

NOKIA



The value of 5G services:

Consumer perceptions and the opportunity for CSPs

3,000 consumers reveal the 5G-enabled services they find most appealing

Introduction

When you build it, they will come

That’s been the driving ethos behind the 5G network buildout, but Communication Service Providers (CSPs) need to know what factors will spur adoption, and which – if any – higher-value 5G services will most spark their desire.

To answer these questions, Nokia conducted in-depth research with more than 3,000 consumers in three key geographies where 5G is already deployed: the United States (US), the United Kingdom (UK) and South Korea.

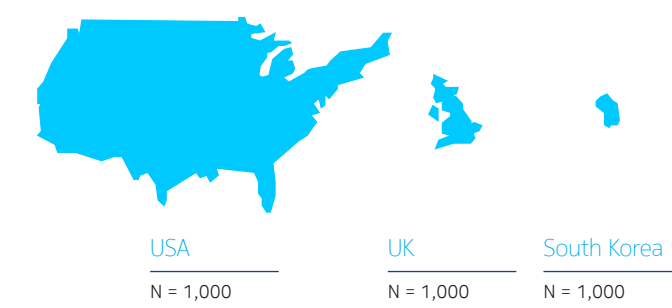
Complementing a parallel survey on industry perceptions of 5G services, this major new study reveals what consumers expect from 5G, which services they most want to receive, and how they’d like to receive them. This report presents a detailed summary of our findings, augmented with qualitative data and insights from four focus group sessions in two US cities.

Throughout, we’ve included key takeaways and advice to help CSPs develop a winning 5G strategy for the consumer market.

A note on COVID-19

This study was completed in January 2020, before the global COVID-19 outbreak. Where relevant, we’ve added commentary about the likely effects of COVID-19.

Who we spoke to
Online survey of 3,000 smartphone users in the US, UK and South Korea



Focus groups in NYC and Dallas, with a total of 30 smartphone users



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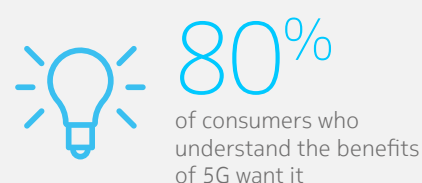
Key findings:

What 3,000 smartphone users told us about 5G



1. Consumers want 5G when they understand it

Demand for 5G enhanced mobile broadband (eMBB) service increases significantly when consumers understand what it is and what it can do for them. We found that 80% of consumers who understand 5G want it, compared with just 23% of those who aren't familiar with it.

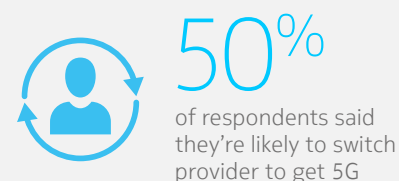


2. Consumers are willing to pay more for 5G

Over half of survey respondents said they'd be willing to pay more for 5G. Focus group participants, however, said they'd look carefully at costs and at different providers' offers. This suggests that cost will be a consideration for adoption but not a barrier to it, and consumers show a willingness to pay more if they understand the 5G difference.

3. Engaged users will switch provider to get 5G

50% of respondents said they're likely to switch provider to get 5G if their own provider doesn't offer it in the next 12 months. Those most likely to switch – remote workers, video streamers, home monitors – are highly-engaged users who will make substantial use of 5G-enhanced capabilities.

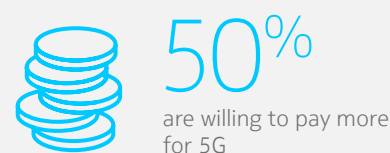


4. 5G FWA and video are the top use cases beyond eMBB

Consumers were attracted to all of the higher-value 5G services we presented, but the ones with the most appeal are Fixed Wireless Access (FWA) as an alternative to wired broadband, and video use cases including high-quality video capture, streaming and calling, as well as video detection with alerts.

5. Opportunities abound for CSPs to expand beyond connectivity

While FWA and eMBB are the top use cases for 5G, our survey revealed a strong appetite for 5G-enhanced services in many areas, from home monitoring and real-time drone video to cloud gaming, AR-based translation, precise navigation, and more.



Mapping 5G awareness and demand



Mapping 5G awareness and demand

5G is making its mark on the world. Consumers inherently know there's value in the next-generation network, and when they understand more about what that value is, they find it highly appealing.

Participants in our survey understand that the technologies of the future – remote medical diagnostics, immersive Virtual Reality (VR), home robots – will need faster, higher-performance networks, and that 5G is a necessary evolution for those technologies to become reality.

However, deeper understanding of 5G is currently lacking. Participants in our focus groups primarily thought of 5G as 'faster 4G', and confessed to knowing little beyond that. Many believed it to be the same thing as 5GHz Wi-Fi, creating confusion around whether they already have it or not. But universally, the consumers we surveyed are keen to learn more about what 5G can do for them.

CSPs have a key role to play in communicating the value of 5G

For CSPs looking for one key takeaway from this study, it's the need for education about the true value that 5G can bring. Our findings show that only 23% of people who are unfamiliar with 5G find it appealing – but that figure rises to 80% among those familiar with the new network.

Crucially, we found that familiarity is higher in areas where 5G is already deployed, suggesting that carriers' marketing campaigns in those areas are cutting through. Further education, including in areas where 5G is not yet available, will prime the wider consumer market for 5G services.

Consumers are willing to pay more for 5G

More education will be an investment worth making, because consumers felt excited about the possibilities once we provided them with information in our surveys and focus groups. Around two-thirds of survey respondents said they'd pay up to 5% more for 5G eMBB, and just over half said they'd even be willing to pay up to 10% more – and this was consistent across all three geographies.

While deeper discussions in the focus groups revealed that consumers would in fact look closely at pricing, and at different plans and bundles, the study as a whole shows widespread understanding that the 5G difference is something worth paying for. The more that CSPs can demonstrate the value of that difference, the easier it will be to command premium pricing for the kinds of 5G services we explore in this study.

Willingness to pay more for 5G

■ Willing to pay 10% more ■ Willing to pay 5% more



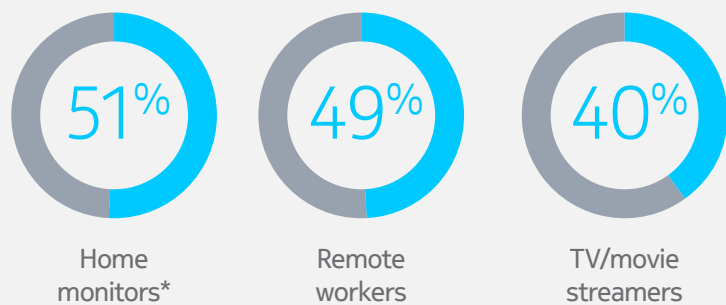


Engaged users will switch provider to get 5G

One key finding is that many consumers are ready now to move to 5G, and are prepared to switch provider if their own doesn't start offering it in the next 12 months. Around half of the smartphone users we surveyed said they were likely or highly likely to switch in this way, with the highest proportions (53%) in the US.

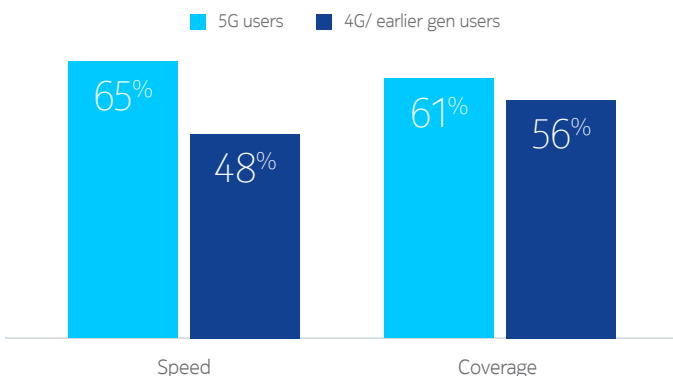
Those most likely to switch are highly-engaged smartphone users, who use their phones for high-value activities like video streaming, home monitoring and remote videoconferencing. CSPs that roll out their 5G networks early – and who are able to identify and target these users effectively – will be able to capture these high-lifetime-value customers

Very likely to switch for 5G



* those who say they monitor their homes, children, pets, or other property from their smartphones.

High satisfaction: 5G vs 4G



For engaged users, position 5G as an enabler of higher-value services

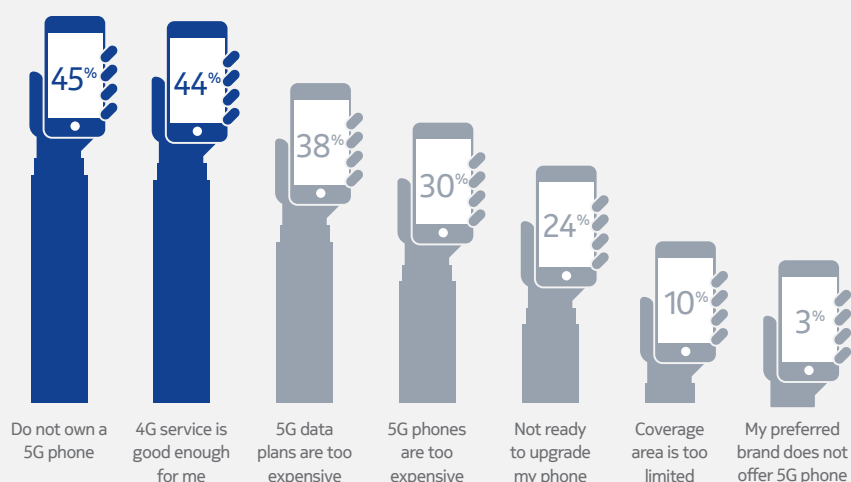
Consumers who find 5G most appealing tell us they are satisfied with their current service, consider themselves early adopters of technology and engage in online activities that require strong network performance.

So rather than focusing on the limitations of 4G for engaged users, the findings suggest it will be more effective to focus on the additional value that 5G can bring – by emphasizing it as an enhancer of existing experiences and an enabler of new ones. The use cases section in this report explores many higher-value experiences that 5G can enable, and what consumers find appealing about each service.

Speed is a key 5G selling point

That said, there is a strong advantage to emphasizing the speed benefits of 5G more generally, to entice 4G users for whom speed is the key concern. Nearly two-thirds of early 5G users are highly satisfied with the speeds they experience on 5G networks, compared with less than half of 4G users.

Barriers to use in areas where 5G is available



More 5G devices will spur wider adoption

Despite the enthusiasm, there are still barriers to 5G adoption, even in areas where coverage is available and consumers are motivated to upgrade.

Only 20% of the consumers we surveyed currently own a 5G phone. Of those who intend to buy one in the next 12 months, key demographics include people who already make heavy use of their smartphone: for security monitoring, working remotely from home, or watching streaming video.

Phone adoption is a major barrier to use in areas where 5G is available, with 45% saying they don't own a 5G phone, 38% saying 5G data plans are too expensive, and 30% saying 5G models are too expensive.

While over 50% of respondents who are satisfied with their current service find 5G appealing, 44% indicate there isn't currently enough motivation for them to upgrade. This speaks to a real need for a combination of more consumer education about 5G and more choice of plans and models. In fact, we found that 90% of the 5G phones currently owned by respondents were from just two brands: Samsung and LG.

It's important to note, too, that phones and tablets aren't the only 5G devices that interest consumers. Our exploration of 5G video use cases revealed that 44% of consumers who are interested in 5G video said they would be willing to purchase a 5G camera in the next 12 months. With video doorbells, VR headsets and FWA modems all making headway, there are opportunities for CSPs to showcase more types of 5G devices to drive interest and demand.

The more consumers understand about the potential of 5G, the more appealing they find it.

Five consumer use cases for 5G



Five consumer use cases for 5G

While there are many potential consumer use cases for 5G, research conducted by Nokia Bell Labs uncovered five overarching 5G services likely to be of most interest to a consumer audience.

Mapping the consumer 5G opportunity by use case

A key aim of our research was to assess the opportunity for CSPs that are exploring which value-added 5G services they should offer to their subscribers. We asked consumers to rate each service in terms of its appeal.

- **FWA:** 5G FWA provides a viable alternative to wired broadband in the home, offering additional choice, easy DIY installation, and in some cases faster speeds and greater reliability.
- **Video streaming and alerts:** 5G enables interruption-free video calls and media streaming, as well as the ability to stream from drones, bikes and non-wired locations. Paired with analytics, 5G-enhanced video can act as a sensor, detecting objects or faces and triggering alerts.
- **Immersive experiences:** 5G is an enabling technology for digital experiences ranging from augmented and virtual reality to cloud gaming. 5G is set to catalyze adoption of immersive experiences by paving the way for lighter, cheaper and less compute-intensive equipment.
- **Smart venues:** With consumers frustrated by poor connectivity and reliability in crowded places, 5G will enable high-quality video calling, streaming and uploading from events, as well as enriched experiences at sports games, concerts, theme parks, museums, and more.
- **Connected vehicles:** 5G is a key enabler of next-generation in-vehicle features like precise navigation and streaming entertainment, as well as vehicle-to-vehicle and vehicle-to-infrastructure communications for enhanced safety and driving efficiency.

FWA holds the highest appeal – even above eMBB

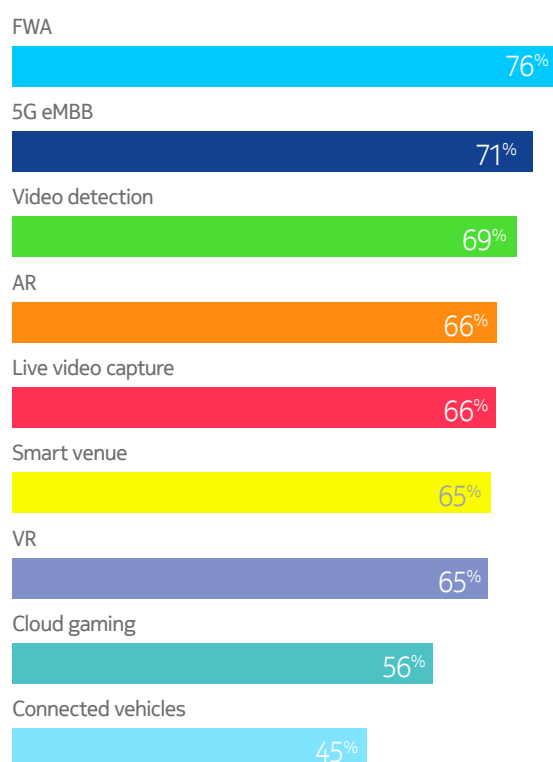
5G FWA is a winning use case for 5G with 76% of consumers rating it appealing – making it even more attractive than 5G eMBB. Video, Augmented Reality (AR) and VR, and smart venues were all rated appealing by around two-thirds of respondents, with only cloud gaming and connected vehicles showing lower levels of appeal.

However, when we looked only at results from self-identified gamers and vehicle owners, we saw appeal levels rise to over two-thirds of gamers who use a dedicated console, and nearly three-quarters of vehicle owners.

The clear takeaway is that 5G-enabled services are appealing to the majority of consumers when they understand the 5G difference and added value.

The attractiveness of each use case are very different though, so it will serve CSPs well to understand what consumers find appealing about each. They will then be able to craft marketing strategies that speak to specific interests and aspirations – rather than falling back on a simple “5G is better than 4G” message.

Appeal of 5G use cases



5G fixed wireless access

Consumers are overwhelmingly interested in FWA in the home, with 76% rating it as appealing – even higher than eMBB. These findings validate the perception of FWA as a near-term opportunity for CSPs in all geographies, and particularly in the US, where 82% of consumers rated FWA appealing.

Cost of broadband service is a major consumer pain point

Digging deeper into consumer perceptions, we discovered that the main issue consumers have with their current wired broadband is the cost of the service, rather than the speed or reliability of the connection. Cost emerged as the top issue in all three geographic regions, but more so in the US and South Korea than in the UK.

Among all markets, we found that two-thirds of consumers would be willing to pay the same for FWA as they currently do for wired internet, with 45% indicating they would be willing to pay 10% more. This suggests that consumers see 5G FWA as a like-for-like or better alternative to wired broadband and are willing to pay wired broadband-like prices for it.



The condo complex where we live only offers [one broadband provider], so we're locked into that, and the service is just – it's atrocious.

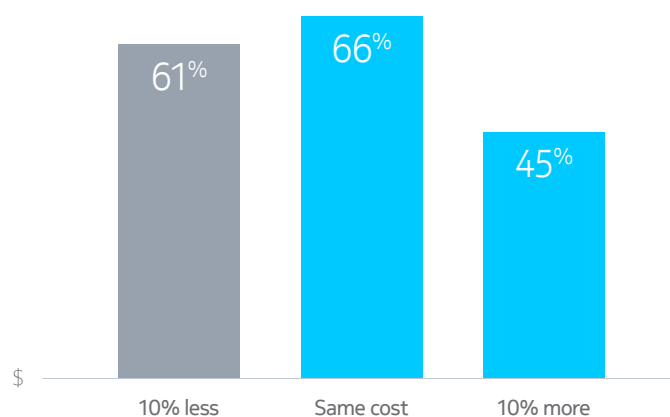
Focus group participant

This should be encouraging news for CSPs, suggesting they don't necessarily have to compete on price with wired providers if they can find other ways to add value to consumers. Focus group participants said they'd be willing to pay more for 5G FWA if there were no data caps or throttling, for example, or if the provider was transparent about the actual speeds they'd be able to achieve.

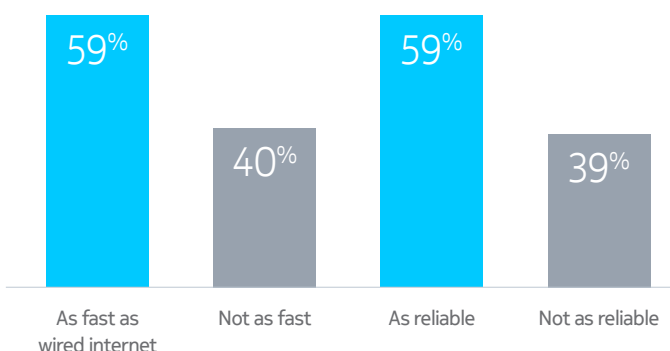
FWA can also address some other aspects of wired service that consumers find frustrating, such as having to wait for an engineer to come out to their home for installation. For many US respondents, having only one provider of wired broadband was also a source of frustration, especially in condos and other shared units where another provider option would be very welcome.

Quantitatively and qualitatively, CSPs should also bear in mind that around 40% of consumers are yet to be convinced of the performance and reliability of 5G FWA compared to wired broadband, and would be reticent to sign up for it.

Willingness to pay for 5G FWA

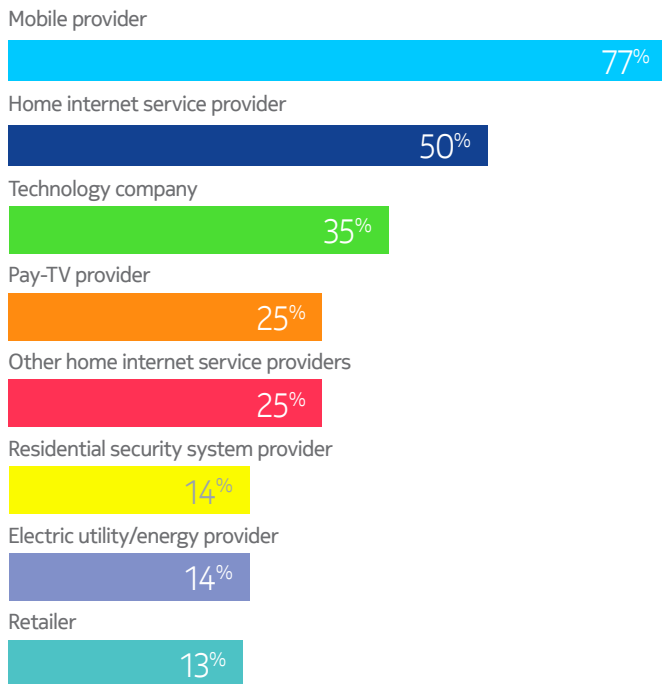


% rating 5G FWA very appealing by believability of 5G speed/reliability





Preferred provider of 5G FWA



Finding the right strategy will be key

There are many opportunities for CSPs to capture share from wired broadband providers by developing attractive FWA offers that consumers find appealing. The key will be in proving that 5G can perform as well as wired options.

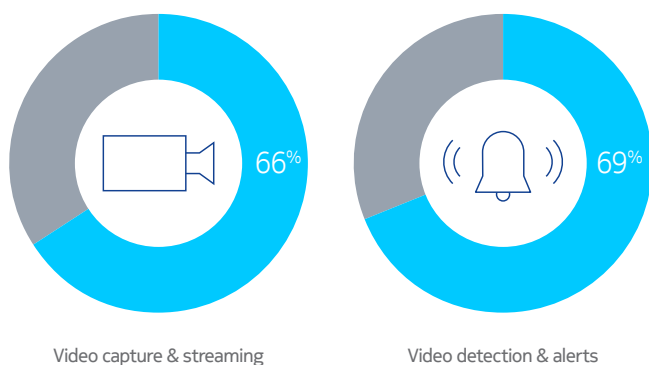
For example, participants in the focus groups liked the convenience of DIY installation, and showed an interest in free or low-cost trials. With no technician required for FWA service, free or discounted trial periods could be offered easily and at lower cost to prove the quality of the service and convert more consumers.

Another opportunity – and possible threat – lies in the provider landscape. While 77% of consumers assume they'd get 5G FWA directly from their mobile provider, over one-third said they'd be open to receiving it from a tech giant like Apple, Amazon or Google. Others said they'd consider getting it from a pay-TV provider, retailer, energy provider or residential security company. This suggests the possibility of new Mobile Virtual Network Operator (MVNO) partnerships to maximize reach and market share – particularly in markets where tech giants run a close second to mobile operators.

The majority of consumers find 5G FWA appealing, and will switch provider if the service is at parity and is offered at an acceptable price point.

5G video

A majority of consumers find 5G video capture and detection applications appealing

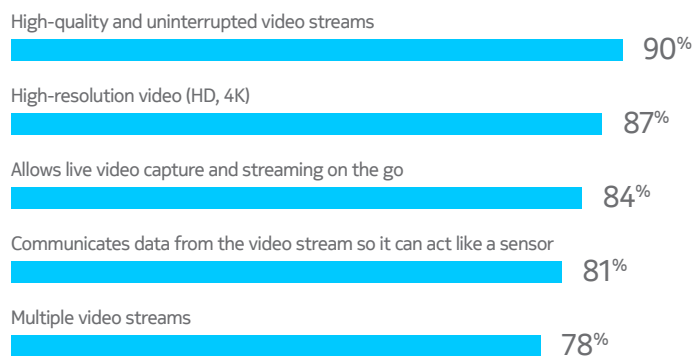


Even before COVID-19 made video calling ubiquitous, consumers found video the most appealing 5G-enhanced service. To understand more about their interests, we sub-divided video into two separate use cases: video capture and streaming, and video detection and alerts.

Video capture and streaming covers a range of activities from video calling via Skype or Zoom, to livestreaming on a platform like Facebook Live, capturing video with a drone or camera like a GoPro, or security monitoring of a front door, perimeter or second residence.

With video detection and alerts, streaming video is analyzed using AI in the cloud, to create a real-time detection and alerting service. Consumers are interested in 5G video detection for services like detecting when someone is at the door and recognizing if it's a family member, or keeping watch over an elderly relative and getting an alert if they fall.

Value of benefits of 5G video capture

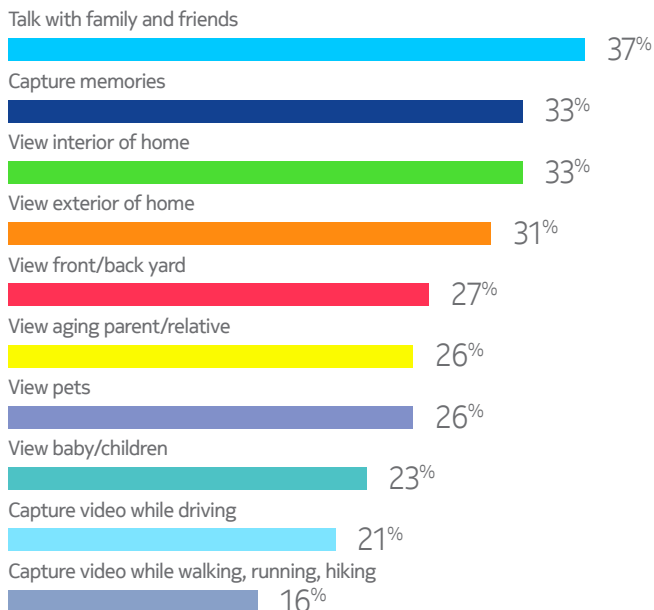


Video calling, capture and streaming

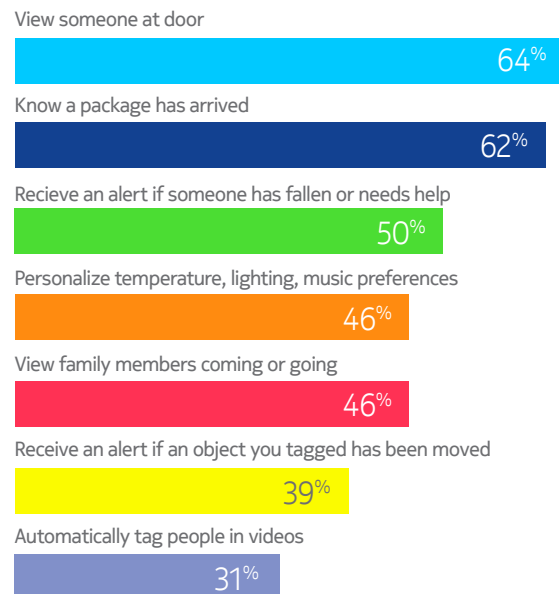
At the time of the survey, video calling was already a popular activity, with 47% of respondents saying they'd made a video call in the past month. It's also an area where consumers are frustrated by the poor service encountered with 4G and home broadband, with 90% of respondents saying they'd value the high-quality video and uninterrupted streaming that 5G can bring.

Whether staying in touch with friends and family, taking remote classes, or working at home, video communication has become a bedrock of social interaction during COVID-19. The promise of interruption-free video calls from anywhere will be a highly valuable proposition.

Top 10 uses cases for 5G video capture



Desired alerts with 5G video detection



But consumers are interested in more than just video calling – 84% said they find the prospect of video capture on-the-go appealing, and 44% of those who find 5G video appealing said they would be interested in buying a 5G-enabled camera in the next 12 months.



If I'm using the drone right now, the drone needs to come back to me to get the 4K in the computer. But if the connection is 5G and it's supposed to be super-fast, I wouldn't need to have that. It would be already in my phone or somewhere in the cloud.

Focus group participant

Whether the camera will be used for live streaming, or attached to a bike or drone, there's a significant opportunity for CSPs to emphasize the benefits of using 5G for high-quality, high-definition mobile video. Even more so as around one-third said they'd prefer to pay for 5G camera connectivity as part of their mobile or home broadband bill, rather than in the upfront cost of the device.

Video detection and alerting

Detection and alerting is a higher-value use case, requiring data processing in the cloud with analytics and AI for real-time alerts. It also emerged as the more appealing use case of the two, with 69% of consumers rating it appealing, compared to 66% for calling and streaming.

It's worth noting that video detection and alerting is already available for many devices, including doorbells and security monitoring cameras, and 37% of respondents said they already own a video capture device that's not a smartphone. The value of 5G will be in the ability to monitor and analyze activity in non-wired locations. CSPs should emphasize services such as perimeter monitoring, wildlife monitoring, or monitoring of a second home while not in use.

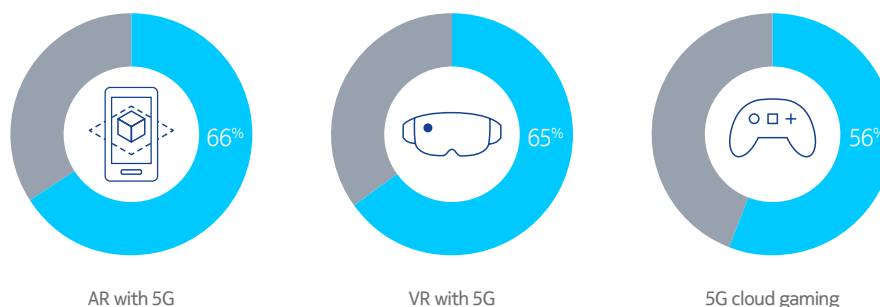
Additionally, social isolation of seniors due to physical distancing makes caregiving significantly more difficult. Caregivers will be newly motivated to research and trial tools that enable remote monitoring of their loved ones, and may find 5G-enhanced video with alerts or notifications valuable.

As with 5G FWA, residential security systems providers could be a key channel to market to broaden opportunities.

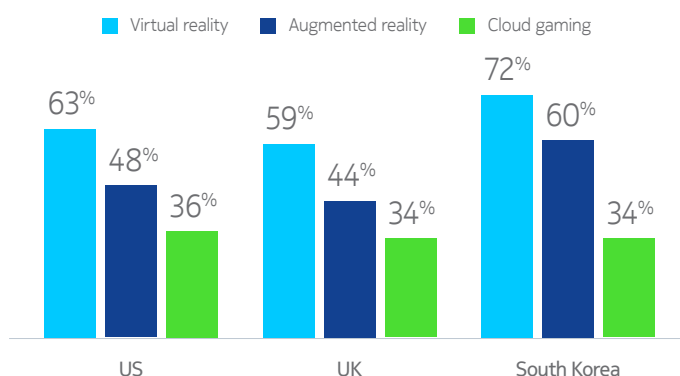
Video applications are both popular and necessary, and consumers are ready to hear how 5G can enhance and extend their use of video capture, streaming, calling, monitoring and detection.

Immersive experiences

A majority of consumers find 5G immersive experiences appealing



Familiarity with immersive experiences



Appeal of 5G-enabled immersive apps for education

Provide access to interactive educational experiences

67%

Interact virtually with students or faculty in other locations

57%

Unique travel, gaming, or entertainment for brand engagement

33%

The immersive experiences category includes three separate service types: augmented reality (AR), virtual reality (VR), and cloud gaming.

Our survey found some interesting contrasts between familiarity and adoption in these sub-categories. While over two-thirds of respondents are familiar with VR, for example, less than 20% currently own a VR headset. By contrast, less than half of consumers are familiar with AR as a term, but 63% have tried an AR application of some kind.

While there's relatively low familiarity with cloud gaming in the mainstream population, there's a large worldwide community of dedicated gamers for whom the ability to play high-end games in the cloud is very appealing.

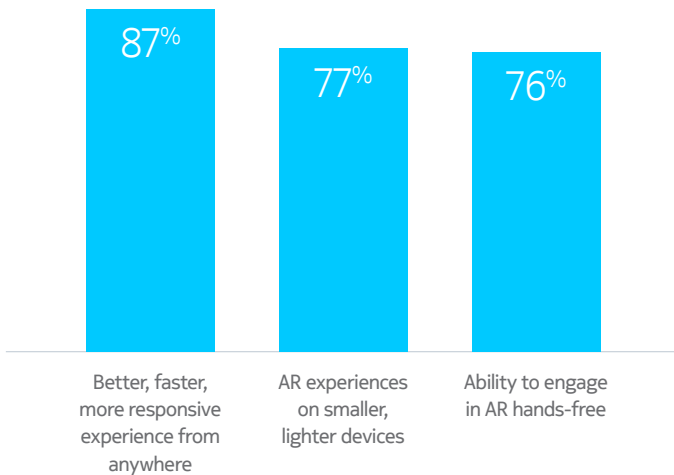
We also uncovered some significant differences between the three geographies – in particular, a significantly higher familiarity with VR and AR in South Korea. CSPs will likely need regional strategies to make headway in these categories.

It's important to note that AR, VR and cloud gaming are all possible without 5G, which means CSPs will need to be clear about the value that 5G can bring to these experiences. For some applications, 5G could be a catalyst for mainstream adoption, so working with software and hardware developers to communicate a clear message about 5G enhancement could be a win-win for everyone.

Social distancing and self-isolation as a result of COVID-19 may accelerate demand for all three service types, by enabling consumers to interact with others and experience new worlds and places, all without travelling or even leaving home.

The crisis has also driven widespread adoption of remote learning platforms and technologies by schools, laying the groundwork for future adoption of 5G-enabled immersive learning. Our industry study found that 67% of educators find 5G appealing as an enabler of interactive educational experiences.

Valuable benefits of 5G-enabled AR



Augmented reality

Nearly two-thirds (63%) of respondents said they'd tried one or more AR applications – from a smartphone game like Pokémon GO to the backup camera on their car – but they don't tend to view these experiences as belonging in a single category, and often aren't aware that what they're using is called augmented reality.

This suggests that CSPs looking to promote the benefits of 5G should focus on the value for individual AR applications rather than for the category as a whole. Key target demographics include people who drive, who travel, and who shop online on their phone. That's because consumers showed interest in experiences like digital overlays for in-vehicle navigation, translation of signs and menus in a foreign language, and the ability to visualize how items will look. COVID-19 may give additional impetus to AR shopping apps, as people can try out clothes, items and makeup without leaving home.

In terms of 5G, benefits that emphasize faster and more responsive service from anywhere was valued by almost all respondents who find AR appealing. The promise of high-performance AR on lighter, more mobile devices was also highly rated, as was the ability to engage hands-free with AR displays, using smart glasses.



Virtual reality

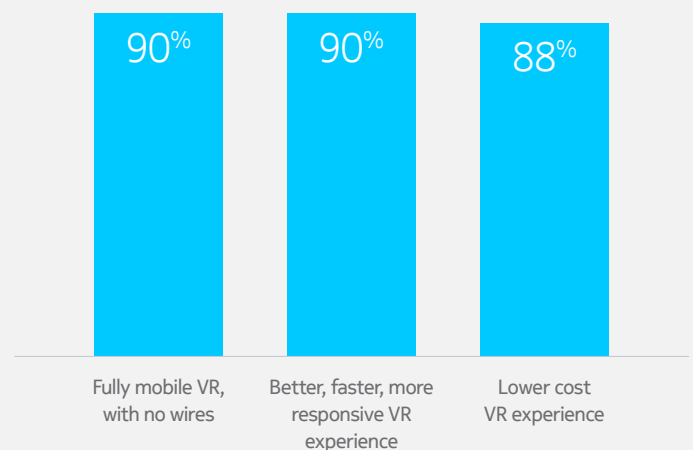
VR is an area where 5G really has the potential to catalyze wider adoption, as the ability to offload the data processing to the cloud, with minimal lag, paves the way for a new generation of lighter and less expensive headsets.

The ability to be fully mobile with a VR headset, and to enjoy a lag-free experience, were both highly rated by consumers who find 5G-enabled VR appealing. Since device costs are often a barrier to entry, the potential for lower-cost equipment was also well received, suggesting CSPs could emphasize all of these benefits equally in messaging around 5G-enhanced VR.

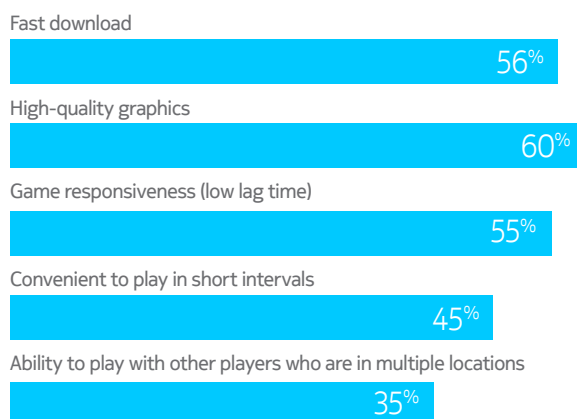
Key demographics for 5G-enabled VR experiences include younger generations and people with children at home. They show particular interest in the ability to play videogames as an immersive experience, to travel virtually to places of interest, and to experience activities they may not have a chance to do in real life, such as space travel and flying a plane.

Here again, the travel and social restrictions of COVID-19 may be the inflection point for VR, as consumers see more promise in technology that can help them experience places they can't travel to, or interact with people and things they can't see in person.

Valuable benefits of 5G-enabled VR



Important gaming factors



Cloud gaming

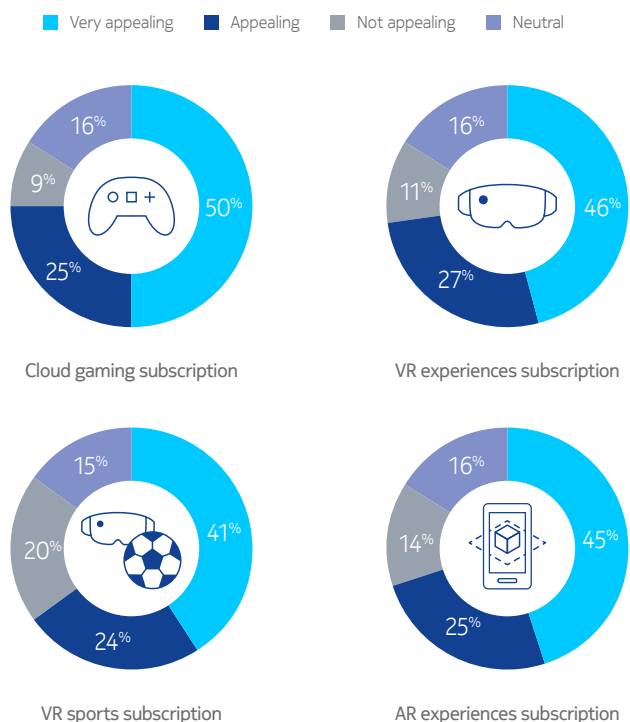
CSPs could find a very receptive market for 5G-enabled cloud gaming among dedicated gamers.

These are gamers who play regularly on a dedicated gaming console like an Xbox or PlayStation, or a handheld console like a Nintendo Switch, rather than a PC or smartphone. Unsurprisingly, this community mainly resides within the demographic of younger consumers as well as families with children at home.

Over half of gamers value quick updates, good graphics, and low latency, which can all be enhanced with 5G. Dedicated gamers told us they value all of the key benefits of 5G-enabled cloud gaming, including the ability to play console-type games on a smartphone or tablet; the ability to play anywhere; a lag-free gaming experience; and the ability to switch between devices while playing.

There are a lot of ways that CSPs can attract high-value subscribers among the gaming community. Free cloud gaming trials or bundles could help to upsell existing subscribers to 5G data plans, while zero-rated gaming services could attract subscribers from competitors. Exclusive, 5G-only content from game developers is likely to appeal, and some CSPs may be interested to explore the potential of licensing a cloud streaming platform to offer their own branded game streaming services.

Appeal of 5G immersive service subscriptions



Subscription services hold high appeal

Consumers showed strong interest in packaged subscriptions for different types of immersive experiences.

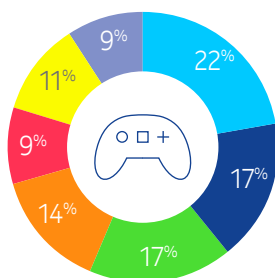
We tested the idea of different subscription bundles – a cloud gaming subscription that gave access to a library of games; a VR subscription to a library of experiences including live events; a VR sports subscription with immersive access to live sports events; and an AR experience subscription with access to unique AR content at concerts, sports games, museums and other venues.

A high number of respondents who already showed an interest in each use case found the idea of a subscription appealing. Although they represent a relatively small proportion (28-30%) of consumers overall, this does indicate a viable and interesting revenue stream for CSPs who can confidently target the right niche audiences with the right kind of subscription service.

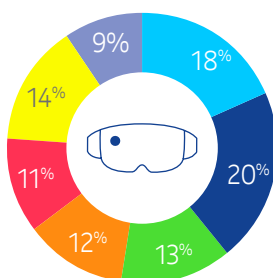


Preferred provider of 5G immersive services

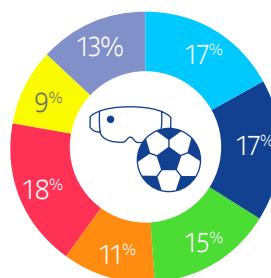
- A gaming, virtual reality or augmented reality company
- My mobile provider
- My broadband provider
- My phone's mobile store
- A company associated with the experiences I like – sports teams, bands, museums, travel companies
- A retailer
- My TV provider



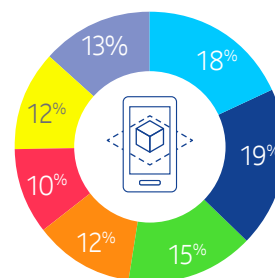
Cloud gaming subscription



VR experiences subscription



VR sports subscription



AR experiences subscription

Revenue models and channels to market

Many immersive experiences are still in their infancy, and consumers' minds are currently very open about who might provide the kinds of subscription we asked about.

Around 20% envisaged receiving immersive services as a package from their mobile provider, which is good news for CSPs. However, equal numbers felt they might buy subscriptions direct from a gaming, AR or VR company.

With broadband providers, retailers, app stores and pay-TV providers also in the mix, there are opportunities for CSPs to explore partnerships to help develop attractive propositions and maximize market reach. CSPs' large customer bases and well-developed sales, service and support capabilities could be a draw for developers looking for a channel to market for new games and experiences.

AR has the broadest appeal of the three immersive use cases, but there are pockets of highly engaged users who will find 5G-enabled VR and cloud gaming appealing. Immersive applications as a whole may also take on new value in light of physical distancing, remote learning and work.

Smart venues

While COVID-19 restrictions prevent people from gathering at large-scale events and sporting events, in the longer term there will be attractive opportunities for CSPs in this area.

Nearly two-thirds (65%) of respondents find the idea of 5G-enhanced venues appealing – whether it's a stadium game, concert, festival, theme park, museum, or any other place where large numbers of people congregate.

Connectivity in a crowd

It's a good use case to highlight in consumer 5G marketing, because so many people can relate to the experience of poor connectivity in a crowded place. More than three-quarters (78%) of respondents had attended a live event in the past year, and of those who found the idea of smart venues appealing, 89% said they would value faster speeds and 87% would value better service reliability.



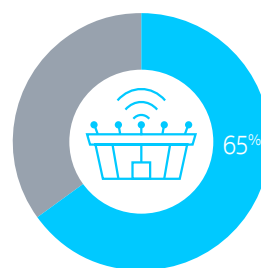
I went to a sports game at a local stadium, and I couldn't do anything with my phone. I can text and call, but if I want to send a Snapchat or post a story, it struggles to work at a big concert or big event like that.

Focus group participant

Digging into the reasons why, we found that people like to be able to upload photos and video from the venue to social media, or share photos or video with friends. 39% said they use their smartphone to look up information while at the venue, and others mentioned they enjoyed being able to order food and drink from their seat.

The bottom line is that consumers increasingly want to use technology to enhance their event experience, and very often existing 4G connectivity is letting them down. Emphasizing 5G's ability to provide faster speeds and better service is likely to resonate with consumers. It also ties in nicely with urban-first rollout plans, since congested venues are typically in urban areas.

Appeal of 5G-enhanced smart venues



find smart venues appealing

Value of benefits of 5G-enhanced smart venues

Get faster service speeds in a crowd



Get better service reliability in a crowd



Access event/venue navigation and meet-up tools



View multiple live video feeds of an event on your phone



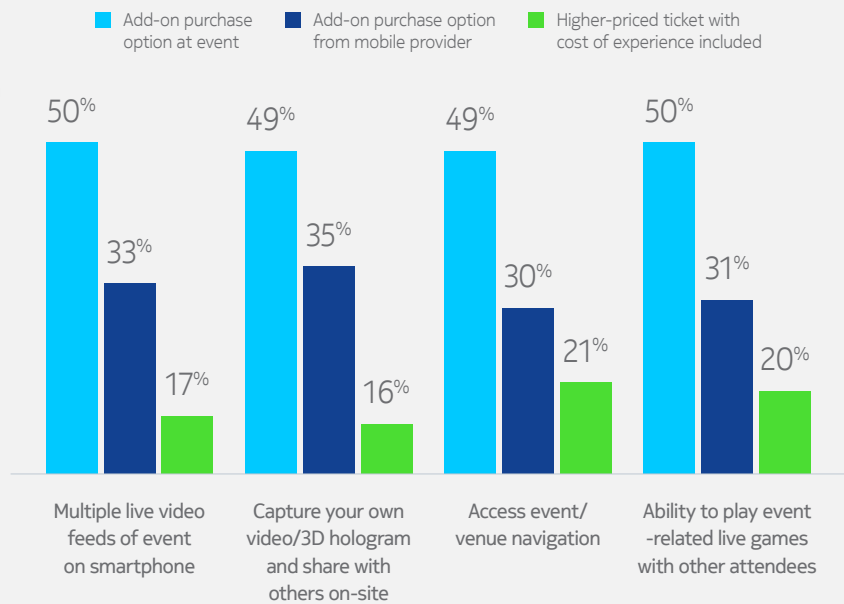
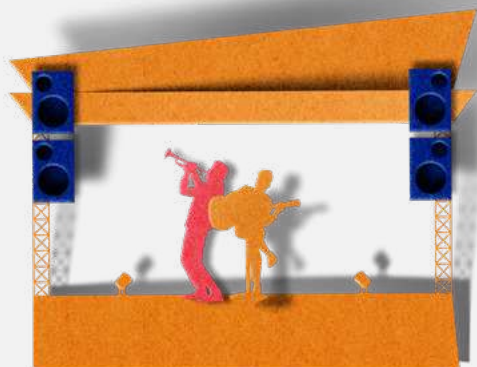
Capture video, 3D hologram footage to share with others at venue



Play live games with other attendees



Preferred smart venue payment model



Enriched mobile experiences

However, eMBB isn't the only benefit of 5G to highlight for smart venues. As people grow more used to a tech-enabled world, 5G has the potential to enrich their venue experiences in other ways, too.

Over three-quarters (77%) of respondents cited enhanced navigation around the venue – perhaps with AR overlays and access to further information – as an appealing benefit, along with the ability to locate, meet and interact with others at the same event.

Real-time video feeds from other areas of the venue, or other games happening at the same time, were also appealing. In the focus groups, some immediately saw that access to real-time scores and player stats could be useful for sports betting.

The most promising demographics for these types of enriched experiences include people who have recently attended a professional auto race, visited an amusement or theme park, or attended an outdoor festival. Over half of the consumers who'd done any of these things in the past year found the idea of a 5G-enabled smart venue highly appealing.

An opportunity to explore new models

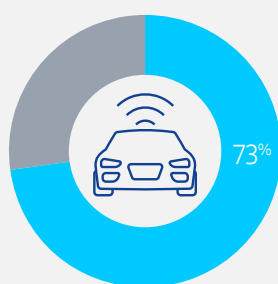
A lot of this is new ground that 5G will make possible, so there is room to explore in terms of developing appealing packages, partnerships and business models.

While only around 20% of respondents said they'd be willing to pay a higher ticket price for access to enhanced experiences, around half said they'd prefer to pay for such experiences as add-ons when they get to the venue, and about one-third would be willing to have them added to their mobile bill. There's a lot for CSPs to explore here, including partnerships with venues and sports teams, as well as geolocation targeting with offers when consumers enter a 5G-enabled venue.

Better connectivity and service reliability in congested areas are easily understood and highly appealing aspects of 5G.



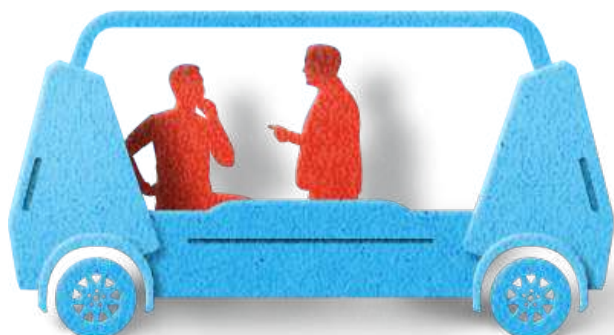
Connected vehicles



of vehicle owners rate 5G
connected vehicles appealing

While nearly half of all respondents found the idea of vehicle connectivity appealing, the figure rises to 73% of vehicle owners. That makes connected vehicles an interesting use case for CSPs, particularly in markets with higher car ownership. To monetize this use case, CSPs will need to prove the 5G difference by showcasing 5G-enabled connected vehicle services that aren't possible today with 4G. They will also need to make those services enticing enough for consumers to want to pay for them.

We found that most vehicle owners already use some kind of connected vehicle feature, either directly or by pairing their car with their smartphone. Voice calling, navigation and audio streaming were the top three applications, and all of these are standard rather than premium features. Paid-for features, like auto-calling of emergency services, or insights into driving behavior, are used by only 23% and 19% of respondents respectively.



Road safety and navigation are top services

Some areas do look ripe for exploration, however. Survey respondents were enthusiastic about enhanced safety features like receiving real-time alerts of hazards ahead, or when a pedestrian is about to cross a road. At the same time, however, they also worried that such enhancements might be expensive, and that too many warnings can lead to 'alert fatigue' and can end up being ignored or turned off. Respondents did welcome the idea of better communications between individual vehicles and the surrounding infrastructure, especially if it meant emergency services could get more information about an accident and access the scene more quickly.

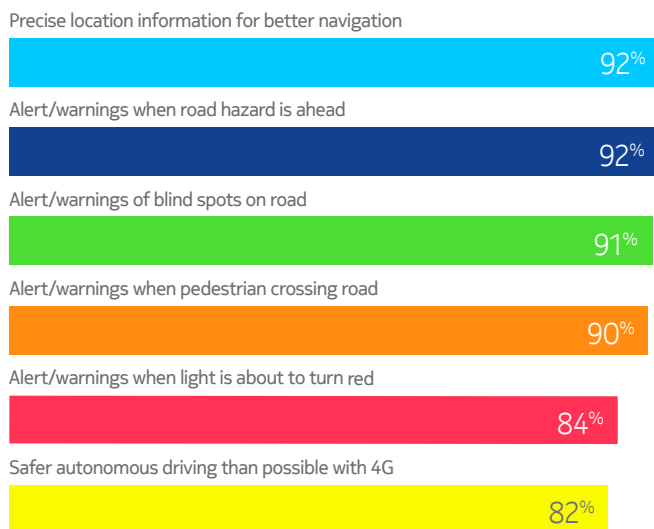


I love this idea because my husband and I consistently make wrong turns [following the GPS]. If something augmented would point the arrow down the street that I'm supposed to go down, that would save a lot of fighting

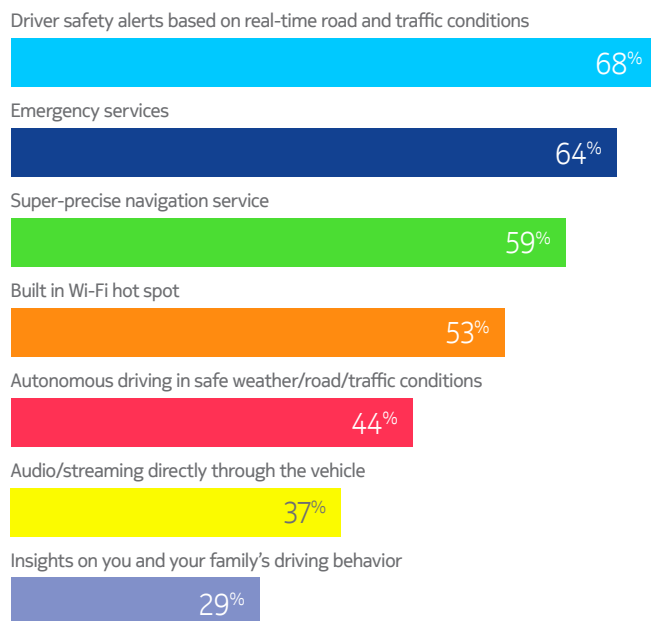
Focus group participant

Nearly all vehicle owners saw the value in enhanced navigation services, such as AR overlays clearly indicating which turn to take. 5G can help make vehicle positioning much more precise than is possible with GPS alone, allowing more detailed instructions for turning and lane changes.

Value of benefits of 5G connected vehicles



Desired connected features in next vehicle

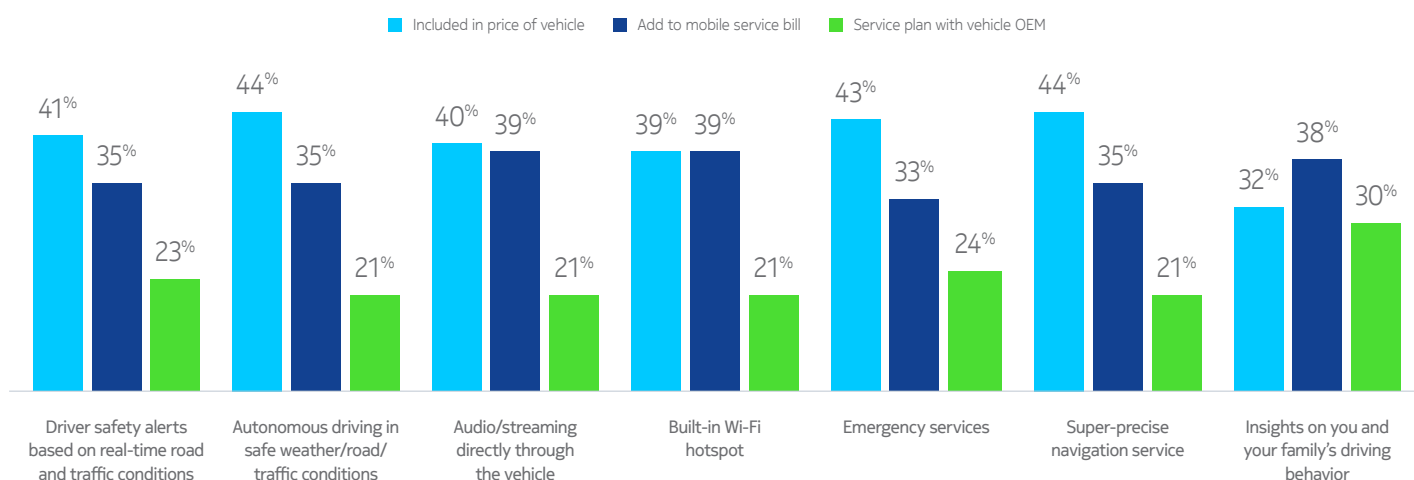


New revenue models to explore

When we asked vehicle owners about features they'd look for in their next vehicle purchase, safety alerts, emergency services calling and precise navigation all still came out on top. This suggests CSPs should be exploring ways to monetize services like these – either directly, or in partnership with automotive Original Equipment Manufacturers (OEMs) and dealerships. The field is quite open at the moment for new payment models, with many respondents saying they'd be willing to add 5G-enabled connected vehicle features to their mobile bill.

The majority of vehicle owners are interested in enhanced connectivity in the car, with improved navigation and safety features the lowest-hanging fruit.

Preferred payment models for 5G connected vehicles



Building blocks of a winning 5G strategy



Five building blocks of a winning consumer 5G strategy

CSPs should feel reassured that there is widespread consumer demand for the types of value-added services that 5G can enable or enhance – and that demand can be unlocked with more education around the 5G difference.

There are many factors to consider when drawing up a 5G go-to-market strategy, and every CSP will want to approach the market in their own way. But the key findings of our study suggest some broad approaches that will make attracting new subscribers a success:

1. Consumers want 5G when they understand it:

Drive demand by showing consumers that 5G offers much more than 'faster 4G'. Targeted campaigns and success stories will convince the wider consumer population that 5G can enrich many areas of their daily life.

2. Consumers are willing to pay more for 5G:

Earn the right to charge a premium with attractive 5G offers that go beyond faster connectivity. Immersive experience subscriptions, connected vehicle features, and smart venue experiences could all work well with the relevant audiences.

3. Engaged users will switch provider to get 5G:

There's a clear first-mover advantage here, so roll out 5G early, find engaged users, and entice them to switch with high-value offers that align with their current 4G use. Home monitors, media streamers and remote workers are all good targets.

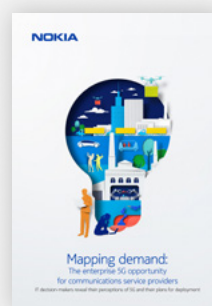
4. FWA and video are the top use cases beyond eMBB:

Unlock demand for 5G FWA with attractive pricing offers and success stories that prove its performance and reliability. For video, emphasize the speed, quality and wire-free aspects of 5G for specific video services.

5. Opportunities abound for CSPs to expand beyond connectivity:

With the widespread appeal of 5G-enhanced services like home security, cloud gaming, live events and in-vehicle infotainment, explore the potential for higher-value 5G services and forge partnerships to maximize market reach.

Next steps



Read our enterprise report

Mapping demand:
The 5G opportunity in enterprise for
communications service providers.

Learn more about 5G use cases:

<https://www.nokia.com/networks/5g/use-cases/>

Schedule a presentation

Please contact us to discuss the findings of this
research in more detail.





Appendix:

Methodology

The data in this report is drawn from a survey of 3,000 consumers conducted by Parks Associates for Nokia and completed in January 2020.

The margin of error for results based on the full sample size is +/- 3%

Geographical distribution:

1,000 smartphone users in each of three markets: US, UK and South Korea.

Demographics:

Adults aged 18 and older who are smartphone owners, broadband internet users, and the primary decision makers in their household. Demographic quotas set for age, gender, and household income ensured samples were representative of the population of each market surveyed.

Qualitative data and insights were drawn from four focus groups with 30 consumers, held in November 2019 in New York and Dallas.



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