Vodafone Response to Ofcom Call for Evidence:

Net Neutrality Review

November 2021

Summary

1. Vodafone is a keen supporter of an open internet, one that is agnostic to content, leaving the end user free to navigate the net as they wish. However, today's Net Neutrality rules need significant reform. They mandate a one size fits all approach, which doesn't reflect the diversity of today's technology and device capabilities. The result is a set of rules that limits the potential of network and service benefits that can be offered to consumers, businesses, and the public sector.

2. Confusion around the interpretation of the rules leads to an overly cautious approach being taken by network providers, with innovation suffering. Clarity is urgently needed to create an environment that is unashamedly pro-innovation, sympathetic to device and user diversity, while providing basic safeguards that enshrine the right of users to access all lawful content.

3. Regulation in the context of Net Neutrality has overreached. It has sought to guard against a problem that has never manifested itself in the UK. The success of competition between retail broadband and mobile providers acts as a natural constraint against any attempts to materially influence the internet experience of consumers. There are no significant co-ownership concerns regarding ISPs and content providers in the UK, negating the need for such restrictive rules.

4. There is also a question of fairness. Today the rules are firmly focused in the wrong place. While intense retail competition prevents network providers acting to influence internet outcomes, the large platforms who dominate the internet sit outside the jurisdiction of Net Neutrality and can consequently favour their own applications and services inside their respective eco-systems and Content Delivery Networks (CDNs). There is no incentive on these eco-systems to use network capacity efficiently, being entirely disconnected from the costs associated with providing access. This imbalance in regulatory approach is not only unjust and unsustainable, it is delivering inferior outcomes for UK consumers. Our firm preference is for a level playing field, one where the rules on network providers are relaxed to align with those of internet platforms and content networks.

5. The current rules act as a barrier to investment in networks by constraining network owners from making a legitimate return on future investment. If the industry is to deliver full 5G and bring wider benefits to the economy and society at large, then it needs to invest at scale. Net Neutrality reform is a key lever that Ofcom can pull to help address this problem.

6. Ofcom has significant room to reform and improve the UK's approach to Net Neutrality in the short term. New updated guidance, offering a simpler, pro-innovation code of practice that seeks to prevent discrimination but allows a safe space for differentiation across a class of service and device types has the potential to be transformational. This approach will allow 5G services to thrive, providing a platform to support truly transformational service innovation, where differentiation is encouraged while discrimination is prohibited.

7. Ultimately, longer-term legislative reform may be needed to ensure the UK's approach to internet rules aren't rendered obsolete, hindering our nation's ability to take its place as an innovation leader. Our research shows that there is broad public support for common sense reforms. While the public support the principle of an open internet, they do not want rules which hinder service innovation and differentiation. Consumers rightly do not view communication providers as a threat to an open internet, rather they are far more alert to the threat posed by large internet platforms, recognising the influence they exert over their internet experience. When simple choices are presented to consumers, they appear to value more tailored services, better matched to their individual needs. Allowing network providers to shape connectivity to suit specific devices, applications, and circumstances, while basic internet safeguards are in place, strikes the correct balance.

8. The best way of achieving this approach may be to adopt a zoned or partitioned approach, with similar devices/services/users types homed to a zone which best suits their internet needs. This would allow the distinctive characteristics of fixed, mobile, and business users to be recognised for the first time. Discrimination within each zone would be prohibited (to prevent similar application or device types being favoured over others within the same zone), while allowing differentiation for each specific zone to better reflect its needs and priorities. The exact structure should be determined by Ofcom, informed by consultation, but the overall aim would be to permit sensible differentiation, without discrimination.

9. As regulators and Governments around the world revisit their respective approaches to Net Neutrality, the UK has a unique opportunity to provide a blueprint for a future global approach to an open internet; one that is dynamic, fair, and pro-innovation. We are privileged to have a competitive retail communications market in the UK and that must be reflected in how we approach this issue. Ofcom has taken an important first step in commencing this review. The UK must be ambitious and use this review as an opportunity to simplify, enhance and empower the connectivity environment for the good of all, allowing the potential of technology to be realised while supporting sustainable investment in the UK's communications infrastructure. There is no reason for any stakeholder to fear such reforms. It is high time regulation caught up with the realities of today's internet and embrace the technology opportunities that lie ahead.

10. This response is split into the follow sections:

    - Part A (p4) –sets Net Neutrality in context, while highlighting the evolving connectivity & technology landscape over the past decade;
    - Part B (p8) – sets out the shortcomings of the current rules & consequences for the market;
    - Part C (p13) – sets out realistic proposals for reform;
    - Part D (p19) – seeks to answer the specific questions posed by Ofcom;
    - Annex 1 details the consumer research undertaken and Annex 2 provides a legal opinion on how matters could be progressed.

A - Introduction

11. Net Neutrality was designed to stop Internet Service Providers (ISPs) from dictating what services their customers access, due to fears that ISPs would impose their choices on their end users. Mechanisms were put in place to stop ISPs commercialising selective services, devices, or applications to keep internet choice free. Indeed, ask any consumer if they value an open internet and they'll answer with an emphatic 'yes'. You may then ask, why bother making any changes to the UK's approach to Net Neutrality?

12. The issue is of course far more complex than the simple representation above would imply. Indeed, for those who oppose reform of Net Neutrality, it suits to keep the narrative in simple terms and not reach behind that first question of valuing an open internet. Nor is it helpful to acknowledge the very significant changes that have occurred in both the UK mobile and broadband markets and in the wider internet since Net Neutrality was first articulated as a concept.

13. Net Neutrality has its origins in the United States. However, a key difference between the US and European regulatory situations is the market structure for internet service providers. European networks tend to have a much wider choice of ISPs, supported by stronger wholesale regulation on incumbent access networks as well as less vertical integration between ISPs and content owners.

14. While the UK's current legislative and regulatory approach was officially introduced in 2016, its design origins are at least a decade older. Conceived at a time when today's internet giants were embryonic, when no one could foresee the formation of the colossal eco-systems that they have become today. A paradigm shift is underway, moving the focus toward regulating digital. This has resulted in regulators around the globe rushing to set up entirely new approaches as they seek to deal with the consequences of the incredible market power projected by these platforms.

15. In contrast, over the same period, the UK's retail broadband market has transitioned into one of the most competitive in Western Europe. In 2020 the UK was ranked 4th out of 29 countries in terms of pricing outcomes[1], with only France, Italy, and Portugal marginally ahead. In contrast, in the USA, despite being one of the most technologically advanced countries on earth, internet connections cost almost twice as much as they do in the UK, reflecting the limited supplier choice many consumers face and the absence of a mature wholesale market for access.

16. In the last decade, the UK broadband and mobile market has not stood still. Ofcom has invested significant effort in the switching process, with around 200,000 fixed consumers switching broadband provider every month and an even greater number of mobile switches occurring. These dynamic retail broadband and mobile markets are about to shift up a gear, when new switching rules come into force in 2023, making it easier for consumers to navigate between any underlying

[1] https://www.cable.co.uk/broadband/pricing/worldwide-comparison/

access network, regardless of technology. This coupled with a considerable amount of investment in FTTP by a range of alternative providers means it is unlikely this intense level of competition and consumer choice will diminish.

17. In light of the range of ISP choices offered to UK consumers and the ever-easier consumer switching process, it is almost impossible to imagine any outcome where even the largest UK ISPs would have the ability to dictate or limit the internet preferences of their customers. If such action were taken, consumers would simply vote with their feet and switch provider. A similar degree of intense retail competition is present in the UK mobile market, with multiple providers (including a long list of MVNOs – some of whom are very large), affording UK consumers a very significant array of provider choice. Switching in mobile is equally easy, with 'text to switch' now embedded, making navigating the market straightforward.

18. If we were starting today with a blank sheet of paper, given the UK's intensely competitive retail ISP backdrop and competition between MNOs, we doubt if today's Net Neutrality rules would ever be introduced. They are unlikely to be justified under any form of regulatory impact assessments. If the market is so competitive and delivering for consumers, with no evidence of retail market power by any retail provider, why would any additional regulation be justified or needed?

19. Perhaps what is more concerning about the focus of Net Neutrality regulation being on ISPs and MNOs is the fact that the large internet platforms who control their own ecosystems and therefore dictate and control the consumers experience within those eco-systems have been completely overlooked in the Net Neutrality debate. While network providers have their hands tied behind their backs by regulation, limiting any freedom of action (and constrained further by the presence of a highly competitive retail market), large internet platforms have been constructing their own hierarchies of preferential access to control the consumer experience within their eco-systems right under the noses of Governments and Regulators. It is unsurprising that they are amongst the biggest champions of a Net Neutrality regime that relegates communication providers into the status of commodity carriers, restricting both the value and innovation they can add.

20. We now face into a situation where the large internet platforms have used Net Neutrality and open access to guide consumers through into their own gated, commercialised ecosystem, leaving consumers at their mercy once inside, with no route back out, thus crushing any prospect of competition in their chosen space. In this context, network providers are mere bystanders, watching powerlessly while cuffed to their regulators. The EU has recognised this unfairness, seeking to address in part through the Digital Markets Act (DMA) and the Digital Services Act (DSA), with CMA's Digital Markets Unit being introduced to address these concerns in the UK.

21. This absurd approach of using regulation to constrain ISPs who are already constrained by competition, while simultaneously ignoring the negative practices of large internet platforms who stage-manage consumer preferences and experiences within their own eco systems for commercial gain is not only unjust, it harms the ability of ISPs and MNOs to compete fairly and has had far

reaching consequence for future service development. The suppression of ISPs and MNOs has acted to bolster internet platform eco-system market power. This leads to a market where consumers exercise considerable choice over who their MNO/ISP should be, allowing them to experience the internet without influence at least until the curtilage of large internet platform ecosystems, only to find their internet experience manipulated by large internet platforms from that point forward.

22. Indeed, the curtilage of those eco-systems is being pushed ever further [redacted]

23. Likewise, large CDNs or Wholesale Web hosting clouds, through their infrastructure configuration, exercise a great deal of control over the internet experience of end users, yet these activities sit entirely outside the scope of the current rules.

24. Critics may argue that if competition constrains ISPs and MNOs so effectively, then it must be the case that Net Neutrality rules add no additional burden on those ISPs/MNOs, so why reform the rules? Again, this simplistic narrative fails to appreciate both the ongoing harm and the unfairness that is occurring due to the current rules, through the failure to offer a level playing field.

25. Ofcom should be in no doubt that harm is occurring. Consumers are losing out. They are denied the opportunity to benefit from a range of common-sense outcomes that ISPs and mobile providers would like to pursue, introducing service innovations and tariff developments that are better suited to their individual needs. Put simply, the status quo isn't working on a broad number of fronts and reform is vital if the UK is to see service innovation and the network and technology investment that it needs to stay ahead.

26. It is clear that:

    a. The current approach is out of date as it fails to recognise the differing needs of consumers or distinguish between devices and technology;

    b. It creates a material competition imbalance, with a lack of a level playing field;

    c. New guidance is urgently needed to improve clarity and create a more permissive, pro-innovation approach that prevents discrimination while encouraging differentiation.

    d. Ofcom's enforcement priorities need to be clear, with the hurdle for intervention set high.

e. Ofcom's reforms should ultimately build towards legislative change, with Ofcom taking an active role, setting out recommendations to Government for further reforms.

B - The shortcomings of the current rules

Ambiguity - confusion acting to deter innovation & service development

27. On a practical level, interpreting the existing rules can often be problematic, with different stakeholders reaching different conclusions over how the rules should be applied. Not everything can be shoehorned into the specialised service class and there are applications / devices that perform a specific role across the public internet. The recent ECJ judgement on zero rating demonstrates very effectively the different conclusions that different regulators/courts can reach when asked the same question and when referring to a common rule book. Indeed, even lawyers, policy makers and enforcement teams within the same regulator have been known to disagree with each other. This continued uncertainty is harmful and creates unnecessary caution when new services are considered. Without certainty, companies will not invest in new products or services over fear of future regulatory disapproval. If regulators can't agree on interpretation, how can Communication Providers second guess what conclusion would be reached over a new service?

28. Securing approval in advance is neither practical nor sensible in a competitive industry that seeks to push service innovation. There is an overriding need for clarity, accompanied by a change in the approach to enforcement that is more permissive, providing a more encouraging space for innovation and service development, where the burden for any intervention is set high.

Inflexibility - harming consumers outcomes

29. The current rules are inflexible and unable to adapt to changes in technology or circumstances, (unless they are actively ignored). During the pandemic, there was pressure on network providers to zero rate educational content while children were confined to home learning and to access Government and Health care websites to improve information dissemination. These actions were hampered by Net Neutrality rules, with selective zero rating conducted with both the consent and endorsement of both Ofcom and Government. In such circumstances it would not be in the public interest to pursue enforcement action (if considered a rule breach) as the providers involved behaved entirely properly, acting squarely in the public interest and in so doing, stepping up to support consumers in challenging circumstances.

30. Rule inflexibility has caused Ofcom and Government challenges with the introduction of Initiatives that are entirely to the customer's benefit. As an example, the Government had to intervene in 2017 with the Digital Economy Act to introduce legislation specifically allowing the blocking of illegal content for child protection reasons in order to avoid the work of the Internet Watch Foundation falling foul of Net Neutrality regulation. Further, in the recent statement introducing Emergency Video Relay from June 2022 Ofcom has exercised regulatory discretion to "consider that access to emergency video relay should take priority [over Net Neutrality rules requiring zero rated data traffic to stop upon exhaustion of the data bundle] and, if IAS providers do make emergency video relay available in these circumstances, this is unlikely to be something Ofcom would object to on policy

grounds". It is nonsensical to potentially cut-off emergency calls mid-flow and it should not require Ofcom exercising regulatory discretion for industry to be able to deliver such critical communications.

31. [redacted] complicates matters further, making it impossible to apply zero-rated data for Emergency Video Relay calls and instead making such calls chargeable. Again, this raises the spectre of calls being disconnected and again Communications Providers must rely on regulatory detail in GCC5.12(b) and "technical feasibility" in order not to breach current Net Neutrality rules

32. These examples clearly illustrate that Net Neutrality regulations often leads to conclusions that defy common sense. While we appreciate Ofcom may have discretion over when to take enforcement action, that is no substitute for a set of rules that are robust enough to offer the flexibility needed to deliver common sense outcomes across a broad range of circumstances.

Unfair application of the rules

33. With the rules imposed only on network providers, the scope of the regulations fails to influence the very large internet eco-systems that play the most significant role in determining the user experience. A small number internet platforms account for more than 70% of internet traffic. Consumers are aware of the role these platforms play, with most consumers identifying large internet players as having the most significant influence on their internet experience[2]. Once inside these ecosystems, the user is at the mercy of the internet platform controlling it. This also extends to CDNs whose operations can greatly influence the overall content experience.

34. CDNs have thrived in recent years. They are a technically sensible arrangement to move content to servers located geographically closer to broadband users. Typically, CDNs operate and maintain these servers, with CDNs charging content provider for hosting, allowing their content to located close to the "last-mile" for internet service provider. The quality of the experience is often improved when content is accessed in this way. However, the role of CDNs sits outside the scope of Net Neutrality, yet their influence over the user experience is significant. Under the current rules it would be impossible for a communications provider, despite having no market power in this segment, to establish their own commercial CDN (unless it was confined by the scope of a specialised service). This prohibition, however unintended, illustrates the constraints on network providers and the lack of a level playing field.

35. The differential in service quality that can be offered by CDNs compels many content owners to make use of them, however it seems absurd that ISPs and MNOs have their network arrangements governed by Net Neutrality, yet CDNs and large internet eco-systems do not. The same situation has developed in the wholesale hosting space, driving the use of large hosting/cloud platforms, with material stored away from these platforms at a disadvantage to that hosted by large wholesale web

[2] See Annex 1 Question 4

services providers. From a practical point of view, we support the work undertaken by CDNs and large web hosting businesses, recognising the significant role they play in making the internet function effectively. However, it is unfair to have rules only applied to communication networks. Our firm preference is for a level playing field to be created, with the rules on ISPs and MNOs relaxed and aligned with that of internet platforms, wholesale web hosts and CDNs.

Unsustainable economics around network investment

36. The current Net Neutrality rules are paving the way for a long-term funding crisis in network investment. The funds available for future network investment are not unlimited, and it would be reckless to assume that network capacity is infinite, and the only remedy to network congestion would be an endless expansion of network capacity funded by communication providers (and ultimately consumers, whether or not they're users of high bandwidth services). This arrangement, where internet platforms and content providers have unconditional rights in perpetuity to distribute their ever-larger content streams over communication networks, without any regard for the costs incurred is both inefficient and irresponsible.

37. Today there are no incentives on big content providers to distribute their content efficiently. Communication providers are fighting a constant battle to reinforce their core networks to meet ever higher spikes in peak demand, made more acute by one off events, such as live sport and major games updates/releases. The long term economics to support this ever-enhancing capacity does not exist for communication providers, nor is it fair on the average consumer, as they end up paying more to support the transmission of content consumed by a tiny minority of very high users. In mobile, the problems are even more acute, given the finite capacity of radio spectrum. The scale of the problem is being recognised in other countries, with South Korea and Italy both providing recent examples where funding models are being adapted to support network investment for the first time.

Inability to adapt to Technology

38. The rules are simply not flexible enough to cope with today's level of service innovation. They were never designed to accommodate new and evolving technologies, such as 5G and this severely limits what services can be developed. 5G slicing will be incredibly useful to many applications, allowing the potential of 5G to be realised, yet Net Neutrality has the potential to stifle what is possible in this area.

39. Take for example the role that LTE routers could play in the mix of technology to deliver broadband in locations where the fixed network can't be upgraded. The business case for doing this is built incrementally on the back of conventional mobile coverage. In circumstances where LTE routers threaten the quality of mobile services in an area (given the fact that LTE routers can consume a large amount of capacity on the network), if these routers can't be effectively managed due to fear or breaching Net Neutrality and there is a persistent threat that their existence will unduly stress the

network during periods of peak demand, then they will be deemed incompatible with mobile services and therefore fixed wireless broadband services in these areas will not be launched. As a result, consumers in these locations will miss out on gaining access to highly effective broadband service.

Failure to adapt to different user needs

40. Likewise, businesses and consumers often have very different needs from the network. These different needs can't be accommodated if everything is required to be treated the same, all in the name of open internet. That means services can't be enhanced to ensure the communication experience is shaped to better match the needs of individual user.

41. The rules promote economic unfairness. Light users are left to subsidise heavy bandwidth users, thus denying them access to more affordable tariffs that perhaps could be sold at a lower cost, with a lower QoS rating attached (except for emergency access), making them more affordable to price sensitive consumers. We've already seen some lower price tariffs pulled from the market due to the application of Net Neutrality rules[3]. The move towards unlimited tariffs in mobile has, despite a warm reception by consumers, exacerbated the problem. Unlimited packages are increasingly coming under strain, as data SIMs are being used for purposes they were not intended for, resulting in a minority of users consuming massive amounts of bandwidth and compromising the network.

42. Given the finite nature of radio spectrum, this is a real problem, with Net Neutrality rules allowing the problem in the first place, causing prices to rise as these heavy users are subsidised by the majority and putting the sustainability of unlimited packages at risk in the longer term.

Failure to recognise device diversity

43. The principle of treating all devices equally may sound egalitarian and fair, but there is an ever-growing range of devices on offer (from smartphones, LTE routers through to numerous types of IoT) with very different needs and capabilities. Net Neutrality seeks to treat every device in the same way (or else require the network to a secure special service exemption every time there is a need to achieve something different). This is limiting consumer choice and preventing innovation and creating completely irrational outcomes. Why would a regulatory regime seek to deliver 8k video to a mobile handset, when it is beyond the capability of the human eye to distinguish it? Why launch a niche device to target one problem or offer one solution, when open internet rules mean it can't be managed in a cost-effective way? The inability to distinguish different classes of device, acts to deny consumers innovations before they have even been launched.

Food for Thought

44. Imagine a buffet style food court where Team A are allocated responsibility for supplying the food at the counter. Team B charges for the plates that consumers use and determine the number of trips

[3] THREE's original Essential Plans were removed from the market due to the modifications required in the name of Net Neutrality compliance.

to the food counter each consumer will make. Every few months the plates sizes get bigger and the number of trips to the food counter edges upwards, all the while Team A must continue to keep the buffet stocked to meet demand, while retaining the same one size fits all you can eat menu price (a range of different sized serving spoons at the counter denote the various speeds at which plates can be loaded - with flat pricing for each spoon size).[4] The price of plates is of course rising, with options to pay more and upgrade to even bigger plates, however none of this money ever finds its way into Team A's food budget, even though larger plates means more food is being consumed.

45. With a mix of extra-large plates, medium and small plates in circulation (priced differentially by the Team B), it is not only Team A running the food counter that is being exploited, the smaller plate consumers are unwittingly subsidising those with the largest plates as everyone must be charged the same price at the food counter, allowing a few heavy users to drive up the food counter price. Eventually the price of restocking the buffet becomes unstainable.

46. The situation would be even worse if the food available in the warehouse was constrained (reflecting the finite capacity of radio spectrum) and in some peak periods there would be a risk that with too much demand arriving at once (during the lunchtime rush), the food would be insufficient to meet demand, meaning some consumers would go hungry (particularly if a series of big plates are at the front of the queue). In this situation, the rules prevent Team A from stepping in and using common sense to introduce sensible apportionment so that no one goes hungry[5].

47. At no point are Team A ever dictating to consumers what they can select from the counter. Consumers remain free to make their own menu choices (indeed there are several different food counters to choose from). The main beneficiaries from this system are the plate suppliers, Team B. The result is a chronic failure to invest in the food counter, which ultimately diminishes the quality of that can be offered to consumers.

48. This may be a simplification, and it does not attempt to explore the added complications of the existence of large internet eco systems influencing the consumer experience, but it does provide a representation of the lack of sustainability and fairness in the current approach.

[4] Not forgetting strict rules around auto-compensation and the risk of triggering a right to leave if prices rise above a certain level, as well as other consumer regulation that constrains what commercial propositions can be launched by Team A.

[5] In reality, the rules dictate that all the customers be denied an equal % of their required plate, even though for some it means they may go hungry, while for others it's merely affecting their 5th visit to the counter.

C - Reforming Net Neutrality

49. Vodafone wants to see the UK's approach to Net Neutrality reformed into a regime that safeguards against internet discrimination, while allowing differentiation, including the ability to legitimately commercialise services to promote innovation and network investment. Freedom to navigate the internet in a manner of your choosing is important, but the rules around this should not stand in the way of innovation and common-sense outcomes. There is a need for level playing field with other market participants (notably large internet platforms and CDNs), something best achieved through the removal of excessive restrictions on network providers.

50. In October 2021 we commissioned YouGov to ask UK consumers a series of questions to gauge attitudes towards some of the concepts outlined in this submission. The aim was to reach behind the first question around the overwhelming support for an open internet and understand what consumers value, how they would choose to deal with certain situations and what outcomes they prefer. There is broad support for sensible reforms that promote more choice and flexibility towards how connectivity is delivered to better reflect the circumstances. Communication providers are not viewed as a threat to internet freedom. Annex 1 provides more details of the results, which we hope Ofcom will find useful as it seeks to understand consumer attitudes to this complex topic.

Streamlining the rules

51. There is a clear need for the rules to be made simpler and the rule book made smaller. We need complete clarity around how the rules are interpreted to promote certainty, with a focus on basic safeguards deigned to keep access to internet content open and agnostic. The default position should be that any innovation or service development outside of this scope should be permitted, with Competition law acting as the primary safeguard of consumer welfare. The industry needs a safe space to innovate and develop services and tariffs that meet the broad range of consumer needs head on. The threshold for enforcement should be kept high, where there is clear evidence of harm through discrimination. A clear statement around enforcement priorities would offer considerable benefit.

Treating Mobile differently to better reflect the underlying technology

52. This means a separate approach for mobile, one that recognises the special characteristics of mobile technology, including the finite nature of spectrum and the future development trajectory of 5G. Network slicing should be encouraged, to ensure different services can be accommodated on different slices and the network dimensioned appropriately for both specific services and the generality of usage.

53. Many of the applications that run on 5G will rely on a guaranteed quality of service for mission critical activities (robotics, V2X services, autonomous convoys, virtual reality for remote assistance). Imposing a control to ensure that these applications require to be harmonised and treated equally greatly compromises what can be offered, introducing unnecessary friction into what can be a completely automated and real time process.

Acknowledging the needs of UK business

54. We need an approach that recognises the need for a different approach to business applications compared to those of consumer services. Business application can often have specific service characteristics and while not enough to meet the criteria of a specialised services, the impact of service failure can be more acute to productive industries and public services, having a real-life economic hit. We need to be able, where appropriate, to prioritise the reliability of business services to ensure services can be delivered all of the time, allowing the economy to grow and helping in levelling up all parts of the United Kingdom through access to dependable connectivity, with business connectivity safeguarded in periods when networks come under stress.

Better matching the network to both device and technology

55. We need an approach that recognises the huge and ever-growing variety of devices available that connect to the network. Treating them all the same doesn't make sense and compromises what services and features that can be offered. There needs to be a series of device classifications (smart phones, LTE routers, Streaming TV/Sticks, PC, Games Consoles, IoT, Telemetry, VR, wearable etc) and a requirement not to discriminate between devices within the categories (ie. one vendor over another), but recognition that the needs of different devices vary and therefore, the connectivity offered should also vary. Smartphones are considerably different from LTE routers or connected cars and there should be nothing in the Net Neutrality rules that prevent the network from responding to those differing needs, shaping connectivity to match the device class.

56. The latest innovations of 5G, Artificial Intelligence and SD-WAN mean that networks are becoming increasingly programmable and controllable on demand. This could open possibilities for applications to request, provision and receive network services on demand in real time, with no need for human intervention, allowing applications to optimise how they perform.

57. This could drive many benefits for end users and enterprises:

    I. Improved user experience through applications that always perform at their best;

    II. Enterprises can benefit from guaranteed quality of service for important applications

when they need it;

III. Reduced risk of service failure as applications can repair faults before they happen;

IV. Less downtime where resources spend time looking for reasons why applications or services are not performing so that businesses can focus on their core business and innovation.

Freedom to deploy 5G Network Slicing

58. Given network slicing is one of the fundamental capabilities of 5G, allowing the technology to showcase what it can achieve, it is concerning that Net Neutrality rules are limiting what can occur in this area. The potential of 5G slicing has been recognised by other regulators. Indeed, as far back as 2010, in the United States, the Federal Communications Commission introduced a ruling exempted mobile networks from most of the Net Neutrality rules, on the grounds that they face stronger capacity constraints than fixed networks, and that competition mitigates any negative effects of a departure from Net Neutrality. Network slicing offers massive benefits, providing an opportunity to maximise the utility of spectrum by offering spare capacity to businesses interested in a guaranteed quality of service on demand, powered by dynamic pricing. Not only is this efficient, but it improves network economics and stimulates investment.

The ability to manage traffic responsibly and protect Quality of Service

59. Mobile providers in particular need to have clear lines of action to maintain quality of service over a range of devices through responsible traffic management. This may mean temporarily throttling some very high users who may or may not be taking advantage of unlimited tariffs, or using bandwidth hungry devices (such as LTE routers) during periods of network congestion (or to prevent congestion occurring in the first place). There should be no ambiguity around a providers' freedom of action to maintain network functionality for the majority of consumers.

What can Ofcom do without a change in legislation?

60. We think Ofcom can achieve a great deal in this review. Ofcom can pursue compliance through co-regulatory means such as an agreed code of conduct that is more permissive to service and end user needs. Ofcom can reinforce this and provide clarity by identify policies for Net Neutrality through a statement of enforcement priorities. Ofcom has significant freedom to interpret the application of non-discrimination. Ofcom also has the freedom to set out a series of recommendations for any future legislative reform to Government, who do have to powers to lay Statutory Instruments before parliament. Ofcom should not be a bystander in this process and must make its final views clear to Government by outlining a series of clear recommendation for

legislative reform.

61. Ofcom can also place an immediate ask on content providers to help address some of the practical problems being experienced today. Content providers should be required to make changes in their behaviour in order to allow networks to be used more efficiently, taking measures to mitigate peak traffic growth. Examples of where content providers could be incentivised to make better choices include:

    I. Greater use of caching and peering solutions;

    II. More sensible timing around software updates/ gaming releases during off-peak times;

    III. More use of multicast delivery for live TV, especially live sports content.

62. Any new code of conduct in this area could require content providers to notify Ofcom and consult with stakeholders on planned changes (such as the introduction of encryption of an service), which may materially impact service delivery, customer billing and drive costs elsewhere in the value chain. Ofcom should have the power to require modifications to new services, to ensure existing services are not disrupted, additional costs are not imposed, and communication provider quality of service is not compromised as a result.

63. An outcome that delivers a sensible code of conduct for both communication providers and content owners is desirable, allowing for clear safeguards to be in place. Setting clear and transparent priorities for Ofcom enforcement also has the potential to be transformational. Annex 2 sets out a legal opinion on considerations around the approach to reform, providing practical steps around what can be done within the scope of this review and how this might build towards future legislative changes.

Enhancing Net Neutrality using a partitioned approach

64. In seeking not to discriminate, Net Neutrality has become discriminatory. Non-discrimination is "equivalent conditions in equivalent circumstances" However, preventing users who wish to pay for enhanced service to get a better experience (e.g. for gaming) is a form of discrimination. It fails to recognise their circumstances are not equivalent to those for whom a lower quality of service and price are acceptable (e.g. email only users). Networks dimensioned above some users' requirements discriminates against those users who pay the price of the over-dimensioned network. This in turn deters or prevents innovation at network level to support different applications

65. One idea worth exploring further in this process would be the possibility of creating a regime to prevent discrimination, while encouraging differentiation by adopting a zoned or partitioned approach leading to an enhanced form of Net Neutrality, where different technical parameters can apply in each zone of use (delineated by user type/device/application), but there would be no effort to discriminate treatment within the zones themselves.

66. For example, there would be a strict prohibition against one video conference application being prioritised over another [redacted] or one device in the same class or zone cannot be treated more favourably than the other [redacted]. However, there should be flexibility to enhance the network experience, allowing different approaches for different device types (LTE Routers could have different parameters applied than smart phones). There would also be nothing to stop the owners of one application paying to enhance the carrier experience for that application, provided identical terms were offered to their rivals and no discrimination was taking place. Network Slicing on 5G would be included, with the ability to offer a specific, optimised slice to one application on commercial terms, provided that commercial option was open to other comparable applications (who could then purchase on similar terms).

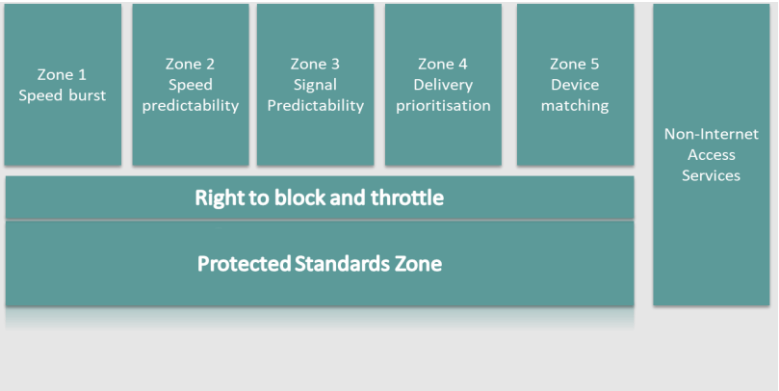
67. Applications could be enhanced through this approach, for example by allowing video conferencing traffic to be prioritised across the network to better meet the needs of users, with the connectivity better shaped to available network technologies and devices. While there may be different prioritisation for different zones, there could be no discrimination for services within the same zone [redacted]. Ofcom could consult on the delineation points and we would anticipate most services would be able to identify which zone applied to them, with Communication Providers able to interpret the criteria and ensure no discrimination. The concept of non-discrimination in UK telecoms has existed successfully for decades and never manifested itself as a particular burden upon Ofcom. Reference offers are published which set out equivalent terms to different purchasers. If such a regime was established, it is unlikely to draw heavily on Ofcom's resources, with the day to day application left to providers.

68. The needs of the end user could also be factored into the zoning, with users who require high priority access (for operational or commercial reasons) placed in one zone and those who want lower cost plans placed in another. At all times access to the emergency services would be exempt for any structured zoning and there would be full transparency around the service plans offered. The entire approach would be content agnostic, with all lawful content accessible and fully useable to all. It would only be during periods of network congestion that the differential between the various zones would identify itself to users.

69. There are numerous potential approaches to the zones/partitioned idea to enhance Net Neutrality

enabling it to have the flexibility to take advantage of the technology /device options and allow consumers to benefit from enhanced services, while creating the correct economic signals around network investment and service innovation.

An Example of a potential 'Zoned' approach to enhancing Net Neutrality



70. This enhanced Net Neutrality approach would fundamentally protect the non-discriminatory character of Net Neutrality. With the network providers prevented from self-preferencing. It would allow networks and service providers to develop enhanced services in line with customer needs and the economics of the network, allowing networks to realise return on investment in advanced network standards. It gives rise to consumer benefit from direct operator service enhancements and indirectly from service provider offerings. It would be accompanied by a transparency requirement to ensure consumer were fully aware of the options, allowing for informed purchasing decisions.

D- Q&A

Question 1: Functioning of the Net Neutrality framework

(a) Which aspects of the current Net Neutrality framework do you consider work well and should be maintained? Please provide details including any supporting evidence and analysis.

The concept of ensuring access to all lawful content is an important one that should be preserved.

(b) Which aspects, if any, of the current Net Neutrality framework do you consider work less well and what impact has this had? What, if any, steps to you think could be taken to address this and what impact could this have? Please provide details including the rule or guidance your response relates to and any supporting evidence or analysis.

The existing rules have serious flaws that ultimately act against the consumer interest. The details are set out in the main body of this submission; however, they can be summarised as follows:

- *Rule Ambiguity - confusion acting to deter innovation & service development;*
- *Rule Inflexibility - harming consumer outcomes;*
- *Unfair application of the rules - a lack of a level playing field;*
- *Unsustainable economics around network investment;*
- *Inability to adapt to technology;*
- *Failure to adapt to different user needs;*
- *Failure to recognise device diversity.*

Question 2: Use cases, technologies, and other market developments

(a) What, if any, specific current or future use cases, technologies or other market developments have raised, or may raise, particular concerns or issues under the Net Neutrality framework?

The latest innovations of 5G, Artificial Intelligence and SD-WAN mean that networks are becoming increasingly programmable and controllable on demand. This could open up possibilities for applications to request, provision and receive network services on demand in real time, with no need for human intervention, allowing applications to optimise how they perform. This could drive many benefits for end users and enterprises.

Many of the applications that run on 5G will rely on a guaranteed quality of service for mission critical

activities (robotics, V2X services, autonomous convoys, virtual reality for remote assistance). A requirement that these applications must be harmonised and treated equally greatly compromises what can be offered, introducing unnecessary friction into what can be a completely automated and real time process.

Network slicing offers massive benefits, providing an opportunity to maximise the utility of spectrum by offering spare capacity to business interested in a guaranteed quality of service on demand powered by dynamic pricing. Not only is this efficient, but it improves network economics and stimulates investment.

(b) What, if any, steps do you think could be taken to address these concerns or issues and what impact could this have? Please provide details of the use case, technology or market development and the rule or guidance your response relates to, as well as any supporting evidence and analysis.

Ofcom needs to make the regime far more permissive and adaptable to different user and technology/device needs. The rules should retrench to focus on internet discrimination (blocking content), while allowing service differentiation, including the ability to legitimately commercialise services to promote innovation and network investment. Freedom to navigate the internet in a manner of your choosing is important, but the rules around this should not stand in the way of innovation and common-sense outcomes.

Question 3: Value chain

Are there particular business models or aspects of the internet or other value chains that you think we should consider as part of our review? Please explain why, providing detail including any supporting evidence or analysis.

There needs to be level playing field. The large internet platforms who control their own ecosystems and therefore dictate and control the consumer experience within those eco-systems have been completely overlooked in the Net Neutrality debate. Please refer to the main body of this submission for further details of these concerns.

Question 4: International cases studies

Are there any international case studies or approaches to Net Neutrality that you think we could usefully consider? Please include details of any analysis or assessments.

While the characteristics of the UK market should be Ofcom's primary focus (the UK's retail broadband market has transitioned into one of the most competitive in the world), International comparisons can be Informative. South Korea and Italy have recently demonstrated that different approaches can be taken to address what is an evolving problem:

- *South Korea Broadband is seeking to recover a share of the costs associated with carrying*

traffic of the largest content providers[6]. Netflix contested this in the courts, however the courts ultimately decided that "Netflix is at least receiving network services, including management of the network quality, at a cost." and it is "It is also reasonable to say that Netflix has the obligation of paying the price for the services to SK Broadband.

- *In Italy, AGCOM has acted ensure that DAZN contributes to network investment needed to distribute live Serie A content[7].*

Question 5: Guidance and approach to compliance and enforcement

Are there specific challenges with the existing guidance that we should be aware of (e.g. ambiguity, gaps)? Assuming the rules stay broadly the same, which areas could Ofcom usefully provide additional clarity or guidance on? Please provide details.

Any future guidance needs to be clearer, more streamlined, and more permissive to development. Enforcement priorities should be clear upfront and there needs to be more detailed understanding of how Ofcom is interpreting the legislation and the concepts set out in within. Non-discrimination can be Interpreted in multiple ways, and it would be helpful to understand Ofcom's approach. Further views around guidance are set out in the main body of this document.

Question 6: Annual report

Do you find Ofcom's annual monitoring report useful or are there any changes you think we could usefully make either to the content or how we communicate this?

We believe the annual monitoring report may have run its course, with no recent investigation work undertaken. Given the competitive nature of the UK's broadband and mobile markets, we are not surprised by this outcome. The process flow material for traffic management and guidance around zero rating within the reports has proven useful, demonstrating the benefits of clearer guidance. It may be the case that the report is replaced with a document that sets out Ofcom's enforcement priorities. It would be sensible to revisit this question towards the end of this review process.

[6] http://www.koreaherald.com/view.php?ud=20210628000798
[7] https://www.punto-informatico.it/agcom-si-tuteli-la-rete-dagli-streaming-dazn/

Annex A

Consumer Research

1. Vodafone asked YouGov to conduct research, asking consumers a series of questions to help gain a better understanding of attitudes towards open internet. The research findings highlighting that while consumers value being free to navigate the net without influence, they are supportive of a range of outcomes that allow providers to act with common sense and support fair play, prioritising where that makes sense to do so.

2. Consumers appear to recognise that different services have different needs and some services are more important than others. There is also a recognition of fairness. If you consume more of something, then you may be expected to pay more. Likewise, consumers appear to value the freedom to select a lower quality product if the price is cheaper.

3. While Net Neutrality rules may seek to preserve the principle of open internet, they remove a considerable number of other choices from consumers without their knowledge. Reforming Net Neutrality provides an opportunity to put consumers back in control, giving them more connectivity options, more innovative services and solutions while safeguarding a content agnostic approach to navigating the internet.

4. When this trade-off is rationally explained to consumers and they are presented a menu of choices around how they might approach their own internet experience and are allowed to prioritise what they value, they embrace the flexibility of a more differentiated and technology tuned market place, turning it to their advantage to improve their circumstances. They also respond with a considerable degree of common sense around the choices of others, appreciate that different people have different needs. 73%[8] of respondents recognised that work applications should take priority over entertainment at least some of the time (when the network is busy) and 89%[9] would support the emergency services having prioritised access to the network should the need arise.

5. Given Quality of Service hierarchies only become effective in periods when the network is stressed and providers compete extensively on the quality of service, any contrast in consumer experiences is likely be both infrequently and fleeting. When conflict does arise, then when armed with the knowledge of why different users / applications may be prioritised, the wider public is very accepting of this concept, understanding the broad spectrum of need. They also expect their broadband provider to manage consumption fairly, with over a third of respondents[10] favouring introducing some kind commercial measures to reflect this. Respondents also expressed a high level of confident around navigating the market and switching provider if they feel dissatisfied with their current broadband provider[11].

6. Consumers are clear that they don't view their mobile or broadband provider as threat to their internet experience, with half of respondents identifying big tech companies as of primary concern[12].

[8] See question 1
[9] See question 2
[10] See question 3
[11] See questions 6 & 10
[12] See question 4

Around 10%[13] of consumers would appear willing to pay extra to get their data prioritised when in a large scale event when the network was congested (such as a stadium event), reflecting similar levels of take up to the fast track security options available at airports. 62%[14] of respondents were supportive of commercial pricing signals to manage usage of mobile networks in busy periods, with options to pay dependent on need favoured by most.

7. There is a clear acceptance of the principle of fairness in consumer responses. In the same way as UK citizen both understood and supported the approach to the Covid-19 vaccine roll out programme being prioritised based on clinical need, they are more than willing to accept that a public sector user serving the public may have a greater need for connectivity than a teenager playing online games[15]. The trade-off between the two is rarely likely to occur, but if it does, then it is important for network providers to be empowered to make common sense decisions on priorities. Our research shows we have the backing of the public for this approach and it is regulation that needs to catch up to better reflect the sentiments, values, and priorities of consumers in respect to the application of Net Neutrality.

[13] See question 5
[14] See question 8
[15] See question 12

YouGov UK Survey Results - Broadband & Streaming

Fieldwork Dates: 14th - 15th October 2021

Q1. For the following question, please imagine you are working from home on a laptop/computer whilst your family/friends are in the next room streaming entertainment content (e.g. YouTube, TV) or playing a video game over the internet (for this question, if you don't work from home, we are still interested in your opinion)...

Do you think your ability to use work applications should take priority over entertainment, in periods when the broadband network is busy?

15% - Yes, at all times

58% - Yes, but only during work hours

16% - No, I don't

11% - Don't know

Q2. For the following question, please imagine you are stuck in a traffic queue caused by an accident ahead on the motorway (For this question, if you don't drive, we are still interested in your opinion)...

To what extent do you agree or disagree with the following statement?

"Emergency services and road management devices (like motorway cameras) should have priority on the mobile network, in order to help them get to the accident site quicker."

59% Strongly agree

30% Tend to agree

3% Tend to disagree

2% Strongly disagree

5% Don't know

Q3. Do you think that a user of the internet who wants to consume more than their neighbours (e.g. for ultra high-definition TV streaming) should pay more for this service, so that the network provider can better support the higher quality of coverage?

35% Yes - people should pay for what they use

44% No - I expect the network to manage consumption fairly

10% No - the content service should pay for the delivery

11% Don't know

Q4. For the following question, by the concept of 'open internet', we mean that information across the World Wide Web should be equally shared and available to all users...

Which ONE, if any, of the following do you think is the biggest threat to the concept of open internet?

50% Big tech companies like Google, Apple and Facebook

7% Your broadband provider

8% Broadcasters and content creators

7% Other [open] please specify

Top answer for 'Other' was Government.

28% Don't know

Q5. For this question, please imagine that you are at a stadium concert and you want to send a video message...

How likely or unlikely would you be to pay a small fee so that your message is sent faster through the congestion?

3% Highly likely

7% Somewhat likely

21% Somewhat unlikely

62% Highly unlikely

6% Don't know

Q6. For the following question, please imagine you found out that your broadband provider had started to slow down or deprioritise your favourite streaming service (i.e. Netflix, Amazon Prime, Spotify etc.)...

Which, if any, of the following actions would you take?

76% I would complain to the network provider, and move to a new provider if it wasn't fixed

7% I would stay with the same provider and put up with it

5% None of these

12% Don't know

Q7. For the following question, by 'content streaming application', we mean any media content delivered by the internet, for example Netflix, Amazon Prime Video, Spotify, YouTube...

If your mobile phone provider were to add one content streaming application into your phone contract, which would allow you to watch this content on your device, do you think that the cost of this service should be taken from your paid-for monthly data allowance?

28% Yes - I would expect using this service means using my data allocation

53% No - as this service is included in my bundle, I would expect data usage to be covered in addition to my allowance

19% Don't know

Q8. Would you like to see more choice on how your mobile provider deals with busy periods on the network with the option to pay more or less based on your needs? (For example, by decreasing costs for those who use less data, and increasing costs for someone working from home with a larger data requirement)

30% Yes, I would like to see more choice - people should only pay for what they use

32% Yes, I would like to see more choice - but I would like the choice to be easily available

20% No, I would not like to see more choice - everyone should pay the same amount regardless of their usage

19% Don't know

Q9. For the following question, by the concept of 'open internet', we mean that information across the World Wide Web should be equally shared and available to all users...

To what extent do you agree or disagree following statement?

"The principle of open internet is important, but it shouldn't stop broadband providers from making choices around what usage to prioritise (e.g. prioritising work video conferencing over gaming)."

6% Strongly agree

34% Tend to agree

21% Tend to disagree

13% Strongly disagree

26% Don't know

Q10. To what extent do you agree or disagree with the following statement?

"There are lots of Broadband providers to choose from. If I don't like mine, I can easily switch to another one."

23% Strongly agree

46% Tend to agree

18% Tend to disagree

4% Strongly disagree

10% Don't know

Q11. To what extent do you agree or disagree with the following statement?

"At busy periods where the service is at risk of being congested, my mobile provider should step in and limit those who are using significantly more data, so that service for everyone else is unaffected."

7% Strongly agree

37% Tend to agree

23% Tend to disagree

10% Strongly disagree

23% Don't know

Q12. To what extent do you agree or disagree with the following statement?

"When the network is being disrupted, public sector workers (e.g. critical national infrastructure suppliers or NHS nurses) should have their communications prioritised over an average user."

25% Strongly agree

42% Tend to agree

13% Tend to disagree

6% Strongly disagree

13% Don't know

Survey Demographics:

Total	Gender		Age					Social Grade		Region							
	Male	Female	18-24	25-34	35-44	45-54	55+	ABC1	C2DE	North	Midlands	East	London	South	England (NET)	Wales	Scotland
2250	1021	1229	92	327	390	378	1063	1352	898	543	363	260	277	498	1941	118	191

Annex 2

Net Neutrality opinion - Towerhouse LLP - October 2021 (see accompanying document).