally (as required by the rules) due to encrypted and VPN traffic, which cannot be recognised or categorised.

An ISP can only comply with the rules by treating all traffic equally and on a best-efforts basis.[10] Even if they could categorise traffic, ISPs must tackle recurrent congestion from Netflix et al through capacity expansion, not traffic management anyway. Targeting traffic management at the specific content creating congestion is banned.

[9] (e.g. a recent Vodafone 5G offer differentiating packages based on speeds). Commercial zero-rating offers are also disappearing due to the increasing popularity of unlimited data packages.
[10] Consultation, paragraphs 6.94, 6.106 and footnote 233

In effect, the status quo is the same as if all traffic management had been banned. This stops MNOs from i) offering retail packages with different quality standards (which would require traffic management to differentiate between traffic of different packages); and ii) dealing with congestion during peak hours.

The best-efforts model does not provide a sustainable model for internet regulation in the UK. The model is coming under immense pressure for three related reasons discussed below (and in more detail in subsequent Sections).

Firstly, MNOs face an impossible task trying to square explosive growth in peak data traffic driven by a handful of CAPs (and the consequent need for large-scale investment in access and backhaul networks) with industry revenues in long-term decline.[11]

Unable to manage network traffic or charge these CAPs, MNOs are having to choose between over-dimensioning network capacity to meet all traffic peaks (which is inefficient and would increase consumer prices) or alternatively letting busy sites congest, treating all traffic equally and accepting whatever customer experience ensues (even if more important traffic is then lost to other traffic).

This has created significant levels of congestion, particularly for MNOs who face greater capacity constraints than fixed players. The consultation misses this because it focuses on fixed networks. Even with continuous capacity upgrades and investment, mobile capacity is not unlimited. If it cannot be profitably expanded or rationed through traffic management, the only other outcome is congestion.

Secondly, end users (consumers and CAPs) do not benefit from innovative ISP services as quickly as they should (or at all), and low-income users have limited access to cheaper, ‘no frills’ packages. Unable to manage network traffic, UK MNOs have limited scope to offer packages with different QoS standards and must sell ‘one size fits all’ offers. They are allowed to compete on price, data allowance, speeds, and little else.

The principle that ‘all bits are equal’ reflects an egalitarian view that the internet ought to be free and equal in all respects, but the market is heading towards diversity and differentiation, not uniformity. Traffic growth, technology and applications all drive demand for greater capacity, better quality and differentiation (in terms of speeds, latency,

[11] Communications Market Report 2022 – Interactive data - Ofcom

jitter, etc). MNOs need greater flexibility than can be afforded by the best-efforts internet to meet these demands.

Finally, the best-efforts internet has created a fundamental imbalance in the internet value chain in favour of CAPs. Profound structural changes have driven CAPs, ISPs, device makers and players in previously adjacent markets to compete for a piece of the value chain. Value has shifted to the content and application layers, where it is appropriated by large CAPs (i.e. Big Tech) at the expense of ISPs and the connectivity layer.

Today, consumers use ISPs' networks largely as a platform to access content and applications. A handful of CAPs (Google, Apple, Amazon, Netflix, etc) leverage market power in key parts of the value chain (devices, operating systems, content provision and app stores), acting as gatekeepers to the internet (and prioritising their traffic via CDNs) untouched by Net Neutrality regulation.

Meanwhile, the best-efforts internet model relegates the ISP to the role of commodity carrier providing commoditised connectivity and earning a diminishing share of revenues in the value chain. The ISP becomes a dumb pipe that must remain open for indiscriminate use by all CAPs (large or small), deprived of any discretion regarding who may use the network and what may be transmitted over it.

Out of this experience, regulators in the US have come to understand that the 'virtuous cycle of innovation' only encourages innovation by CAPs by holding back innovation by ISPs. The Open Internet achieves its goals by restricting the actions of ISPs and their ability to invest in the network, earn a return, and innovate. CAPs benefit from lower entry barriers, but other barriers are correspondingly erected for ISPs.

For these reasons, we welcome that Ofcom has i) included an explicit objective of safeguarding well-run, efficient and robust networks as part of its Net Neutrality review; and ii) noted that policy in this area must perform an important balancing function between protecting the Open Internet and ensuring the infrastructure the Open Internet depends upon is not put at risk.

Current Net Neutrality rules in the UK and Ofcom's suggested improvements

The second model of regulation is that reflected in current Net Neutrality rules in the UK plus a few potential legislative changes identified by Ofcom. The consultation includes a helpful overview of existing Net

Neutrality rules in the UK (which we have attempted to summarise in Figure 1 above), clarifying which ISP practices are allowed.

As one of the key concerns relates to ISPs' gatekeeper position over CAPs, the rules generally allow ISPs to offer retail packages, manage traffic, and zero-rate content and applications provided they do so in a way that is transparent and application-agnostic. Specific content, applications, and services (and specific categories thereof) should not be targeted except in very narrow circumstances.

Broadly, the dividing line between ISP practices allowed in principle and those requiring case-by-case justification seems to be whether treatment of traffic is independent of the specific application, content, or service (or categories thereof) associated with it. As shown in Figure 1, in practice this means that:

- ISPs can offer different retail packages with different QoS where all internet traffic within each individual package/IAS is treated equally – and manage traffic accordingly when networks are congested (e.g. prioritise all traffic from subscribers with a higher quality package).[12]

- Where an ISP applies different QoS to different categories of traffic, content, or applications within a package/IAS,[13] treatment of traffic is not application-agnostic and must be justified on reasonable or exceptional traffic management grounds – but this is unlikely to be problematic if equivalent categories are equally treated.[14] This could involve e.g., prioritising traffic from all video streaming applications during congestion.

- Applying different QoS to specific traffic, content, or applications within a package/IAS is generally banned – except zero-rating services from the public sector (e.g. Government, NHS); and zero-rating specific CAPs in 'class-based offers' (which are genuinely open to all CAPs of a certain category).

Ofcom seeks views on potential legislative changes to allow retail offers which provide a particular QoS for traffic associated with specific content and applications, which is currently banned. This would also require allowing traffic management targeted at specific traffic during congestion

[12] Provided the service provided to those other subscribers meets the minimum contracted level of quality. Consultation, paragraph 6.94.
[13] A traffic category is defined based on QoS requirements and contains a flow of data packets from applications with similar technical requirements, e.g. in terms of latency, jitter, packet loss, and bandwidth.
[14] Consultation, paragraph 6.94.

(e.g. prioritising a video-conferencing application only, or targeting only applications generating congestion).[15]

We welcome Ofcom's intention to provide greater flexibility to ISPs and strongly support these changes. ISPs should be able to manage their traffic and differentiate by offering different QoS tiers at different price points. We agree with Ofcom that any potential concerns can be managed through case-by-case monitoring and enforcement.

These proposals would greatly strengthen CAPs' incentives to use ISPs networks efficiently. Allowing ISPs to target traffic management at these specific applications would give CAPs stronger incentives to collaborate with ISPs and consider their impact when deciding how best to use the network (e.g. avoid busy parts of the network or deploy CDNs more extensively to minimise the impact on other users).

Allowing retail offers with a particular QoS for specific content and services (e.g. a minimum data rate guarantee for Netflix customers) would have greater impact if Three and Netflix were free to agree a charge for the service. Without a charging regime (and with ISPs unable to manage traffic for commercial considerations) we are unclear about the likely impact of the proposal on quality differentiation in the market.

More generally, however, fundamental concerns remain with the UK's ex-ante model of internet regulation that Ofcom proposes to retain, where some ISP practices are banned ex-ante[16] while others are assessed case-by-case, with Ofcom enforcing the rules and providing guidance to the industry.

The aim of an ex-ante model is to provide legal certainty by setting clear rules and restrictions in advance to shape the behaviour of 'gatekeeper ISPs' before significant harm occurs. The problem is that the ex-ante model has had the opposite effect for several reasons:

- The rules create uncertainty, holding back ISP innovation and investment – the legislation is unclear and inconsistent, with the same rules attracting different interpretations by BEREC, Ofcom, and the courts (most recently, on zero-rating).[17] Guidance must remain non-exhaustive and open-ended, with further clarifications to come and the ever-present risk of enforcement action by the

[15] Consultation, paragraphs 6.2 and 6.106-6.111.
[16] Such as blocking, throttling or applying differential treatment of traffic for commercial reasons.
[17] The ECJ's recent judgement on zero-rating is a good example of how chilling an environment the framework can prove to be for investment. Six years after the rules were put in place, and after the issuance of two full sets of BEREC guidelines, zero-rating has suddenly become effectively banned in the EU on the basis of a single judgment.

regulator. It is easier for ISPs to treat all traffic the same and put investment and innovation on hold; and

- The ex-ante model is too inflexible for a rapidly changing internet ('innovation by permission') – the market is heading towards diversity in retail packages and quality differentiation. The UK needs a flexible, more permissive model where ISPs are free to test, innovate and launch new propositions without needing to justify them (to courts or regulators) upfront.

These shortcomings are going to be particularly problematic for the provision of specialised services in 5G, where additional flexibility will be needed. A service deemed specialised today may not qualify in the future (as optimisation may no longer be objectively necessary), and new services will emerge that need to be optimised. Having Ofcom assess on a case-by-case basis whether a new service qualifies as specialised is not a good model to encourage innovation in the future.

The internet without Net Neutrality rules

The final model of internet regulation involves repealing ex-ante Net Neutrality rules (as the US has done) and returning to the ex-post model that existed in the UK before the 2016 EU rules – essentially, light touch regulation where competition between ISPs acts as a natural constraint against any attempts to compromise the Open Internet.

In this model, ISPs would give customers clear information about their traffic management practices and commit not to block, throttle, or discriminate against lawful content in an anti-competitive way (as in the UK's voluntary Open Internet Code).

ISPs would then be held to their public commitments by strong retail competition, consumer legislation and ex-post competition law. The CMA and Ofcom would review practices and resolve disputes on a case-by-case basis after they have occurred (ex-post), in lieu of having ex-ante regulation to anticipate and resolve problems before they materialise.

This ex-post model can protect the core principles of Net Neutrality – unfettered access to the entire (lawful) internet, no anticompetitive blocking, throttling or discrimination and transparency about ISPs' practices – without the need for intrusive ex-ante regulation.

Ofcom should consider explicitly why retail competition, self-regulation by ISPs, basic transparency rules and ex-post competition law cannot be expected to regulate ISP conduct, as they do in most other sectors of the

UK economy. The consultation simply assumes the rules ought to be preserved (due to ISPs' gatekeeper position and limited transparency incentives).

Ofcom should assess the benefits of removing regulation, letting two-sided markets develop and allowing ISPs and CAPs the freedom to explore new business models that result in greater quality differentiation, reduced congestion, and more efficient investment in networks.

An ex-post model is better suited to the dynamic nature of the internet. When an action by an ISP can be beneficial or anti-competitive (depending on the circumstances) and needs to be evaluated on its merits, the best approach is generally to intervene ex-post, if and when harm occurs.

Rather than banning conduct (or requiring permission by the regulator) ex-ante, it is preferable to give MNOs freedom to develop commercial propositions and traffic management practices, and only intervene ex-post if an ISP has abused its freedom in an anti-competitive way. Ex-ante regulation can chill investment and innovation unnecessarily, while ex-post intervention, properly conducted, does not.

In a competitive mobile market, there is nothing inherently wrong about an MNO treating specific applications differently, prioritising certain services during congestion, or ensuring that certain customers can receive a better quality of service for a specific application.

If Three decides to offer, say, unlimited voice, data, and a minimum data rate for [✂] users (or targets traffic management at [✂] content to avoid congestion), this should not be automatically construed as anti-competitive or prevented by regulation.

It is instructive to consider events in the US – the birthplace of Net Neutrality – where the shortcomings of the rigid Open Internet model have led to the repeal of federal Net Neutrality legislation. Under new leadership, the FCC has moved to reverse the tide of regulation by repealing the 2015 Open Internet Order and adopting instead the 2017 'Restoring Internet Freedom' order.

Key to the FCC's decision was its assessment that rigid Net Neutrality regulation in the US was stifling ISP innovation and dynamism in the marketplace and reducing investment in high-speed networks. The decision also reflected a changed view within the FCC that the greatest threat to the Open Internet was not the ISP, but rather a handful of CAPs (i.e. Big Tech) operating further up the value chain.

Which way forward for Net neutrality in the UK?

In summary, the UK's departure from the EU provides an opportunity to review the Net Neutrality framework and consider whether any changes are required. Free from the encumbrances of heavy-handed EU regulation, the UK is now free to adopt its own model of internet regulation.

Three believes that Ofcom should recommend a repeal of Net Neutrality rules in the UK to Government, including a return to the light touch model of self-regulation and ex-post competition law that previously existed in the UK and which is now being followed in the US.

From the perspective of an MNO, the 'best-efforts' model in the UK today does not provide a sustainable template for future internet regulation in the UK. The principle of 'all bits are equal' that sits at the heart of the model is not sufficiently flexible to accommodate changes in consumer demand and technology.

We welcome Ofcom's intention to provide greater flexibility to ISPs, but we remain concerned that more fundamental change is needed to ensure regulation is an enabler and not a barrier to innovation in the internet engine.

Most importantly, we think the UK needs a more flexible model that can adapt to a rapidly changing market, meet the challenge of explosive growth in data traffic, protect investment in infrastructure by ISPs and cater to the growing demand for competitive differentiation, competition on quality, and innovation by both CAPs and ISPs.

In the words of Ben Thompson, a respected US technology analyst:[18]

"The question that must be grappled with… is whether or not the Internet is 'done.' By that I mean that today's bandwidth is all we will need, which means we can risk chilling investment through prophylactic regulation and the elimination of price signals that may spur infrastructure build-out.

If we are "done", then the potential harm of [Net Neutrality regulation] is much lower; sure, ISPs will have to do more paperwork, but honestly, they're just a bunch of mean monopolists anyways, right? Best to get laws in place to preserve what we have.

[18] Ben Thompson, "Light Touch", Cable, and DSL: the Broadband Tradeoff. https://stratechery.com/2017/light-touch-cable-and-dsl-the-broadband-tradeoff-the-importance-of-antitrust/ (Nov. 29, 2017).

But what if we aren't done? What if virtual reality with dual 8k displays actually becomes something meaningful? What if those imagined remote medicine applications are actually developed? What if the Internet of Things moves beyond this messy experimentation phase and into real-time value generation, not just in the home but in all kinds of unimagined commercial applications? I certainly hope we will have the bandwidth to support all of that!"

2. Net Neutrality rules have created excessive congestion and have reduced quality competition in mobile.

Executive Summary

Traffic management is one of the core issues of the Net Neutrality debate. This section briefly discusses 'traffic management' and its potential to help MNOs address explosive growth in mobile data traffic during peak hours.

We set out our understanding of Net Neutrality rules on traffic management and how Ofcom has enforced them. The UK follows largely a 'best efforts' model in practice – i.e. where MNOs treat all traffic the same – because the rules do not seem to allow ISPs to manage their traffic, and ISPs do not have a clear understanding of what practices are permitted anyway.

We then assess the outcomes of this framework from the perspective of an MNO, concluding that the current model of ex-ante regulation has created excessive congestion in mobile networks and has unduly restricted competition and differentiation on mobile quality.

As discussed in Section 1, Three advocates a repeal of Net Neutrality rules in the UK. Failing this, Ofcom should at least endorse the legislative changes it has identified to allow MNOs to: i) target traffic management at specific content and applications; and ii) market retail offers with different levels of quality for individual content and applications.

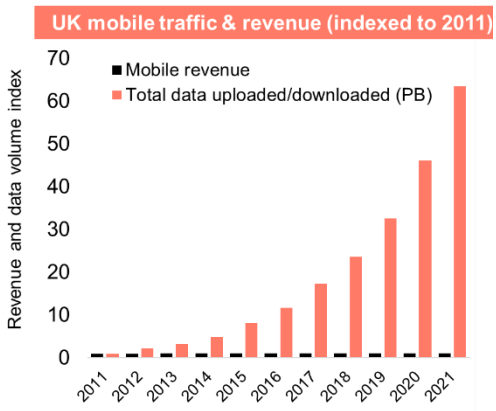
These changes would enable MNOs to address congestion and would also encourage greater retail competition on a wider range of quality dimensions (beyond price, technology, and data allowance).

How traffic management could help MNOs address traffic growth

Mobile traffic in the UK continues to grow (by c40% on average between 2013 to 2021), but UK mobile revenues are in long-term decline.[19] A handful of CAPs drive most of this growth, as shown in Figure 2 below.

[19] Connected Nations 2022: UK report (ofcom.org.uk)

Figure 2: A handful of CAPs drive mobile traffic growth in the UK



[✂]

Source: Ofcom, Three

Growth in data traffic during peak hours poses a key challenge, particularly for MNOs which face greater capacity constraints than fixed operators. Capacity in the RAN is shared between users, so the service is degraded when too many people access the network at the same time.

An MNO can address peak traffic growth by either i) expanding capacity in the RAN (i.e. adding new sites, deploying more spectrum or upgrading to a more efficient technology); or ii) rationing RAN capacity through traffic management. We discuss each in turn.

Addressing growth in peak data traffic through capacity expansion

In mobile, the Radio Access Network (RAN) is the constraining factor. Congestion is localised and occurs on a site-by-site basis. Network load is very unevenly distributed across sites.

An MNO dimensions its RAN to provide a minimum level of service during peak hours. The capacity of a base station is limited by the amount of spectrum and technology (e.g., 4G, 5G) deployed. As cell load increases, average customer speeds reduce, and the cell can become congested. As mobile traffic keeps growing, peak-hour traffic increases across the network and more sites become congested.

There are two types of congestion in mobile: regularly occurring congestion and unpredictable congestion.

Regularly occurring congestion is due to traffic levels increasing gradually over time across the network, causing typical usage peaks to breach capacity on certain cells on a regular basis.

Three has a capacity management process to determine when capacity needs to be added on individual sites. This requires planning because capacity upgrades are not instantaneous and typically require planning permission and work on site.[20] [✂]

Ideally, MNOs would plan capacity upgrades to ensure they can carry all expected traffic at the busy hour, and before the onset of regularly occurring congestion. In practice, this is not how things work because site upgrades are costly and some of the costs involved are fixed.

Hence, there may be no business case to upgrade capacity on individual sites, and an MNO may decide to wait until enough sites need upgrading before deploying new capacity. [✂] .[21] The congestion status of a site is one of the factors used to decide whether it should be prioritised for an upgrade.

The other type of congestion – unpredictable congestion – is due to unexpected changes in traffic patterns (e.g. one-off events like an emergency, a street party, a music festival, etc). This can create exceptional traffic peaks and congestion (i.e. when demand materially exceeds usual network load in the busy hour) that cannot usually be predicted or planned for.

In either case, even with continuous upgrades and constant investment in additional capacity, the fact remains that mobile capacity is not unlimited. It is simply not possible to provide sufficient capacity to meet all eventualities on all sites during peak hours (and consumers would not be willing to pay the costs of such a system anyway). The key is to ensure ISPs have the tools to manage congestion and keep it at optimal levels, which is not currently the case.

Addressing growth in peak data traffic via capacity rationing – i.e. traffic management

The alternative to capacity expansion is to ration existing capacity through traffic management. This encompasses a range of technologies that allow ISPs to treat different types of traffic differently, allowing them

[20] e.g. require planning approval, strengthening a mast, deploying new spectrum, adding a site nearby, rigging work, etc.
[21] [✂]

to manage the network in times of congestion, or when some subscribers use a disproportionate share of capacity.

Traffic management ensures that finite capacity is optimally used to deliver the desired QoS during congestion.[22] It can be applied to individual users (e.g. subscribers who have exceeded a subscription allowance), or types of traffic (e.g. P2P, web browsing, video streaming, gaming, etc.). This may be done in one of two ways (or dynamically between both):

- **Packet prioritisation** – i.e. differentiate type of traffic by category (or user) and assign different priorities to each type.[23] When the network becomes congested, data packets marked as higher priority have a higher likelihood of being delivered, while lower priority packets are delayed or dropped.[24]

- **Bandwidth allocation** – i.e. this is used to control the data rate offered to a user or type of traffic. For instance, a user can be offered a minimum guaranteed data rate, or usage can be capped at a maximum data rate (e.g. when a data allowance has been exceeded, or when the user roams abroad).

Traffic management is used to manage network resources as capacity limits on a site are approached. Capacity is not unlimited, even with continuous upgrades and constant investment. Traffic management rations capacity and ensures a certain QoS to users when, for whatever reason, the business case does not justify deploying extra capacity at individual sites.

When it is allowed, traffic management enables ISPs to offer packages with different QoS (e.g. prioritised packages or offers with a minimum guaranteed data rate), allowing them to differentiate on quality and 'upsell' customers onto higher quality packages.

The following section explains that MNOs in the UK are not allowed to manage traffic in times of congestion. This means an MNO has no option but to invest in providing capacity for all eventualities (which is not possible) or allow sites in busy areas to congest during peak hours.

[22] Traffic management can be explicit (ie when an ISP prioritises a category of traffic or user type) or implicit (i.e. when an ISP dimensions its network to effectively discriminate between traffic categories, such as allocating more spectrum to one service or by allowing a CAP to deploy a Content Delivery Network (CDN) on the ISP's data centres, which reduces the likelihood that customers of that particular CAP will experience congestion.
[23] The network assigns a QoS Class Identifier (QCI) to each traffic category or user, with every QCI associated with a priority level.
[24] For instance, traffic from subscribers using a disproportionate share of bandwidth can temporarily be assigned a lower priority status and returned to normal priority status once his or her bandwidth usage drops below a set threshold over a particular time interval

Current NN rules prevent ISPs from managing network traffic

Current law implements an extreme formulation of Net Neutrality principles

An extreme 'Open Internet' would treat all traffic equally and without exception – i.e. 'all bits are equal'. In practice, this best-efforts model is the one currently applied in the UK.

The status quo is similar to a flat 'no blocking, no throttling, no prioritisation' rule. Net Neutrality requires ISPs to treat all traffic equally when providing an IAS. Two exceptions apply:

- ISPs are allowed to apply '**reasonable' traffic management** – but this must be based on objectively different technical quality of service requirements (not commercial reasons) of specific traffic categories (such as e-mail, P2P, etc.), must be transparent, non-discriminatory, and proportionate, must not monitor specific content and must not be maintained for longer than necessary; and

- **'Exceptional' traffic management** (such as blocking, throttling, or discriminating between CAPs) is banned except in three exceptional cases – i) to comply with UK law; ii) preserve network integrity and security; and iii) to prevent 'impending' congestion and mitigate the effects of 'temporary'[25] or 'exceptional'[26] congestion, and then only provided that equivalent categories of traffic are treated equally and measures are applied only for as long as necessary.

An ISP cannot invoke 'exceptional traffic management' if the network is frequently congested due to 'under-investment or capacity scarcity'.[27] 'Recurrent', longer-lasting network congestion must be addressed by expanding network capacity.

In effect, these rules prohibit MNOs from managing traffic during congestion. First, ISPs cannot meet the requirement of treating equivalent categories of traffic equally, because a significant share of traffic (e.g. encrypted or VPN traffic) cannot be recognised or categorised

[25] Sudden increases in demand (e.g. in the number of users in addition to the regular users, or a sudden increase in demand for specific content, applications or services), which, even if predictable, might not recur so often (or for such extensive periods) that capacity expansion is economically justified
[26] Unpredictable and unavoidable congestion beyond the control of providers of ISP (e.g. due to a damaged site).
[27] Q&A - Roaming charges and open Internet (europa.eu)

(e.g. as video streaming, browsing, etc).[28] An ISP does not know what's inside. As Ofcom notes, when an ISP cannot consistently categorise traffic, it can only comply with the rules by treating all traffic equally on a best-efforts basis.[29]

Even if they could categorise traffic, ISPs must tackle recurrent congestion – i.e. typical traffic peaks regularly breaching network capacity due to gradually increasing traffic over time from Netflix et al – through capacity expansion, not traffic management. Targeting traffic management at the specific content and applications creating congestion is banned.

In effect, the status quo is the same as if all traffic management had been banned. This stops MNOs from i) offering retail packages with different quality standards (as it would require traffic management to differentiate between traffic of different packages); and ii) dealing with congestion during peak hours.

Ofcom's interpretation of Net Neutrality rules to date has been too restrictive

UK MNOs used to manage traffic to tackle actual or impending congestion. This was mostly to limit excessive use by heavy users (e.g. using a handset as a hotspot for other devices),[30] or ease capacity pressures from video streaming (e.g., by limiting video to SD).

However, Ofcom's enforcement action in 2018 against Three, Vodafone and O2 put an end to these practices. Ofcom asked these operators to withdraw various traffic management measures and similar policies which were seen to conflict with Net Neutrality rules, namely:

- All tethering[31] and device restrictions limiting use of handset SIMs in Mi-Fi devices[32] – this mostly affected Three's customers on our Essential plans, who until then could not use their handset as a 'hotspot' to connect other devices to the internet or use their handset as a Home Broadband Wi-Fi device.

[28] An ISP relies on information provided by applications when data packets are sent to its network to identify which data packets belong to which categories of traffic
[29] Consultation, paras 6.94, 6.106 and footnote 233
[30] To implement this, typical MNO policies included restrictions on P2P and/or tethering, or Fair Use policies that allowed certain services (e.g. browsing and emails) but not others (e.g. video streaming) once a data allowance was exceeded.
[31] This allows an end-user to share the internet connection of a mobile phone or tablet with other devices such as laptops, etc, so the smartphone becomes a Wi-Fi connection.
[32] MiFis or MiFi dongles are wireless devices that enable multiple users to share a single mobile broadband connection while on the go.

- Slowing down traffic whilst roaming – Three was throttling some categories of traffic, such as video, P2P and VPN traffic when customers were roaming.

- Restricting video streams to SD on some services (e.g. Vodafone customers purchasing its Video Pass) or all services (e.g. O2's use of 'rate control' for streamed video which was compressed to 1 Mbps at all times) and use of compression techniques for streamed video, web content and images (O2).[33]

- Prioritising higher-priority over non-time-critical traffic during peak hours in London (e.g. O2's use of the 'Vasona' platform to prioritise video and social media traffic during times of temporary network congestion).

Ofcom objected on the basis that these practices were not reasonable traffic management, or were in place permanently, or, when they were not, that the frequency of application or average duration was unclear.[34] In essence, Ofcom signalled in 2018 that basic traffic management measures were impermissible. This has had a chilling effect on traffic management in the UK.

An overly restrictive set of rules (and enforcement of those by Ofcom) denies ISPs any discretion in deciding which CAPs' traffic to carry (except for any unlawful material). ISPs are compelled to open their networks for use by all CAPs, thereby depriving them of all discretion regarding who may exploit their networks and what may be transmitted over them.

As shown in Table 1, Three [✂]

Table 1: [✂]

[✂]

Source: Three

[33] Three managed video, P2P and VPN traffic when customers roamed in the EU. Vodafone restricted video traffic to customers using its Video Pass to SD. O2 used 'rate control' for streamed video content (which was compressed to 1 Mbps at all times) and applied compression techniques at all times to web content and images.
[34] ofcom-approach-net-neutrality.pdf

Consumer outcomes from traffic management rules in mobile

Today, MNOs face an impossible task trying to square explosive growth in peak data traffic driven by a handful of CAPs (and the consequent need for large scale investment in access and backhaul networks) with industry revenues in long-term decline.[35]

A heavy-handed approach to regulating internet conduct is restricting MNOs' ability to manage their networks (at a time when data traffic is growing exponentially) and limiting their ability to compete on quality. Mobile data is provided on a best-efforts basis and without quality assurance.

Overly restrictive Net Neutrality rules on traffic management have delivered the following outcomes in mobile:

- **Significant levels of congestion and a degraded quality of service** – if an MNO is unable to ration demand by managing peak-hour traffic, it must choose between over-building capacity to meet all traffic peaks (which is not possible), or let busy sites congest, treat all traffic equally and accept whatever customer experience ensues; and

- **Limited choice, competition on quality and quality differentiation** –end users do not benefit from innovative ISP services as quickly as they should (or at all), and low-income users have limited access to cheaper, 'no frills' packages. MNOs have limited scope to offer packages with different QoS standards and must sell 'one size fits all' offers. They are allowed to compete on price, data allowance, speeds, and little else.

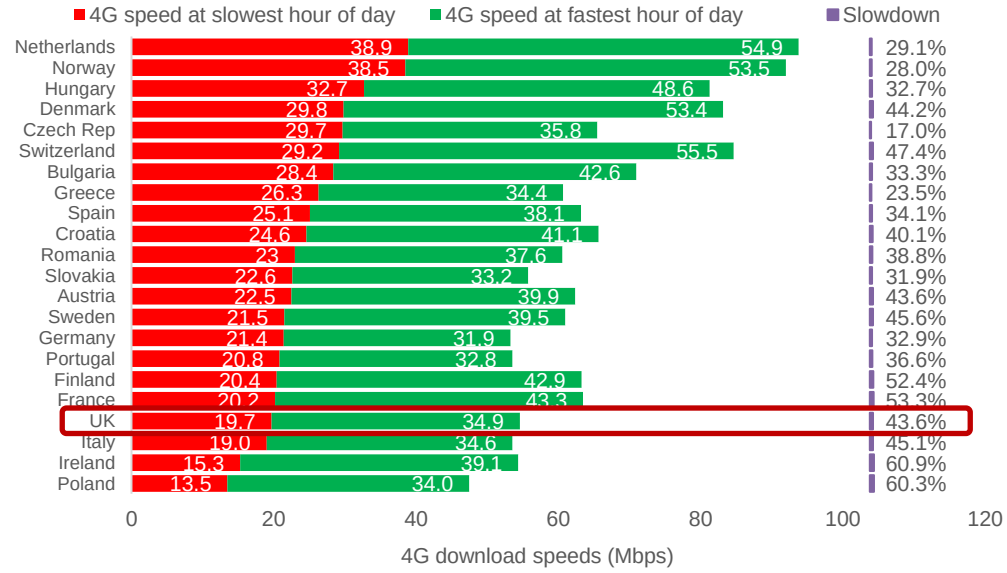
Net Neutrality rules have created significant congestion in busy areas during peak times

The consultation finds that ISPs have invested significant amounts to carry all expected traffic during the busy hour. In Ofcom's view, network congestion is not currently a significant issue for operators.[36] Ofcom seems to have missed a serious problem with congestion in UK mobile networks, likely because the consultation seems to focus on fixed networks.[37]

[35] Communications Market Report 2022 – Interactive data - Ofcom
[36] Consultation, paragraph 6.22.
[37] Consultation, paragraph. 6.71

A study by OpenSignal shows that UK mobile networks are particularly impacted by congestion. The study assesses congestion in 4G networks in 77 countries, including 22 European countries,[38] comparing average 4G download speeds in quiet and peak hours of the day in each country.

Figure 3: UK 4G networks are being impacted by congestion.



Source: OpenSignal 'The 5G opportunity. How 5G will solve the congestion problem of today's 4G networks' (Feb 2019)

OpenSignal finds that most European countries maintain a minimum level of service (20Mbps average download speeds) during peak hours. The UK is one of four exceptions. Furthermore, consumers in other countries are less impacted by service degradation during the peak. The UK ranks 10th in terms of fluctuation in speeds, with download speeds slowing down by 44% in the peak hour.[39]

[✂]

[38] See Countries Ranked by 4G Download Speed at Different Times of Day - ISPreview UK. The study is available here the_5g_opportunity_report_february_2019_0_0.pdf (opensignal.com)

[39] OpenSignal reports wild swings in 4G speeds in London being particularly impacted (ranging from 17.5Mbps to 38.3Mbps). The only European city in the OpenSignal sample with more extreme speed fluctuations is Paris.

Figure 4: 4G networks in the UK are showing signs of congestion.

Source: [✂]

This suggests that MNOs do not currently have the tools they need to address congestion effectively and are forced to deliver traffic on a best-efforts basis.

Beyond congestion, a de facto ban of all differential treatment of data packets prevents different services, applications, and content from obtaining the quality of service they need to function efficiently.

At present, latency-sensitive applications like streaming video are given the same priority as email or large file transfers; an Internet VoIP emergency call is treated no differently than a YouTube download; and a telemedicine application is handled in the same way as the contents of a Web page.

Indeed, this effectively discriminates against quality of service-sensitive applications (like streaming video and VoIP) that do not function reliably unless afforded some prioritisation that other applications do not need.

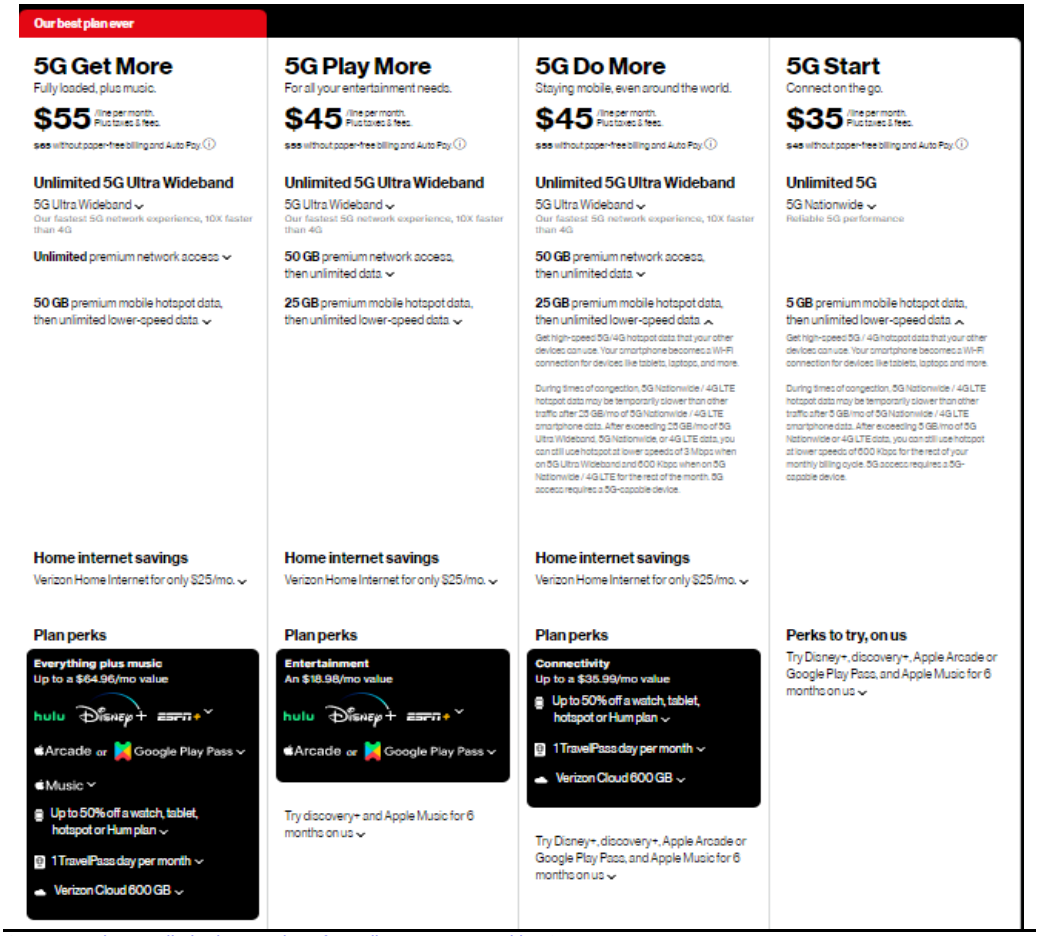
Net Neutrality rules prevent quality differentiation, ISP innovation and consumer choice

The rules restrict service quality, competition on quality, consumer choice and ISP innovation. ISPs need traffic management to offer packages with different QoS (e.g. to prioritise better quality packages or guarantee a data rate). This means end users are not benefiting from innovative ISP services as quickly as they should (or at all).

MNOs compete largely based on price, coverage or data allowance but competition on other quality dimensions is muted. There is limited scope to offer packages with different QoS standards. Low-income users have limited access to cheaper, 'no frills' offer (e.g. without tethering by

default). This contrasts with the situation in the US, where MNOs already offer 5G packages differentiated on quality.

Figure 5: Verizon's 5G plans



Source: Verizon Unlimited Data Plans for Talk & Text, Now with 5G

Our proposed way forward for traffic management in the UK

The consultation finds that current rules on traffic management may prove too restrictive in the future due to expected growth in traffic and demand for retail packages of varying quality.[40]

Ofcom seeks views on potential legislative changes to allow retail offers which provide a particular QoS for traffic associated with specific content and applications, which is currently banned. This would also require

[40] Consultation, paragraph 6.34

allowing traffic management targeted at specific traffic during congestion (e.g. prioritising a video-conferencing application only, or targeting only applications generating congestion).[41]

We welcome Ofcom's intention to provide greater flexibility to ISPs and strongly support these changes. ISPs should be able to manage their traffic and differentiate by offering different QoS tiers at different price points. We agree with Ofcom that any potential concerns can be managed through case-by-case monitoring and enforcement.

These proposals would greatly strengthen CAPs' incentives to use ISPs networks efficiently. Allowing ISPs to target traffic management at these specific applications would give CAPs stronger incentives to collaborate with ISPs and consider their impact when deciding how best to use the network (e.g. avoid busy parts of the network or deploy CDNs more extensively to minimise the impact on other users).

Allowing retail offers with a particular QoS for specific content and services (e.g. a minimum data rate guarantee for Netflix customers) would have greater impact if Three and Netflix were free to agree a charge for the service. Without a charging regime (and with ISPs unable to manage traffic for commercial considerations) we are unclear about the likely impact of the proposal on quality differentiation in the market.

More generally, however, fundamental concerns remain with the UK's ex-ante model of internet regulation that Ofcom proposes to retain. As discussed in Section 1, Three advocates a return to the light touch model of self-regulation and ex-post competition law that previously existed in the UK (and which is now being followed in the US).

[41] Consultation, paragraphs 6.2 and 6.106-6.111.

3. Net Neutrality rules prevent the internet operating as a two-sided market, harming consumers.

Executive Summary

ISPs participate in a two-sided market – consumers buy internet access from ISPs and CAPs access ISPs' networks to reach consumers. In the UK, there is increasing industry interest in commercial models where ISPs develop innovative services that broadcasters, gaming providers and other CAPs can buy into to best showcase their products.

In principle, ISPs could recover their costs from both sides of the market – just as newspapers charge both advertisers and readers. However, Net Neutrality rules limit ISPs to recovering costs from their subscribers.

We explain that, currently, ISPs and CAPs cannot agree innovative deals whereby CAPs agree to pay ISPs to make their content and applications available to UK consumers. 'Two-sided' offers (such as sponsored data plans, or zero-rated offers paid by the CAP) already exist in the US but would not be allowed in the UK. There is nothing intrinsically problematic about these offers and they should not be subjected to blanket bans.

We discuss that CAPs do not always consider their impact on MNOs' networks in deciding when and how to deliver their content, causing wasted network investment, higher mobile prices, and congested networks. Further, the current rules undermine MNOs' incentives and ability to invest in their networks – reducing quality for all consumers.

Lastly, we set out the case for CAPs making payments to ISPs. We note that the EC will soon consult on whether digital platforms should contribute to telecoms networks. We consider the benefits of a charging regime, proposing an obligation on large CAPs to negotiate terms with ISPs (with arbitration as a fallback).

Internet access is a two-sided market

Two-sided markets include some of the most important sectors of the UK economy.[42] In telecoms, consumers buy internet access from ISPs and CAPs need access to ISPs' networks to reach consumers. ISPs must get consumers and CAPs on board to succeed.

A two-sided market features positive externalities, where the value to the users on one side increases with the number of users on the other side. For instance, ISP customers value access more highly if they can access

[42] Such as estate agents (which liaise between house sellers and buyers), payment card schemes (like Visa and MasterCard, which link card users to merchants), newspapers (advertisers and readers), free-to-air TV stations (advertisers and viewers), video game platforms (gamers and developers) and App Stores (developers and app users).

a greater range of content from CAPs, and CAPs value being able to reach a larger number of subscribers.

Typically, users are unable to internalise these externalities themselves.[43] A platform is needed to bring both sides on board, profiting itself and society by internalising these externalities and setting both:

- **The pricing level** – i.e. the combined price charged to both sides. As in other markets, this depends on the extent of market power the platform has and may be related to the costs of serving both types of customers, depending on entry barriers; and

- **The pricing structure** – i.e. the relative prices charged on either side of the platform, or split of revenues between the two sides, which is not necessarily related to the cost of serving that side.

The price structure is less likely to be distorted by market power than the overall price level. The pricing structure aims to balance demand on both sides (not recover the costs of serving each side), so the platform must consider how charging one side will impact demand on the other side.

There is typically no relationship between price and cost on either side of a two-sided market by itself (as platform costs arise jointly and cannot be attributed to either side). Typically, the platform earns most revenues from one side, while profits are less (or even negative) on the other. For instance, estate agents charge sellers only and the main national newspapers charge readers but also rely on revenue from advertisers.

Net Neutrality regulation artificially sets the price of one side of the telecoms market (the side of the CAPs) to zero. This means that the platform (the ISP) is unable to set the price level and structure as it would in a properly functioning two-sided market, leading to potentially inefficient outcomes where the number of participants in the market is not maximised.

The prohibition on charging CAPs stifles innovation and encourages CAPs to use ISP networks inefficiently

As Ofcom explains, ISPs are effectively unable to charge CAPs for carrying or prioritising their traffic due to current Net neutrality rules. There is no express prohibition on ISPs charging CAPs, but there is no

[43] E.g. each house seller benefits from having many potential buyers viewing their house and each buyer benefits from all the houses visited but it is not practical for either party to compensate the other.

legal or regulatory obligation on CAPs to negotiate and CAPs do not need to engage with ISPs for their traffic to be carried.[44]

This de facto prohibition harms consumers in three main ways:

- CAPs and ISPs are not free to agree innovative propositions that benefit all sides of the two-sided market – subscribers, CAPs and ISPs.

- CAPs have insufficient incentives to use ISP networks efficiently – causing wasted investment, higher broadband prices and more congested networks.

- The rules undermine MNOs' incentives and ability to invest – reducing quality of service for all consumers.

CAPs and ISPs are not free to agree innovative propositions that benefit all sides of the two-sided market

Today, the prohibition on charging CAPs means consumers must bear all the costs, even if CAPs clearly benefit from having access to more consumers. In this 'consumer-pays-all' model, subscribers pay higher prices than they would under a charging regime, which artificially depresses subscriptions and reduces value to CAPs at the other end.

This model becomes increasingly unsustainable as MNOs continue to make huge investments to meet demand from bandwidth-intensive applications used only by some subscribers (such as YouTube or Netflix).

Thus, there is increasing industry interest in commercial models where ISPs develop innovative services that broadcasters, gaming providers and other CAPs can buy into to market their products. Allowing ISPs to charge both CAPs and subscribers can lead to 'win-win' situation where all parties (and not just CAPs) benefit.

This type of 'two-sided' model already exists in the US. Sponsored data plans give subscribers access to free (or zero-rated) content (e.g. Netflix) paid by the CAP.[45] This is essentially a zero-rating offer where the CAP pays the ISP to zero-rate the content.

These plans benefit subscribers, CAPs and ISPs:

[44] Consultation, paragraph 7.6.
[45] Such as AT&T's sponsored data plan or Verizon FreeBee Data

- Subscribers have greater choice and can access content without using up their data allowance.

- CAPs can deliver their content, services and applications to a larger audience, differentiate in the market and tailor services to consumers' demand.

- ISPs earn additional revenues to invest in network infrastructure and innovative propositions aimed at subscribers and CAPs.

There seems to be no good reason to impose a blanket ban on these offers. Depending on how they are structured, these and other 'two-sided' offers could be perfectly competitive and benefit consumers, but are not currently allowed by an overly restrictive framework.

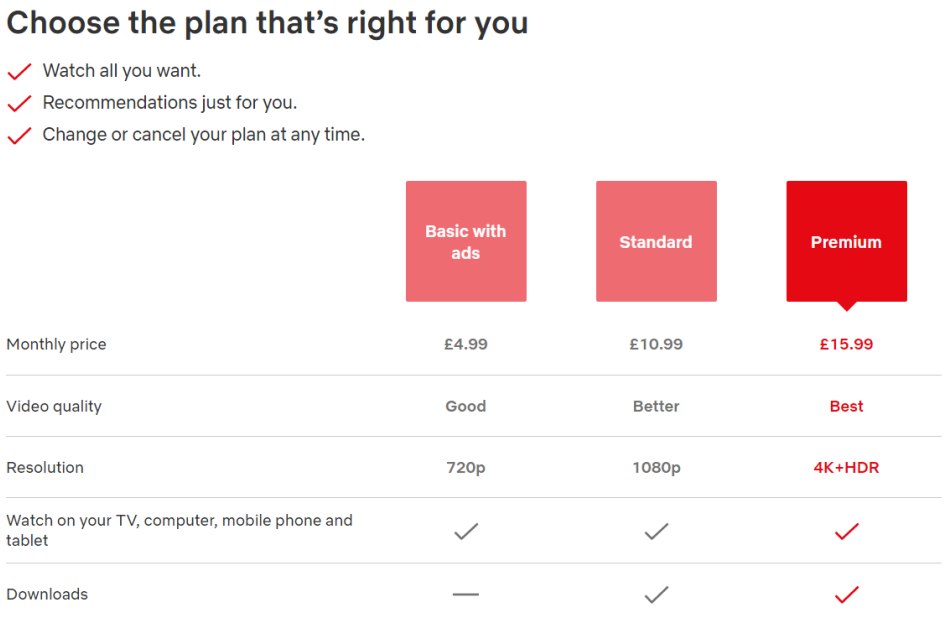
CAPs have insufficient incentives to use ISP networks efficiently

Ofcom believes the largest CAPs already invest to improve efficiency of traffic delivery. In Ofcom's view, a charging regime could strengthen these incentives but the scope for further improvements is unclear.[46]

The simple fact is that CAPs need not consider the costs they impose on ISPs when making decisions and therefore have insufficient incentives to use ISP networks efficiently. For example, Netflix charges more for higher-quality video but ISPs must pick up the extra costs. The ISP's entire subscriber base (not just Netflix viewers) will be impacted if this traffic causes congestion during peak hours.

[46] Consultation, paragraph 7.39.

Figure 6: Netflix plans



Source: Netflix

CAPs take measures purely to benefit themselves, i.e. give better quality of service to their own customers. Sometimes, these decisions are well-aligned with the interest of an ISP and its subscribers – e.g. when CAPs and ISPs agree to deploy a CDN to bring content closer to users and maintain a certain level of quality that benefits all users.

Other times, however, incentives are not aligned. CAPs can and do make decisions with no consideration of the impact on an ISP's network or other ISP subscribers (beyond those who also subscribe to the CAP's service) in terms of cost and congestion. This was seen during the pandemic, when Ofcom and the EC asked streaming giants to reduce video resolution to stop traffic spikes from breaking the UK's networks.

Below we discuss two specific examples involving the timing and method of delivery of CAPs' traffic.

The timing of CAPs' traffic

As Ofcom notes, in some cases traffic on the internet is initiated by a request from the ISP's retail customer (e.g. starting a Netflix show), so a CAP cannot fully control the timing. In many cases, however, a CAP can control:

- When certain content (such as games and software updates) is released.

- When content is downloaded in the background – e.g. Netflix and Amazon Prime offer the ability to automatically download content to be watched at a later date.

- Whether content is automatically streamed or downloaded – e.g. several video content providers automatically play the next episode (without the user requesting it), and certain apps and websites pre-load content (such as videos or webpages) in anticipation of users requesting it.

When deciding when best to release this content, CAPs can be expected to consider the impact on its own subscribers, not necessarily the optimal timing from the perspective of the ISP (and its entire subscriber base).

The methods that CAPs use to deliver traffic

We recognise that CAPs do take some measures that improve traffic delivery, but these do not always consider the wider impact on an ISPs' costs and congestion. There are several examples of practices by CAPs that are inefficient and suboptimal, namely:

- Examples of CAPs wasting bandwidth – e.g. Netflix does not always reduce resolution when video is played on mobile phones, despite this higher resolution being unusable on mobile. This wastes bandwidth and delivers no benefit to users.

- Explore more efficient methods of distributing bandwidth-intensive, performance-sensitive content – such as caching,[47] peering, and multicasting.[48] Many CAPs already use these, but many others do not in circumstances where use would be efficient, i.e. the savings to ISPs would outweigh the costs to the CAPs.

- Using Content Delivery Networks (CDNs) does not prevent congestion on MNOs' networks – CAPs can cache their content so it does not pass-through MNOs' core networks, but it must still pass through the RAN (i.e. mobile sites), which can cause congestion and reduce quality of service (as per Section 2).

[47] Where a content provider stores content on cache servers located within access/aggregation networks.
[48] Where a distant access network's routers instantaneously replicate and route multiple copies of packets to many different points within its access/aggregation network

Current Net Neutrality rules undermine MNOs' incentives and ability to invest, reducing quality of service for all consumers

Ofcom argues that:

- It has seen no evidence that the Net Neutrality regime reduces an ISP's ability to recover future investment costs.[49]
- ISPs can charge subscribers to cover their costs and are still planning to invest – with most major ISPs forecasting similar nominal expenditure in 2022-2026 compared to 2017-2022.
- ISPs can increase revenues by investing in higher capacity or innovative network services – e.g. selling premium services like high quality broadband or 5G enterprise services.

First, the current regime reduces ISPs' ability to recover investment costs because they can only recover them from one side of the market. As a result, some potential network investments that would be economically viable if the two-sided market operated properly do not go ahead, to the detriment of ISPs' retail customers.

Second, while ISPs can charge subscribers, they are unable to optimally balance demand on both sides of the market – for instance by [✂]. As discussed above, in a two-sided market charging only one side may not be optimal or efficient.

Third, Ofcom explains that most major ISPs expect to maintain their expenditure in nominal levels over the period 2022 to 2026, which is likely to equate to a cut of approximately 25-30% in real terms. Further, the question is not how much ISPs plan to invest under the current regime, but how much more they would invest if it was possible for ISPs and CAPs to explore and agree new business models and charges.

Ofcom's analysis (in its Mobile Strategy Review) shows that two of the four MNOs are earning returns below the cost of capital and the potential demand for services such as 5G enterprise is uncertain. It is not safe for Ofcom to find that these services may boost ISPs' financial performance.

The case for CAPs making payments to ISPs

We first set out the case for allowing operators the freedom to operate as a two-sided market, including CAPs making payments to ISPs, and note

[49] Consultation, paragraph 7.40.

that the EC is considering whether digital platforms should contribute to the cost of Europe's telecoms networks. We then set out the benefits of a charging regime in the UK.

Ofcom should recommend legislative changes that allow ISPs and CAPs to negotiate and realise the benefits of two-sided markets without regulatory intervention.

Failing this, we propose a simple solution whereby large CAPs would be obliged to negotiate terms with ISPs. Our proposal would incentivise efficiency, allow the benefits of commercial negotiations, encourage parties to negotiate in good faith, be timely and minimise any regulatory burden.

The EC is considering whether digital platforms should make financial contributions to telecoms networks

We expect the EC to soon consult on whether large digital platforms should contribute to the costs of Europe's telecoms networks. Ahead of this, BEREC published a preliminary assessment[50] finding no evidence that charging is justified, but this assessment does not seem robust:

- **It focuses on the issue of cost-causation** – rather than the need to balance demand on both sides of a two-sided market.
- **It incorrectly finds no market failure** – CAPs impose negative externalities by not always considering their impact on ISPs.
- **It believes a lack of disputes suggests no need for intervention** – there are no disputes because ISPs cannot dispute anything: they must treat all traffic equally and not charge.
- **It incorrectly finds no evidence of free-riding** – CAPs free-ride as they do not pay ISPs for their required investments.
- **It incorrectly finds ISPs have coped with increasing traffic** – as explained in Section 2, UK mobile networks have been particularly impacted by congestion. The report fails to consider how superior connectivity could be under a charging regime.

[50] https://www.berec.europa.eu/system/files/2022-10/BEREC%20BoR%20%2822%29%20137%20BEREC_preliminary-assessment-payments-CAPs-to-ISPs_0.pdf

- **It overlooks the fact that CAPs can make decisions without considering the impact on ISPs** – as a result they are not correctly incentivised to deliver their traffic efficiently.

- **It claims ISPs can monetise increasing traffic** – ignoring the huge growth in data while mobile ARPUs are in long-term decline.

The benefits of a charging regime

Ofcom accepts there could be benefits to a charging regime, including improving CAPs' efficiency incentives.

Ofcom argues, however that: i) it has not seen sufficient evidence that charging would improve outcomes; ii) CAPs are already improving efficiency and the scope for further improvements is unclear; iii) CAPs have several concerns with a charging regime; iv) Ofcom's other proposals mitigate several issues identified by ISPs; and v) there are challenges in designing an effective scheme.[51] Below, we provide our view in each of these five areas.

A charging regime would significantly improve consumer outcomes and incentivise CAPs to use ISPs' networks efficiently

Ofcom accepts the current rules could undermine well-run, efficient, and robust networks if they encouraged CAPs to use networks inefficiently.

A charging regime can be designed to encourage CAPs to make more efficient use of networks, for instance incentivising CAPs to release content outside peak hours or make greater use of more efficient methods of distribution (for instance, wasted bandwidth or deploying a CDN which reduces the need for additional capacity in the ISP network).

Currently, all ISPs' consumers pay for the network upgrades to deliver CAPs' traffic, regardless of whether they value such content or are vulnerable. A charging regime would allow the internet to properly function as a two-sided market, potentially leading to more efficient prices and investment on both sides of the market.

Further, a charging regime could reduce retail mobile prices because MNOs would have stronger incentives to compete for broadband customers. We believe the overall impact on consumers would be positive because MNOs face intense retail competition[52], while the largest

[51] Consultation, paragraph 7.61
[52] Ofcom's MSR finds the retail broadband market to be competitive. ISPs average operating profit in 2021 was 4%. MNOs' churn averaged 27% from 2014-21 and switching increased to 16% in 2020.

CAPs have market power in their respective markets (so can absorb part of any cost increases)[53]and are increasingly ad-funded, reducing the likelihood of them increasing retail prices. [54]

We agree that if CAPs faced incremental charges for delivering their traffic, they would face stronger incentives to improve efficiency, reducing congestion for all customers. In addition, payments received by ISPs could be used to improve peak network capacity.

Further, a charging regime would allow ISPs to earn additional revenues as a direct result of increasing traffic from CAPs, which may result in potential investments becoming economic.

Ofcom has placed too much weight on CAPs' concerns

Ofcom lists CAPs' concerns with a charging regime, namely that it could:

- Result in discrimination, harming smaller or non-commercial CAPs – we propose that only CAPs contributing to at least 5% of an ISP's busy-hour traffic would be in scope. CAPs may receive different terms, but this would not necessarily be discriminatory;

- Limit CAPs' funds available for investment and innovation – but charging would encourage CAPs to consider their impact on ISPs, resulting in more efficient outcomes.

- Entrench or widen the gap between the smallest and largest CAPs – for Three, it appears all CAPs meeting the 5% threshold are of large scale with content that consumers value highly.[55]

- Encourage ISPs to decrease network capacity to increase the prices they could charge CAPs – this is against ISPs' interests, as they compete on network quality (which industry bodies report on).

Ofcom's other proposals do not address the key issue

Ofcom says its other proposals should help ISPs recover their costs and mitigate several issues. However, they do not address the key issue of CAPs not considering the wider impacts when deciding how and when to make use of ISPs' networks:

[53] In 2021, CAPs' operating profits were significant: Netflix (21%), Meta (40%), Google (31%), Disney+ (8%). Further, churn in the video-on-demand market was only 15% in 2021.
[54] YouTube and TikTok continue to be free for consumers willing to watch adverts, Netflix and Disney now have cheaper tiers which include adverts and Amazon has launched Freevee which is free for consumers but includes ads.
[55] [✂]

- **Traffic management:** Ofcom accepts there would be "*benefits to allowing a more focused approach to address congestion*", which would require legislative change. We agree – ISPs need to manage individual CAPs to properly incentivise them.

- **Retail differentiation:** Ofcom's proposal ignores the fact that consumers expect to access content when and where they like.

- **Specialised services:** As per Section 4, the proposed guidance will continue to dampen ISPs' incentives to invest, limiting any potential new revenue sources.

Designing an effective charging scheme is simple

Ofcom lists several challenges in implementing a charging regime, including how the regime could be designed, how ISPs could determine the type and origin of traffic, and the amount of regulatory oversight required.

First, we believe the optimal approach is for ISPs and CAPs to negotiate commercially. We agree that a regime would need to be targeted at those CAPs that generate the most traffic – so we propose a 5% threshold.[56]

Second, ISPs must currently treat all traffic equally and so have little reason to invest in identifying the type and origin of traffic. However, Three has been able to identify the CAP for [✂] and believe this could be improved with more investment.[57] CAPs may not use encryption or redirect their traffic as it increases latency.[58]

Lastly, we propose Final Offer Arbitration (FOA) where ISPs and CAPs would be encouraged to negotiate in good faith with no or little regulatory oversight.

We propose a charging model based on regulation which obliges certain CAPS to negotiate with ISPs

[56] This would apply on a network-by-network basis. For example, if a CAP contributed towards 10% of Network A's busy-hour traffic but only 2% towards Network B, it would only be obliged to negotiate terms with Network A. A CAP's contribution to each ISP's busy-hour traffic would be an average over 12 months.
[57] Ofcom recently changed the regulation regarding the Mobile Termination Rates that UK MNOs can charge non-UK operators. One of the barriers to implementation was MNOs' lack of perfect information on the MTRs that they are charged by each non-UK operator. However, because Ofcom had previously regulated MTRs for all calls, MNOs had never had sufficient reason to invest in systems to identify the individual rates they faced from each non-UK operator. Ofcom nonetheless proceeded with its proposed change and allowed industry to resolve the practical issues.
[58] For example, YouTube is one of the largest drivers of traffic on Three's network and may be particularly impacted by higher latency as end-users click through various videos.

As per Section 1, we believe government should remove the requirement for ISPs to treat traffic equally, allowing ISPs and CAPs to negotiate and realise the benefits of two-sided markets without regulatory intervention. Failing this, government should legislate so large CAPs must negotiate terms with ISPs. We are aware of four possible mechanisms, which we describe below:

- **Final Offer Arbitration (FOA):** the regulation would place an obligation on CAPs to negotiate with ISPs a fair and reasonable price for the delivery of traffic. If the parties cannot reach agreement, the regulation would provide for a FOA or similar dispute resolution process where an arbitrator would determine the outcome. This has been used successfully in Australia and the US in other contexts;[59]

- **Negotiation with regulator fallback:** Similar to FOA but the decision maker (if no agreement is reached) is the regulator;

- **Regulated charges:** A regulator sets a single rate that must be paid from all CAPs to ISPs; and

- **Universal service fund:** CAPs pay into a fund (e.g. based on their share of busy-hour traffic) and the regulator allocates the funds to ISPs, likely based on the share of busy-hour traffic they carry.

As per Table 2 below, we believe FOA is the optimal option when assessed against the following five factors:

- **Incentivising efficiency:** By allowing ISPs and CAPs to have bilateral discussions, specific agreements can be made to encourage CAPs to make more efficient use of ISPs' networks.

- **Allow for commercial flexibility:** Each ISP and CAP is likely to have its own specific circumstances, which should be reflected in commercial discussions. Other options such as regulated charges would result in a one-size-fits-all approach, which would not capture these specifics.

- **Provide incentives for parties to negotiate in good faith:** ISPs and CAPs would be incentivised to submit reasonable offers

[59] In Australia, Google and Facebook have made deals with news businesses (estimated to employ over 90% of Australian journalists) without the need for arbitration. In 2009 in the US regarding sports players' salary negotiations, only 3% of FOA filings proceeded to hearings.

because an arbitrator would ultimately choose one party's proposal if no agreement were reached.

- **Be timely:** Ideally, ISPs and CAPs would agree terms without the need for arbitration. We would suggest that the exact period for negotiation (before either party could invoke arbitration) would be a few months at most.

- **Minimise regulatory burden:** As explained above, FOA has been successful in Australia and the US, with only a small number of agreements requiring arbitration. Each of the other three options is likely to be more burdensome, potentially requiring the regulator to set regulated charges or to collect and administer funds as part of a universal service fund.

Table 2: Potential mechanisms for a charging regime

	Incentivise efficiency	Commercial flexibility	Incentives to negotiate	Be timely	Regulatory burden
Final Offer Arbitration	Yes – parties can capture individual circumstances and costs	Yes	Yes	Yes	Low
Negotiation with regulator fallback	No – potential for regulated charges which won't incentivise efficiency	Negotiations may be limited by expected view of regulator	Weaker than under FOA	No – regulator fallback	Medium
Regulated charges	No – single rate for all parties not efficient	No	N/A	No	High
Universal service fund	No – funds may not be targeted lack of peak capacity	No	N/A	No	High

4. Ambiguity of the rules on zero-rating and specialised services risks harming consumers.

Executive summary

Net Neutrality rules risk harming consumers because ambiguity and uncertainty are discouraging ISPs from creating welfare-enhancing zero-rating propositions and investing in developing new specialised services.

Ofcom has attempted to reduce this ambiguity in the consultation by providing updated guidance regarding how it intends to interpret the rules. Although we welcome this, our view is that strong disincentives for ISPs to invest remain.

In this section, we:

- Ask Ofcom to treat 'Type Three' zero rating offers in the same way as other types – only intervening in isolated cases where it has competition concerns.

- Discuss why the specialised services rules dampen ISPs' incentives to invest in such services – absent legislative change, we ask Ofcom to provide more detailed guidance on how it would assess whether future services will be considered 'specialised'.

Net neutrality rules on zero-rating risk harming consumers

Different regulators and courts have interpreted the rules differently, which can be problematic

Net Neutrality rules do not contain specific provisions on zero-rating. Until recently, BEREC and Ofcom interpreted that zero-rating offers are neither prohibited nor permitted ex-ante and need to be assessed on a case-by-case basis. Ofcom currently uses a three-step framework:

- Step 1: Does the offer have the potential to limit and/or exclude end-users' access to certain content/applications?
- Step 2: Does the offer appear to have the ability to influence end-users' exercise of rights?
- Step 3: Does the offer or commercial practice potentially create a situation where end-users' choice may be materially reduced in practice?

The Court of Justice of the European Union (CJEU) previously found that zero-rating was incompatible with Net Neutrality rules[60]. This has

[60] CJEU in surprise judgment: zero rating is illegal under EU law - European Digital Rights (EDRi)

increased regulatory ambiguity and shows how different regulators and courts can reach different conclusions when considering the same issue.

There are currently only a few zero-rating offers (for example, VOXI's social media and video and EE's music and video pass). Ofcom notes that some major mobile providers have stopped offering zero-rated services (e.g. O2's music streaming offer or Three's Go Binge for new users) due to the increasing popularity of unlimited data plans.

Zero-rating offers can improve consumer welfare by allowing:

- Consumers to consume content outside of their data plan – which can particularly benefit price-sensitive users.
- ISPs to differentiate themselves in ways other than price, network performance, and devices.
- ISPs to provide products that better meet the needs of specific types of consumers – increasing the chance of new business models that are more efficient than those currently on the market.[61]

Ofcom has found little cause for concern with zero-rating offers that it would now consider 'Type Three'

Using the three-step framework, Ofcom has previously reviewed various offers that it would now consider Type Three offers and found that end-users' rights were not undermined, internet innovation was not negatively affected and the offers had no material impact on consumer choice:

- **EE and Apple Music:** EE launched an offer in 2017 that included a free six-month subscription to Apple Music as well as zero-rating its content. Ofcom decided not to formally investigate the offer, due to the limited duration and presence of alternative music streaming zero-rating offers in the market. As such, it did not appear that end-users' choice would be materially reduced;[62]
- **EE and BT Sport:** EE customers received a three-month subscription to the BT Sport App. During the three-month period, both live streaming and catch-up access to the app's content was

[61] kd0217687enn.pdf (europa.eu)
[62] ofcom-approach-net-neutrality.pdf

zero-rated. Ofcom decided not to take any further action because this offer did not materially affect consumer choice;[63]

- **Sky Watch:** Customers of Sky Mobile with Sky TV packages could use Sky apps on a zero-rated basis. Apps that do not require a subscription, such as Sky News, are zero-rated for all Sky Mobile customers. Given Sky Mobile's very small market share and that over two thirds of the time people are connected to WiFi,[64] Ofcom decided not to take any further formal action[65]. Ofcom did not consider that the offer had a material effect; and that the end-users' rights was not undermined.

- **Three's Go Binge:** Three launched Go Binge in 2017, which zero-rated certain music and video streaming services. Ofcom considered Three's relatively small market share, the fact Go Binge is an open platform, and the presence of similar alternative offers as factors when concluding that no further investigation was necessary.[66]

Ofcom should recommend the repeal of Net Neutrality rules on zero-rating and only intervene ex-post if harm occurs

We agree with Ofcom's proposal to unambiguously allow all 'Type One and 'Type Two' zero-rated offers. However, Ofcom's proposed approach regarding 'Type Three' offers creates the risk that zero-rating offers that are good for consumers do not come to market. This is because ISPs must consider the risk of investigation and enforcement, creating uncertainty and undermining incentives for ISPs to make these offers.

A more fundamental reform is needed as set out in Section 1, namely for government to repeal the Net Neutrality rules (including on zero-rating). However, in the interim, Ofcom should adopt the same approach for 'Type Three' offers as for Types One and Two because:

- **Ofcom has previously found no material concerns with 'Type Three' offers:** Ofcom previously reviewed zero-rating offers that it would now consider 'Type Three' and found that further investigation or enforcement was not necessary, even when the largest MNO zero-rated its own content (EE zero-rating the BT Sport app).

[63] Monitoring compliance with the EU Open Internet Regulation (ofcom.org.uk)
[64] Mobile matters (ofcom.org.uk)
[65] Monitoring compliance with the EU Open Internet Regulation (ofcom.org.uk)
[66] Monitoring compliance with the EU Net Neutrality regulation - A report to the European Commission (ofcom.org.uk)

- **Such offers cater to consumer demand:** for example, customers may wish to only have a certain CAP's content zero-rated, without bearing the expense of purchasing an unlimited data plan;

- **Zero-rating can facilitate entry and growth in the content market:** Oxera found that "*zero rating could also bring significant benefits to content platforms that need to reach a critical mass of users (before being able to deliver value)*";[67]

- **Zero-rating certain CAPs can facilitate entry and growth in the internet market:** A potential ISP entrant could zero-rate certain CAPs if it considered there to be consumer demand; and

- **Data allowances are large and increasing:** As of January 2022, 17% of mobile customers had unlimited data allowances, and we expect this trend to continue.[68] Further, in 2022, 80% of users with a data cap used less than half their monthly allowance and only 8% used more than 90%.[69] As Ofcom says, this makes it less likely that zero-rating offers will influence consumers' choice of CAP.[70]

Net neutrality rules limit ISPs' ability to provide innovative specialised services

Net neutrality rules risk undermining ISPs' incentives to invest in specialised services

The current net neutrality rules allow ISPs to offer specialised services only under very strict conditions, where:[71]

- Optimisation is necessary to meet requirements of a specific level of quality;
- The services are not usable or offered as a replacement for internet access services (IAS);
- The network capacity is sufficient to provide these services in addition to any IAS offered; and
- They are not detrimental to the availability or general quality of IAS for end users.

[67] Zero-rating_1-1.pdf-1.pdf (oxera.com)
[68] Consultation, paragraph 5.12.
[69] Consultation, paragraph 5.13.
[70] Consultation, paragraph 5.66.
[71] https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:02015R2120-20181220&from=EN Article 3(5).

If an NRA determines that a service meets these conditions, the service is not subject to other net neutrality laws, such as restrictions on traffic management.

However, ambiguity over the interpretation of these rules means that it can be extremely difficult for an ISP to predict whether a service they are developing will be treated as specialised or not.

In the rest of this subsection, we first demonstrate how this ambiguity can dampen investment incentives, leading to poor consumer outcomes; and then discuss how this can be prevented by i) repealing the specialised services rules and ii) providing more certainty about interpretation of the existing rules in the interim.

Ambiguity in the specialised services rules risk dampening investment

Today we know what some specialised services might be. For example:

- Linear broadcasting IPTV services with specific quality requirements.
- Network slicing enabling MNOs to offer retail customers internet services with bespoke, improved quality levels.[72]
- Fully automated vehicles and remote surgery enabled by networks which offer ultra-low latency and high bandwidth services.[73]

We agree with Ofcom[74] that there are also many potentially important specialised services yet to be developed. These will be enabled by future technological advancements, such as 5G standalone and multi access edge computing.

It is naturally impossible to predict what some future services may be. We do know that some in development today (such as remote surgery and automated vehicles) will likely prove transformative for consumers and businesses.[75] Our reasonable expectation is that future specialised services will offer similar or even greater consumer benefits.

However, there is no guarantee that future welfare-enhancing specialised services will be delivered.

[72] For example, very low latency slices which enable much better gaming performance than internet access services.
[73] https://www.ericsson.com/en/blog/2021/11/five-things-you-need-to-know-about-connected-autonomous-vehicles
[74] Consultation, paragraph 8.10.
[75] For example, autonomous vehicles will be safer and more time-efficient than traditional cars. https://www.economist.com/leaders/2018/03/01/self-driving-cars-offer-huge-benefits-but-have-a-dark-side?utm_medium=cpc.adword.pd&utm_source=google&ppccampaignID=18156330227&ppcadID=&utm_campaign=a.22brand_pmax&utm_content=conversion.direct-

Many specialised services will require large investments in time and resource before they are ready to roll out to consumers.[76] It would be naïve to assume that such substantial investments in these services would all occur regardless of the regulatory framework.

The current framework does not support innovation. The ambiguity of the specialised services rules means that they can be interpreted in a number of different ways. The three main examples of this are:

1. The rules require that specialised services are optimised for specific content, applications or services, where that optimisation is necessary to meet its requirements. However, the question of optimisation is not binary. Most internet services require some kind of minimum service quality. It is unclear what the threshold for optimisation to classify a service as 'specialised' is.

   The classic example here is the distinction between linear IPTV and streaming services provided by video on demand (VoD). These two applications share many common characteristics, are widely considered by consumers to be substitutes and are regularly offered by CAPs on the same platform.[77] Whereas IPTV is considered to be a specialised service, VoD is generally not, due to it requiring less optimisation. However, VoD applications still have specific quality of service requirements[78] which, if allowed, could feasibly be provided over a specialised network to enhance consumers' viewing experience (i.e. to avoid buffering and loss of picture quality).

2. How the categorisation of specialised services changes over time. We recognise that the quality of IAS will continue to increase over time with new technologies. As the definition of specialised services is tied to the characteristics of IAS, there is a risk that it may also evolve over time, unexpectedly removing the categorisation of some specialised services. This is something that BEREC has previously noted:

   'The internet and the nature of IAS will evolve over time. A service that is deemed to be a specialised service today may not necessarily qualify as a specialised service in the future

[76] For example, McKinsey that $120bn was invested in autonomous vehicles between 2017 and 2019 https://www.mckinsey.com/~/media/McKinsey/Industries/Automotive%20and%20Assembly/Our%20Insights/The%20future%20of%20mobility%20is%20at%20our%20doorstep/The-future-of-mobility-is-at-our-doorstep.ashx
[77] For example, BBC iPlayer offers both catch-up and live TV options.
[78] For example, YouTube requires a 'sustained speed' of 20Mbps to play videos in 4K, 5Mbps for HD 1080p and 2.5Mbps for HD 720p. See https://support.google.com/youtube/answer/78358?hl=en-GB.

due to the fact that the optimisation of the service may not be objectively necessary, as the general standard of IAS may have improved'[79]

3. The rules also require that specialised services can only be provided where the network capacity is sufficient and that specialised services are not to the detriment or general quality of IAS for end-users.

   A strict interpretation of this requirement could ban all specialised services on the basis that network capacity is often a zero-sum game – reserving capacity for a specialised service will potentially remove capacity for IAS, to the detriment of IAS service quality. A looser interpretation would only raise concerns if a certain minimum quality standard was not met. In the absence of any clarification, ISPs will be required to second-guess how strictly an NRA will interpret this requirement.

The result of this ambiguity is that in some cases, an ISP will have no idea how the national regulator will interpret the rules in relation to future specialised services. If the uncertainty remains, ISPs will simply not take the risk of investing in developing some future services if they are dependent on the NRA making a subjective judgement that they are specialised. In these cases, the consumer benefits derived from them will not be realised.[80]

There remains considerable uncertainty about how Ofcom will assess future specialised services under the current rules

The cleanest way to overcome the ambiguity in the specialised services rules is to repeal them. As we discuss in Section 1, a system which gives ISPs the freedom to develop commercial propositions without requiring permission from the NRA or being unsure about whether they will be

[79] https://www.berec.europa.eu/sites/default/files/files/document_register_store/2022/6/BoR_%2822%29_81_Update_to_the_BEREC_Guidelines_on_the_Implementation_of_the_Open_Internet_Regulation.pdf paragraph 112.

[80] Austria provides an example of how this ambiguity can result in NRAs requiring services to be removed that an ISP previously considered 'specialised'. In 2017, the RTR requested A1 Telekom to remove a video application which reserved bandwidth for a bundled VoD and IPTV service on the basis that the VoD element was not a specialised service. This decision was upheld by the Austrian Court of Appeal in 2020. See https://www.rtr.at/TKP/aktuelles/publikationen/publikationen/RTRNetNeutralityReport_2020.pdf page 26.

approved will surely be preferable. Ex post interventions could then be relied upon to solve any (unlikely) anticompetitive behaviour.[81]

While the net neutrality rules remain, Ofcom also has a crucial role in ensuring that their interpretation does not stand in the way of welfare-enhancing innovation. It has attempted to reduce uncertainty regarding the rules in the Consultation by providing guidance relating to how it proposes to assess specialised services in the future. [82]

While this attempt is welcome, there remains considerable ambiguity about how Ofcom would assess specialised services. In this response, we describe how Ofcom has proposed to tackle each of the three concerns we set out above and our views on what further can be done:

- Firstly, regarding which services qualify as IAS or specialised services today.
- Secondly, the extent to which Ofcom will change the categorisation of specialised services in the future; and
- Thirdly, the impact of specialised services on the general quality of IAS.

Under each of our concerns we reluctantly ask Ofcom to provide more detail on its guidance to provide greater investment certainty. We see the need for additional intrusive regulation as a 'necessary evil' given the ambiguity of the current rules which could be avoided with repeal.

The definition of specialised services

We agree that specialised services will require optimised quality requirements. However, as we discuss above, the question of optimisation is not binary, and this provides uncertainty about which services require sufficient optimisation for them to be treated as specialised.

Ofcom proposes to lessen the uncertainty about the extent to which a service will require optimisation by asking ISPs for evidence of:

> *'Quality requirements which necessitate optimisation...cannot be met consistently by the ISP's internet access services during normal operation (e.g. when the network is not congested). This*

[81] In the absence of ex ante specialised services rules, we would expect strong retail competition between ISPs to maintain the integrity of IAS (the fundamental concern that specialised services rules are trying to solve). Any ISP which, intentionally or unintentionally, undermined the quality of IAS through the provision of specialised services would expect to lose customers in its main market to ISPs which retained their network quality.
[82] Annex 5, paragraphs A5.76-A5.101.

could be done by identifying the parameters which are not supported by internet access and the impact on the service if it is not optimised (that is, the service features which would not be able to function if delivered via a general internet access service).'[83]

Ofcom also proposes that ISPs should be able to *'demonstrate a reasonable expectation of the need for optimisation'*.[84]

Our view is that the proposed guidance retains substantial ambiguity from:

1. Uncertainty about how to assess the quality that IAS can provide during 'normal operation'. Quality on mobile networks differs by area, time of day and operator, depending on the technical solutions deployed by the MNO (e.g. which spectrum bands, antenna etc.) and the number of customers on the network in a given area at any given time. Ofcom's view of quality during 'normal operation' is, therefore, likely to differ considerably for each MNO.

   Furthermore, under Ofcom's proposed guidance, a service could even be considered specialised for one MNO, but not another with a different network configuration. Presumably this is not an outcome that Ofcom would be comfortable with.

2. Imprecise language such as '*demonstrating a reasonable expectation of the need for optimisation*'. It is unclear how Ofcom will determine whether an expectation of optimisation is reasonable or otherwise.

3. The onus being put on the ISP to demonstrate that a service should be treated as specialised. This approach requires the ISP to guess at the parameters against which Ofcom will be assessing certain services in the future.

Ofcom can go further than this to promote greater certainty. It should provide an ex ante set of quality parameters (e.g. estimated maximum speed, latency, jitter, guaranteed bandwidth) for distinct network segments (e.g. averaged across the network at certain times of day or in

[83] Consultation, paragraph A5.81.
[84] Consultation, paragraph A5.83.

certain areas). Once the requirements of a service exceed these parameters, it should be considered specialised.[85]

Our view is that the requirements of these parameters should be set in line with the average quality of experience that customers receive across an entire mobile network today. This should include areas where sites are congested in the busy hour and service degraded. To do otherwise would overstate the capabilities of IAS and, therefore, leave a grey area where services could not reliably be provided over IAS nor considered specialised.

The assessment of specialised services in the future

Above, we note that the potential for future changes to the definition of specialised services also drives uncertainty. It appears that Ofcom has not considered this dynamic interaction in the Consultation. We ask that Ofcom provides guidance on how it intends to assess the impact of changing network quality on the classification of specialised services, remaining cognisant that an approach which routinely changes the classification will negatively impact investment incentives.

Our suggested approach would be for Ofcom to provide guidance:

- That it will only consider reassessing whether specialised services require optimisation when there has been a material step change in technology (i.e. copper to full fibre broadband) which enables a substantial increase in quality.[86]

- That any future reclassifications of specialised services as IAS would include a long adjustment period (i.e. multiple years) for them to transition away from offering a specialised service. The amount of time should be long enough to allow the ISP to make a reasonable return on the investment in the (previously) specialised services.

The impact on general internet access services

As we discuss above, there is considerable uncertainty about how an NRA will assess whether the requirement not to degrade IAS has been

[85] The 2022 BEREC guidelines indicate that it is building a tool to measure the general quality of IAS (although we are unaware whether this has progressed since). Our suggestion here is consistent with BEREC's apparent understanding that a more systematic assessment of IAS quality is necessary to provide greater certainty to ISPs. See https://www.berec.europa.eu/sites/default/files/files/document_register_store/2022/6/BoR_%2822%29_81_Update_to_the_BEREC_Guidelines_on_the_Implementation_of_the_Open_Internet_Regulation.pdf paragraph 121a.

[86] This is consistent with BEREC's guidance that NRAs are not expected to keep specialised services under constant review.

breached. Ofcom's proposed approach is to consider a specialised service detrimental to the availability or general quality of IAS if:

1. It causes the quality to fall below the applicable contractual quality standards for the service; or

2. In the absence of contractual quality standards, it causes the quality to degrade significantly, as measured by standard quality parameters such as bandwidth, latency, jitter, packet loss and congestion.[87]

MNOs tend not to offer contractual quality standards given the various factors which can impact network quality. We, therefore, expect (2) to be more relevant to MNOs and have identified two main issues with the proposed guidance.

Firstly, as we discuss above, it is not clear what the 'quality' of a mobile network is. It follows that it is unclear what benchmark level of 'quality' Ofcom proposes to use to assess the impact of specialised services against. We suggest that Ofcom uses the same parameters to systematically define IAS quality as we discuss above in relation to our first concern.

Secondly, various factors can impact quality of service on a mobile network at any given time. Even if it was possible to get a reliable measure of 'network quality', it is unclear how Ofcom would assess whether a specialised service has directly impacted that measure.

To promote investment incentives, Ofcom should provide more detail on how it plans to isolate the impact of specialised services, such that it can directly apportion a change in IAS quality to them.

[87] Consultation, paragraph A5.91.