5 December 2018

The Manager

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ELECTRONIC LODGEMENT

Dear Sir or Madam

Telstra 5G Update - 5 December

In accordance with the Listing Rules, I attach the presentations and speeches to be delivered by Andrew Penn, CEO and Robyn Denholm, CFO at Telstra's 5G update today, for release to the market.

A transcript of the event will be lodged with the ASX when available.

Yours faithfully

Sue Laver
Company Secretary

ROBYN DENHOLM – CFO

Welcome

Welcome everyone to today's presentation and thank you for being here for those who have joined us in the room here in Telstra's Customer Insight Centre, as well as those who are joining us via the livestream.

I'm Robyn Denholm, Telstra's Chief Financial Officer and Head of Strategy.

I'd like to begin by acknowledging the traditional owners of the land we meet on today – the Gadigal people of the Eora nation. I pay my respects to their Elders past, present and emerging.

I'm super excited with the purpose of today's briefing, which is to provide you with a detailed update on years of work that the collective team at Telstra has put in to 5G.

You will hear about both our achievements to date and our plans for the future.

Today is also an opportunity for you to hear from the new members of our leadership team: Nikos Katinakis (Group Executive Networks & IT), Michael Ackland (Group Executive Consumer & Small Business), Michael Ebeid (Group Executive Enterprise), and Christian von Reventlow (Group Executive Products & Technology).

Agenda

Briefly, let me give you the agenda for the rest of the afternoon:

- Andy will give us an update on T22 and an overview of Telstra's 5G leadership
- Nikos will cover the technology that is powering 5G and the benefits it will bring
- Michael Ackland and Michael Ebeid will talk you through some of the most interesting use cases for 5G
- Christian will paint a picture of longer-term growth opportunities and the implications for our industry
- And then the six of us will come together on stage for a Q&A session

You will have an opportunity to experience 5G and IoT in more depth at our showcases located in the foyer.

Some of you may have already been to the showcases and I hope you were excited by what you saw.

FY19 trends

Before I invite Andy to the stage to set the scene for today's discussion, I want to briefly provide some comments on the trends within our business.

Despite increased competitive intensity, which is expected to continue throughout FY19, the guidance for FY19 which we provided to the market in September remains unchanged.

Following on from the strong postpaid handheld subscriber growth reported in the last quarter of FY18, we have seen continued good subscriber momentum, and our productivity initiatives continue to reduce our core fixed costs.

I also want to provide some colour on the profile of our free cashflow on a guidance basis, H1 versus H2, across FY19 and why it will be different compared to previous years.

In recent years we have reported about a third of our full year free cash flow in the first half of the year. However for FY19 we are expecting free cashflow at the half to be a smaller proportion of the full year number. The two principal drivers are capex and a working capital increase mainly due to inventory.

Capex remains within the full year FY19 envelope, however we have brought forward more of this investment to 1H. For context we typically spend around 50% of our full year capex in H1, this year we expect to be spending closer to 60% in H1. We therefore expect our 2nd half capex spend to be lower than H1.

In terms of working capital we recognise that we have work to do in the second half.

Our restructuring costs in H1 are largely in line with our expectations. We continue to look for opportunities to pull forward restructuring costs where it makes sense.

While I have provided some comments on our free cashflow profile, the focus for today is on 5G and what it means for Telstra and our customers.

We look forward to providing more detail on our trading performance at our Half Year Results in February.

With those comments, let me welcome Andy to the stage.

ANDREW PENN – CEO

Slide 1 – 5G Update

Thank you Robyn.

Slide 3 - Welcome

Good afternoon and welcome.

Thank you for investing your time with us today. I am pleased to see so many here in person and I know many more are tuning in via our livestream.

As Robyn has set out, today you will have the opportunity to immerse yourself in the world of 5G and the significant opportunities it provides. We will also be taking you through our 5G strategy to take advantage of this new technology to provide growth for our future.

Obviously we are at the early stages of 5G and the technology will continue to evolve as there is ongoing innovation in every part of the ecosystem – whether that be operators such as Telstra, the radio access equipment manufacturers, in chipsets and devices. There are also lots of myths and falsehoods about the technology and today we are going to help you navigate through these to better understand just exactly where 5G is at and what it can do.

The telco industry is at a tough stage in its cycle as most operators have fully rolled out 4G and competition on price has increased. This is exacerbated in Australia by where we are at in the rollout of the nbn and the significantly negative impact it is having on industry economics.

Against this background, 5G heralds a new opportunity for growth particularly for those that will be leaders in this new technology as indeed Telstra is.

Before we get into 5G however, I want to provide you with an update on our T22 strategy. I want to take a moment to remind you of the rationale and context behind the strategy.

Slide 4 - T22 update

We identified more than two years ago the need to invest and create the platforms we believed we would need for the future. That is why we announced up to $3 billion of incremental investment over the three years to the end of June 2019.

We are well progressed with this work and we have made significant progress in digitising the whole of our network and ensuring we are 5G ready. We have also invested in replacing our core IT systems such as CRM; billing; order management and our customer interface systems – all of these systems are being built on a new technology stack, in the Cloud with an ecosystem of API's.

As I have said previously, in a company the size and scale of Telstra this is no small undertaking. The size and complexity of our network, systems, products and processes is enormous. Our networks and systems support 16m customers, we undertake 40m operations per day, we operate more than 100,000 servers on our premises.

The number of interactions we have with our customers and that our systems record is in the hundreds of millions a year, the number of transactions on our network is in the hundreds of billions.

That is why this program of investment has been very substantial and that is why it has taken time. It is also why frankly, Telstra, like many incumbent companies facing digital disruption, has put this investment off for too many years.

The good news is we are two years in and we are very well progressed. We are well progressed with the program that creates the platform that will enable us to take advantage of the opportunities from new technologies such as 5G and provide the functionality to radically simplify and automate our business and deliver a very different customer experience.

The reason this decision taken in 2016 to transform our networks and systems has been so important is because of how very difficult the economic implications of the nbn and flow on impact to the competitive dynamics in the industry have become.

That is why in June this year we also made the decision to be much more aggressive in the transformation of the business through our T22 strategy leveraging these investments. And let me be clear our T22 initiatives would just not have been possible without these investments.

In picking our timing for T22 we had to balance the critical need to transform on the one hand against the legacy in systems, products and processes built up over decades. We also had to recognise we would potentially lose $500m in annual fees and charges designed out of our products in the future.

T22 therefore is not without risk, but simply we believed we had reached a tipping point. A point where we needed to be more prepared to disrupt ourselves then wait to be disrupted. Our investment program has given us the platform to support that.

Since we launched T22 in June we have already delivered a number of key early milestones.

Slide 5 – T22 Update (delivery)

For our customers we have removed excess data charges on our new consumer mobile plans which gives them greater cost certainty and eliminates a major pain point. We already have around a quarter of a million customers enjoying Peace of Mind data.

We have also offered consumer customers more choice when creating a home or mobile package. Customers can now select their base mobile or home broadband plan and add entertainment such as Kayo, the new Foxtel sports streaming service and an expanded range of technology and accessories with no upfront charges.
This is a critically important step towards our commitment to ensure customers are not paying for services they do not want.

We are also well progressed in reducing the number of Consumer & Small Business plans from 1800 to 20 while giving our customers more choice.

With technology opening new opportunities for small businesses on a daily basis, next week we will be announcing major enhancements to the support we provide this segment. This includes new solutions and services designed to add more flexibility, reliability, value, cost certainty and expert service and advice.

In Enterprise, Connected Workplace, our first solution to be delivered on our new B2B digital stack launches next week. In addition, we have launched our Track and Monitor IoT solution that gives our customers automated, mapped visibility of their moving assets at scale.

We have stood up Telstra InfraCo, our standalone infrastructure business unit, to drive improved performance and create optionality for the future. We are on track to segment report InfraCo at the half year and for it to be fully operational by June 2019.

In October we implemented our new end-to end functional structure and operating model. This elevated our focus on product innovation with a new Product & Technology function and internal efficiency and effectiveness with the new Global Business Services function.

We are also well underway simplifying and flattening our structure and have already reduced one to two layers of management in many parts of our business.

When I updated the market at the AGM in October, I advised that we had announced a reduction of 2,600 FTE & Contractor roles. Since then we have announced further reductions increasing the total to approximately 3,000. Of these 2,000 roles have already left the business

The combination of our investments and our T22 Strategy are enabling us to make a real difference to our customers.

Since 2017 we have reduced calls to our call centres by more than 25% or 10m calls per annum. We have also reduced complaints to the TIO by one third and increased Episode NPS by 13 points.

It has been a tough operating environment over the last 2 years but we are starting to see some positive results from our efforts.

Furthermore, while it is probably going to continue to be tough over the next 12 months, there are other reasons to be optimistic regarding the future.

One reason to be optimistic is I believe that ultimately the nbn operating environment will improve, particularly once the rollout is complete. The current wholesale price for the nbn is unsustainable and is leading to operators starting to exit the business and will ultimately lead to higher prices for consumers.

As you have heard me say before, this is something that will have to be addressed if the nbn and the industry is ever to be viable and sustainable.

Slide 6 - Why 5G matters

The second reason to be optimistic is what we have invited you here today to discuss. That is the new technology coming – 5G.

5G will be transformative for the industry and will offer opportunities for revenue growth.

Firstly, as 5G rolls out, as with 4G, I expect customers to be willing to pay more to access this new technology.

Secondly, 5G will enable new revenue streams that do not exist today.

This is on top of the immediate capital efficiency that 5G will deliver by reducing the cost per bit of data travelling over the network.

In each of the previous moves to a new generation of mobile technology, Telstra has been bold and led the market.

Our strong investment has given us first-mover advantage and ensured we could offer our customers Australia's best mobile network on the newest and best technology.

This approach has consistently delivered financial benefits to shareholders as we have seen more customers, more devices and more traffic move onto the Telstra mobile network.

We believe this will be the case with 5G too and we are already well positioned to be the leader.

Across the afternoon, we will cover 5G from a technical perspective, look at some of the near-term use cases and benefits for our customers, as well as some of the long-term growth opportunities and implications for our industry.

Slide 7 - Why is 5G different?

Before we start I want to explain what makes 5G different from previous changes in mobile technology.

In many ways 5G is more than just an evolution of mobile network technology. The true power of 5G lies in the fact that it is arriving at the same time as other technologies are maturing. These include software defined networks, the internet of things, cloud computing, machine learning and artificial intelligence.

This unique convergence of technologies is what makes 5G far more revolutionary than earlier shifts in mobile technology.
It also opens up a wide range of new market opportunities for telcos and you are going to hear more about these from Michael, Michael and Christian later

In the meantime just a few areas where 5G will be different.

•	Firstly, latency. Latency on 5G will be 1/30th (one thirtieth) of what we experience on 4G. This opens up opportunities in markets where milliseconds count such as automotive, healthcare, transport, mining, oil and gas and virtually all forms of robotics and virtual and augmented reality.

•	There will also be big gains in capacity through spectral and network efficiency. 5G features such as massive MIMO and beamforming will allow us to make better use of spectrum assets and deliver customers a faster, more reliable mobile experience. They will also open up new spectrum bands and allow us to deal with the continued growth of data travelling across our network, while holding total costs steady as costs per bit decrease.

•	Edge computing and software defined networking will mean that the true power of our mobile network is closer to our customers' devices than ever before. It will also make our network more flexible and responsive.

Nikos will take you through some of these network dynamics soon.

Slide 8 – How will we experience 5G?

However, as with 4G we don't expect to see all of 5G's capabilities arrive at once. In fact, we expect to see three horizons in the development and deployment of 5G.

Horizon 1 is where customers will be able to benefit almost immediately from the incremental improvements to speed and latency albeit it will not reach its maximum potential until later. This will enhance usage in areas such as gaming, broadcast services, and security. Horizon 1 is also where we will see lower cost per-Gigabyte as greater efficiencies in our network and in the way we use spectrum helps control costs.

Horizon 2 is where customers will see increasing improvements in new products and services. This will include precision IoT in agriculture, fixed wireless broadband at scale (using mmWave), and large-scale adoption of industrial automation.

Finally, Horizon 3 will see new use cases and emerging business opportunities up the stack and on top of connectivity. Some of these use cases, such as autonomous vehicles, remote surgery and augmented reality are obvious to us now. However, some new use cases will only emerge as the technology develops. Remember that in the early development of 4G, no one could accurately predict how this would lead to the development of the app-economy and the businesses and use cases built on it such as large scale video streaming.

Slide 9 - Telstra's 5G progress to date

We are at a critical moment in the development of 5G and Telstra is already a global leader in the race to develop and deploy it:

•	In late 2017, we completed a world-first 5G trial data call over mmWave spectrum using our production core network.

•	In February this year we launched the 5G Innovation Centre on the Gold Coast. That Centre has since been home to the world's first precinct of 5G-enabled Wi-Fi hotspots, Australia's first 5G

Connected Car, one of the world's first 5G esports experiences, and the world's first end-to-end 5G non-standalone data call on a commercial mobile network.

• In August, we announced we had started switching on 5G technology on our network on the Gold Coast quickly followed by the first regional cell site in Tamworth, making Telstra's network the first in the country to be 5G ready.

• In September we hosted a meeting of the global standards body, known as 3GPP, to progress the development of international standards.

• In October we turned on 5G-enabled mobile base stations in Adelaide, Canberra and Perth. We are the first carrier to deploy 5G in these three cities and these sites are among the first locations in Australia to be upgraded with 5G technology. We have set a benchmark of having more than 200 5G-enabled sites live by the end of 2018 and I'm pleased to say that as of today we have 130 sites live.

• In November, in partnership with our network partners Ericsson and Qualcomm Technologies, we achieved Australia's first use of a commercial 5G chipset in a form factor device over our commercial spectrum. This brought together all of the components of our end-to-end 5G network for a real-world 5G data call.

These achievements mean we are well on track to meet the commitments we have made as part of T22 to extend our network superiority and 5G leadership.

Finally, today I am pleased to announce that we have made the world's first connection of a 5G commercial mid-band device and Australia's first 5G to 5G video call. Before handing over to Nikos let me leave you with a video of that call.

Thank you.

5G Update
5 December 2018

Disclaimer

These presentations include certain forward-looking statements that are based on information and assumptions known to date and are subject to various risks and uncertainties. Actual results, performance or achievements could be significantly different from those expressed in, or implied by, these forward-looking statements.

Such forward-looking statements are not guarantees of future performance and involve known and unknown risks, uncertainties and other factors, many of which are beyond the control of Telstra, which may cause actual results of Telstra include general economic conditions in Australia; exchange rates; competition in the markets in which Telstra will operate; the inherent regulatory risks in the businesses of Telstra; the substantial technological changes taking place in the telecommunications industry; and the continuing growth in the data, internet, mobile and other telecommunications markets where Telstra will operate. A number of these factors are described in "our material risks" section of our Operating and Financial Review (OFR) which is set out in Telstra's financial results for the year ended 30 June 2018 which was lodged with the ASX on 16 August 2018 and available on Telstra's Investor Centre website www.telstra.com/investor.

In addition to the risks and uncertainties outlined above, there are particular risks and uncertainties in connection with the implementation of Telstra2022 including the response of customers to changes in products, the risks of disruption from changes to the organisation structure; that detailed business plans have not been developed for the entirety of the strategy and the full scope and cost of Telstra2022 may vary as plans are developed and third parties engaged; Telstra's ability to execute and manage Telstra2022 in a sequenced, controlled and effective manner and in accordance with the relevant project and business plan (once developed) and Telstra's ability to execute productivity initiatives and realise operational synergies, cost savings and revenue benefits in accordance with the plan.

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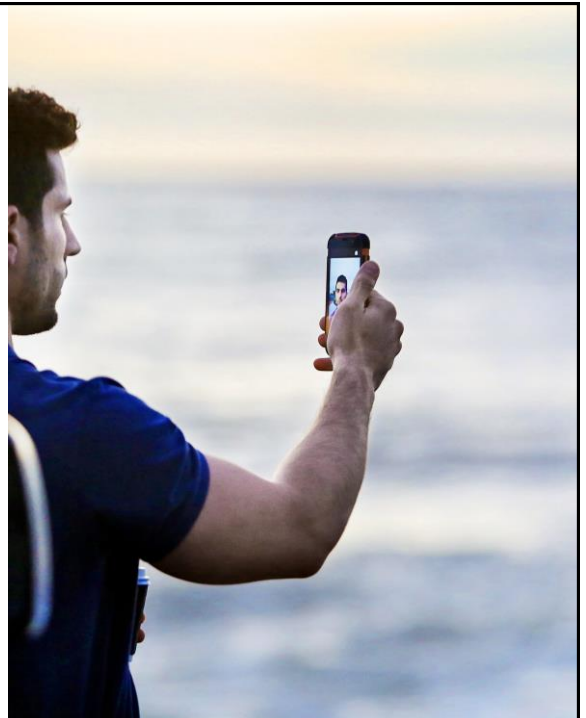
5G Update

Robyn Denholm
Chief Financial Officer and Head of Strategy

Agenda

12:15pm	5G and IoT showcases – pre	
1:00pm	Introduction and Agenda	Robyn Denholm
1:05pm	5G Update	Andrew Penn
1:30pm	5G Network	Nikos Katinakis
2:00pm	Bringing 5G to life for consumers & small businesses	Michael Ackland
2:15pm	Creating Enterprise value with 5G	Michael Ebeid
2:30pm	Future opportunities in 5G	Christian von Reventlow
3:00pm	Q&A	
3:45pm	5G and IoT showcases Over afternoon tea	
5:00pm	Event concludes	

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5G Update

Andrew Penn
Chief Executive Officer

Welcome

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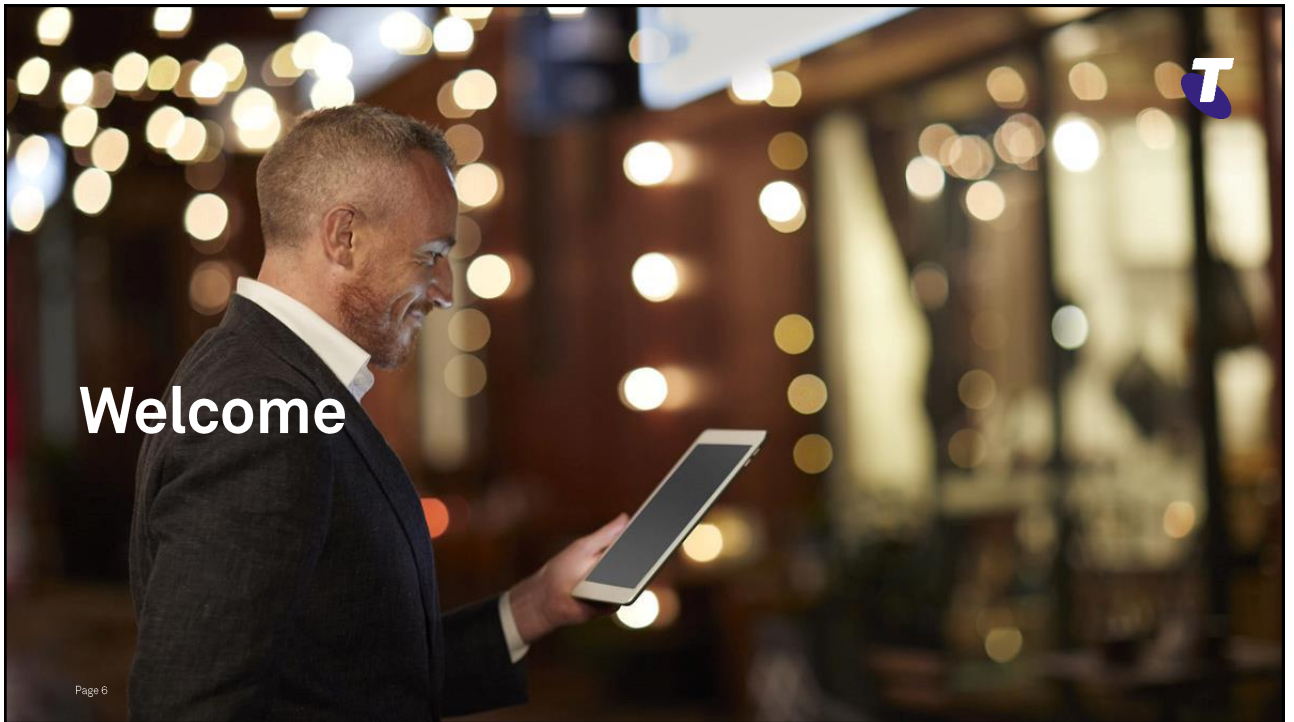
T22 update
Rationale and context

Investing to create platforms for the future
(up to $3b in incremental investments FY16 – FY19)

We are **well progressed** in this program of work

- Digitising our network and ensuring 5G readiness
- Digitising our business to enable more effective customer and employee experiences

T22 was a **bold, highly considered transformative shift** to lead and drive our business toward **radical simplicity** and **creating very different customer experiences**

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T22 update
Delivery

- **Removal of excess data charges** for our consumer customers on new, simpler mobile plans
- **Greater flexibility** and **choice** in mobile and home broadband plans
- Will shortly introduce **major enhancements** to how we **support small business**
- **Enterprise Connected Workplace**, on our first B2B digital stack and **Track and Monitor IoT solution**
- **Telstra InfraCo** established; on track to be fully operational by June 2019
- End-to-end **functional structure** and **operating model** elevating focus on **product creation** and **innovation**
- **Increased productivity** and **efficiency gains**

~235,000 customers enjoying Peace of Mind data*

Well progressed moving from **1800** to **20** Consumer & Small Business plans

Since 2017 we have driven:
- Call centre calls ↓ by **>25%** or **10m**
- Complaints to TIO ↓ by one third
- ENPS ↑ **13 points**

Since T22, we have announced **3000** role reductions across the business

Realised **$700m** of productivity benefits since FY16 to end of FY18

Page 8   *As at December 1, 2018

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Why 5G matters
Transformative technology

Why is 5G different?

Cloud

IoT

Edge Computing

5G

Artificial Intelligence

Software Defined Networks (SDN)

Machine Learning
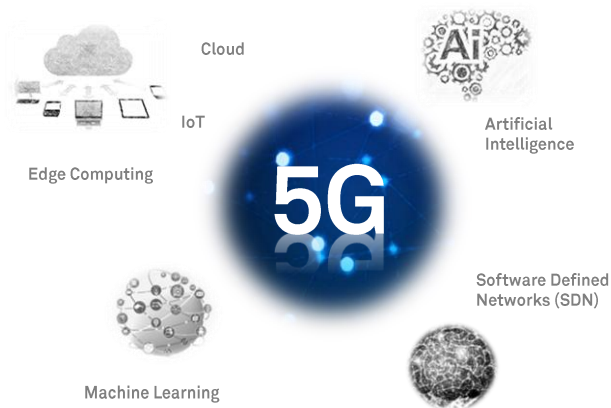
- Improvements to **latency**; empowering technologies in markets where **milliseconds count** such as automotive, healthcare, transport, mining, oil and gas, and virtually all forms of robotics and virtual and augmented reality.

- **Capacity** will be further enhanced through spectral and network efficiency, and when **new spectrum** becomes available, to deliver faster and **more reliable experiences**

- **Edge computing** and **SDN** will make our network more flexible and responsive

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How will we experience 5G?
Capability horizons

1. Customers benefit from incremental **speed** and **latency** to enhance experiences in gaming, broadcast services and security; anticipated **lower cost** per Gigabyte

2. Customers will see increasing improvements in the **products** and **services** available to them; including precision IoT in agriculture, fixed wireless broadband at scale (using mmWave), and large-scale adoption of industrial automation

3. **New use cases** and **emerging opportunities**, such as autonomous vehicles, remote surgery and augmented reality, however many are **yet to emerge**

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Telstra's 5G progress to date

📅 **2017**

- Our world-first **5G trial data call** over mmWave using our production core network

📅 **2018**

- Feb: our **5G Innovation Centre** launched, delivering the **world's first precinct of 5G-enabled WiFi hotspots**, Australia's **first 5G connected vehicle** and an end-to-end non-standalone **data call** on a commercial mobile network

- August: started switching on **5G** on the Gold Coast; first regional call site in Tamworth

- September: hosted **3GPP** supporting the progression of global 5G standards

- October: rollout of **5G-enabled mobile base stations** in Adelaide, Canberra and Perth

- November: in partnership with Ericsson and Qualcomm, we achieved **Australia's first use of a commercial 5G chipset in a form factor device** over our commercial spectrum

- We are **well on track** to meet our T22 commitments to extend our **network superiority** and **5G leadership**

📶 In another world first, we will share with you today, the connection of a **5G commercial mid-band device** and **Australia's first 5G video call**

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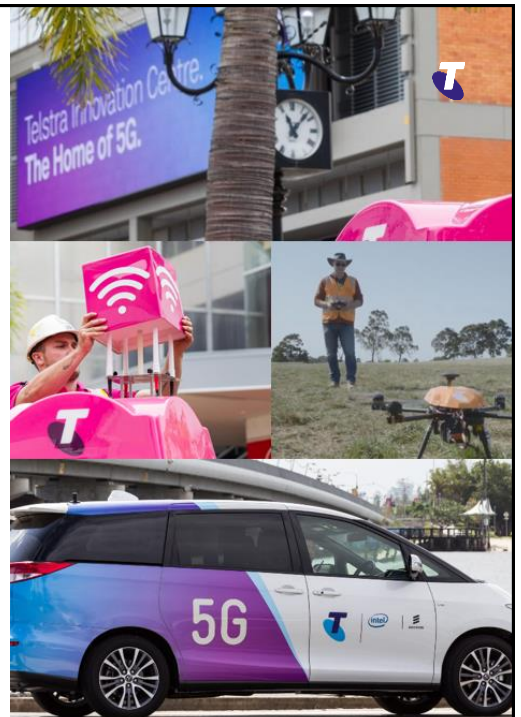
5G Network

Nikos Katinakis
Group Executive, Networks and IT

The Telstra Mobile Network

We have more than

9,700
mobile sites

... with

8,300
4G-enabled

We have

fewer
deadspots

... and more

reliable
speeds

Our network has more than

2.5m km²

mobile network coverage

Our mobile network has the

largest
coverage

vastly more than any other mobile network in Australia

We will be rolling out

650
sites

as part of the Federal Government's Mobile Black Spot Program

Enjoy a more reliable connection and

fewer
drop outs

across our national network, that works in more buildings

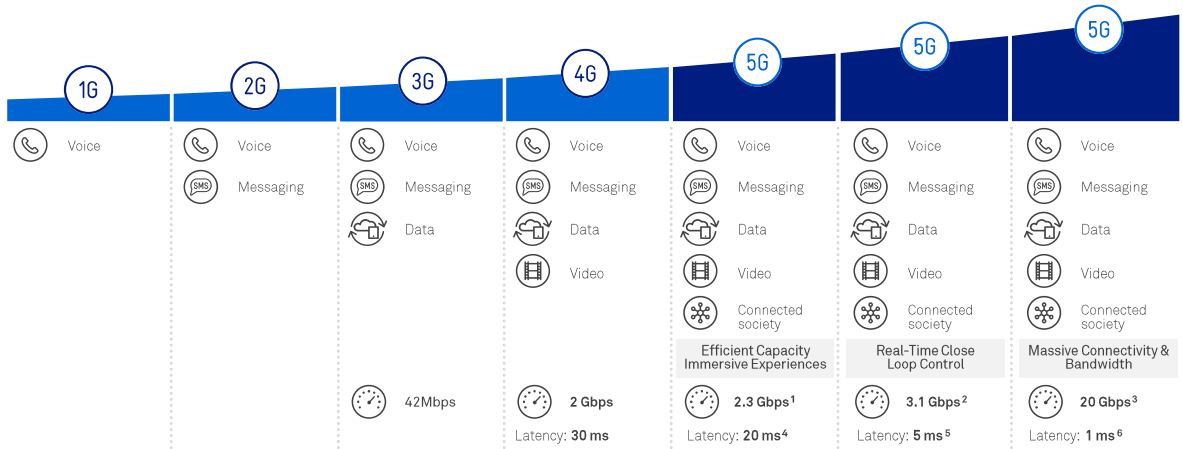## Around
3 million² kms

of Cat M1 coverage

Over
3.5 million² kms

of NB IoT coverage

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The road to 5G

1G	2G	3G	4G	5G	5G	5G
Voice	Voice	Voice	Voice	Voice	Voice	Voice
	Messaging	Messaging	Messaging	Messaging	Messaging	Messaging
		Data	Data	Data	Data	Data
			Video	Video	Video	Video
				Connected society	Connected society	Connected society
				Efficient Capacity Immersive Experiences	Real-Time Close Loop Control	Massive Connectivity & Bandwidth
		42Mbps	2 Gbps	2.3 Gbps[1]	3.1 Gbps[2]	20 Gbps[3]
			Latency: 30 ms	Latency: 20 ms[4]	Latency: 5 ms[5]	Latency: 1 ms[6]

1. First generation handset peak speed **2.** Second generation handset peak speed **3.** Mm-Wave & compatible device **4.** 5G Non-standalone mode **5.** 5G Non-standalone mode with latency reduction features & sub-regionalisation of packet core under NE2020 **6.** Standalone + Non-Standalone Mode

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Where 5G can go that 4G cannot

Spectrum
25X

Speed
10X

Capacity
10X

Latency
1/30th
of current ping times
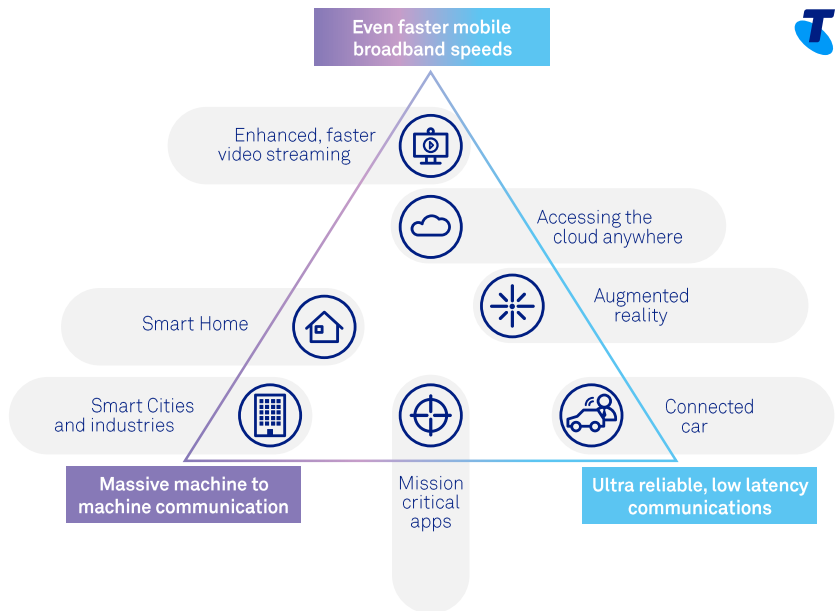
Scale
10X
# connected devices

Capacity unit costs
↓

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Key enablers of 5G

Beam-forming
1 Increased capacity efficiency

Multi-user MIMO
Array Antenna
2 Enhanced propagation & increased capacity

Wider channel bandwidths
3
20MHz Carrier
1000MHz Carrier
Increased throughput capacity

Automation
4 Self-optimising networks & network elasticity

Network Function Virtualisation (NFV)
5 Supports network slicing & automation, operational agility

Software Defined Networking (SDN)
6 Dynamic traffic routing enables network programmability

Distributed core
7 Increases flexibility & resiliency & enables lower latency

Network slicing
8 Supports different SLAs & access (fixed/mobile) convergence

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5G
is more than just **speed**

Even faster mobile broadband speeds
Enhanced, faster video streaming
Accessing the cloud anywhere
Smart Home
Augmented reality
Smart Cities and industries
Connected car
Massive machine to machine communication
Mission critical apps
Ultra reliable, low latency communications

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Rapid growth in data usage is offset by improved network efficiency and unit costs

Mobile product unit cost per GB; Mobile traffic growth

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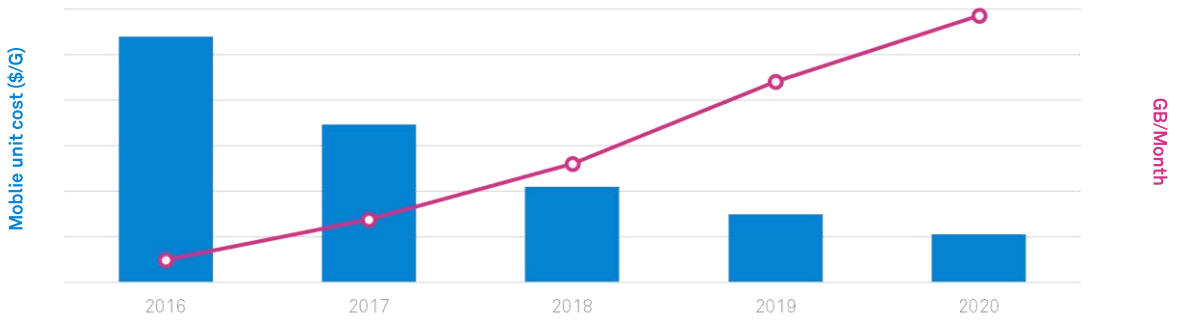
We are globally aligned in exploring leading 5G use cases

Page 20
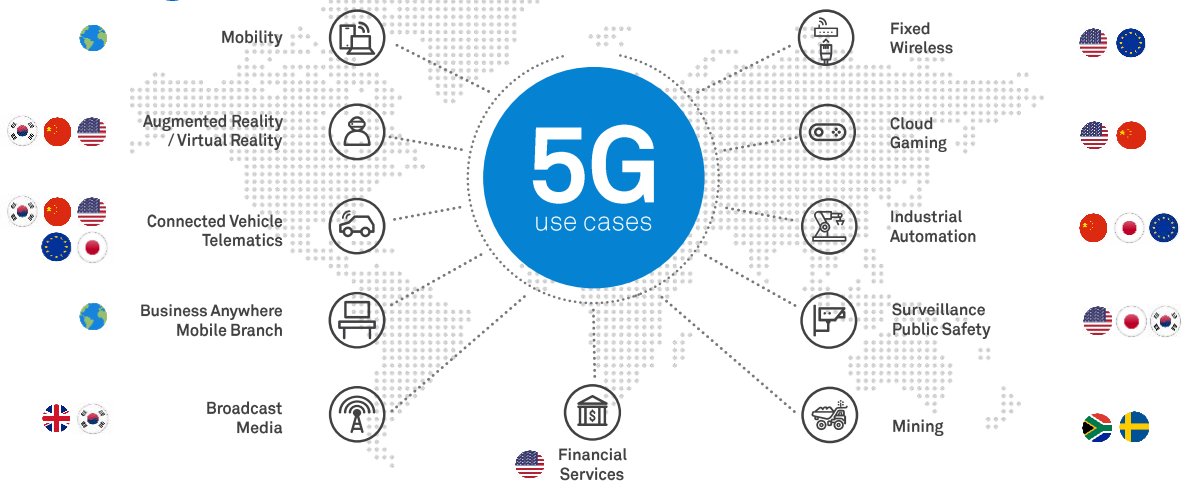
Beyond our initial network readiness in 2018, we are scaling our network and introducing new capabilities
Subject to outcome of the 3.6 GHz auction

2018	2019	2020	2021

First to market → Scale up →

3.6 GHz Auction

Low-band refarming

26 GHz Auction

200 sites → Site Builds

First Network Ready Sites

Next Generation 5G Core

1st Gen Chipset Devices → 2nd Gen Chipset Devices

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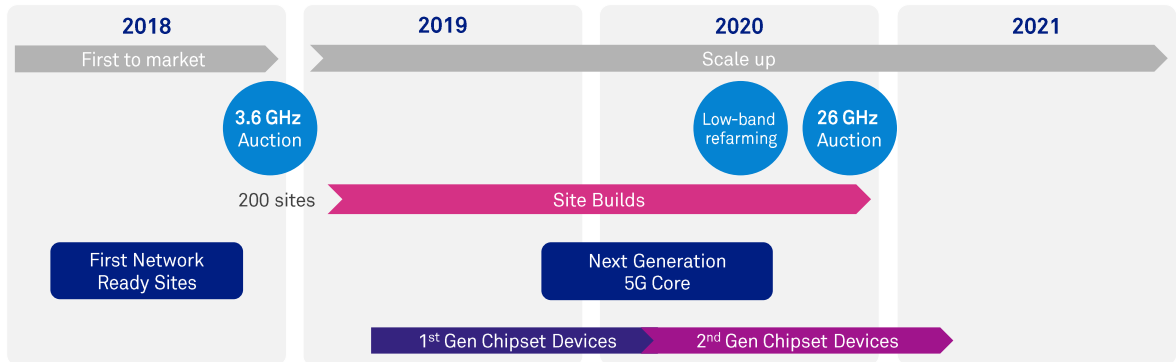
Australia's 5G bands are well aligned with key global markets

	High band (Mm-Wave)	Mid band	Low band (still emerging)
🇦🇺	24.25 – 27.5 GHz / 27.5 – 29.5 GHz	3.4 – 3.7 GHz	850 MHz
🇺🇸	24.25 – 24.45 GHz / 24.75 – 25.25 GHz	3.55 – 3.7 GHz *unlicensed / shared* / 3.7 – 4.2 GHz	600 MHz / 850 MHz
🇨🇳	24.5 – 27.5 GHz	3.3 – 3.6 GHz	TBA
🇯🇵	27.5 – 29.5 GHz	3.6 – 4.2 GHz	TBA
🇰🇷	26.5 – 29.5 GHz	3.4 – 3.7 GHz	TBA
🇪🇺	24.5 – 27.5 GHz	3.4 – 3.8 GHz	700 MHz

■ licensed   ■ unlicensed / shared

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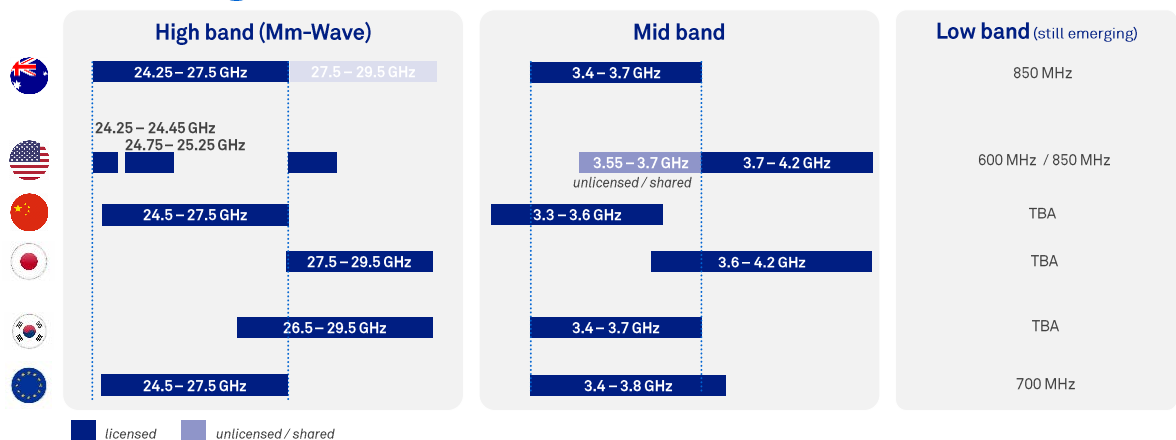
Fixed wireless broadband use cases

Numerous models for wireless broadband today:

- Home wireless broadband on 4G, NBN fixed wireless

5G offers increased opportunity given the increase in capacity and performance:

- 10x capacity than 4G
- Ultra low latency – 1/30th of current ping times

A number of elements are needed to do fixed wireless at scale:

- mmWave spectrum for capacity
- Small cells with fibre connectivity
- Customer premise equipment and aerials on home

The technology is continuing to evolve:

- We have multiple trials underway
- Product proposition and customer experience

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Telstra's IoT capability will become even stronger with 5G

Over 4G

Cat M1
Logistics
Smart cities
Asset tracking

Cat M1
<1 Mbps

Narrow Band-IoT
Utility metering
Industrial sensors
Agricultural monitoring

Cat NB-1
< 200 Kpbs

Over 5G

Mass IoT & Mission Critical Services
Autonomous Vehicles, Drones, Telehealth

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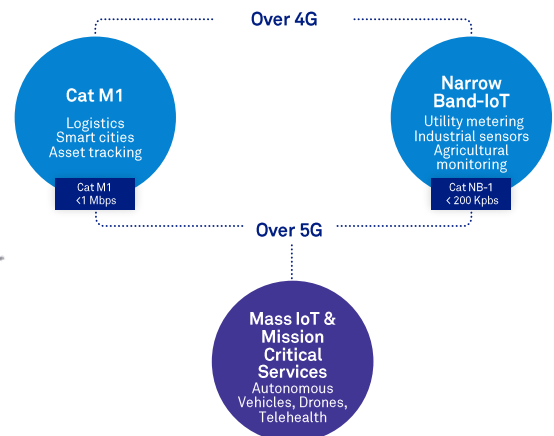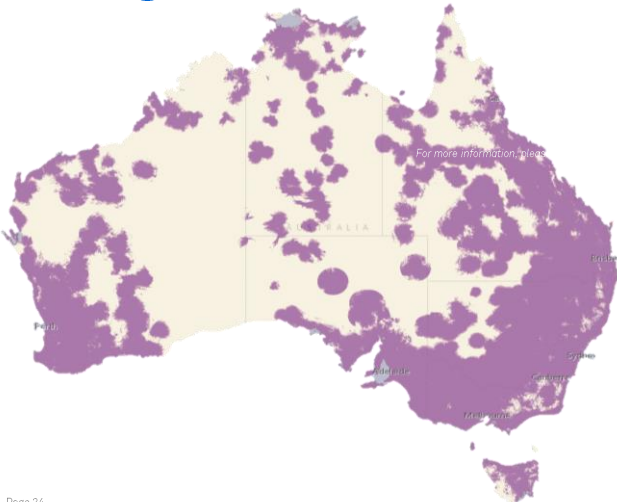
Bringing 5G to life for consumers & small businesses

Michael Ackland
Group Executive, Consumer and Small Business

Immediate benefits for consumers and small businesses

5G experiences and propositions

- 5G improves experience on 4G
- 5G reinforces our leading propositions

Mobile handsets

- 5G chipsets significantly improve received speeds
- On sale in 1H 2019

Mobile broadband devices

- Ultra high speeds for 'on-the-go' applications
- On sale in 1H 2019

Quality of Service

- Differentiated products based on tiered levels of service

5G devices will be the first step towards enabling a range of new capabilities

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First to market with 5G devices

Immediate benefits for consumers and small businesses

5G experiences and propositions

- 5G improves experience on 4G
- 5G reinforces our leading propositions

Mobile handsets

- 5G chipsets significantly improve received speeds
- Commercial launch in 1H 2019

Mobile broadband devices

- Ultra high speeds for 'on-the-go' applications
- Commercial launch in 1H 2019

Quality of Service

- Differentiated products based on tiered levels of service

5G devices will be the first step towards enabling a range of new capabilities

Planning for future 5G use cases

Emerging 5G-enabled use cases

Consumers

Gaming and e-sports
> Cloud-based gameplay on mobile or fixed broadband

Immersive video
> HD on-demand video across social, web and applications

Small businesses
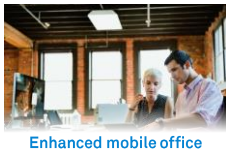
Enhanced mobile office
> Mobile office with access to cloud-based solutions on 5G
>
> Wireless HD CCTV monitoring and security

Page 29
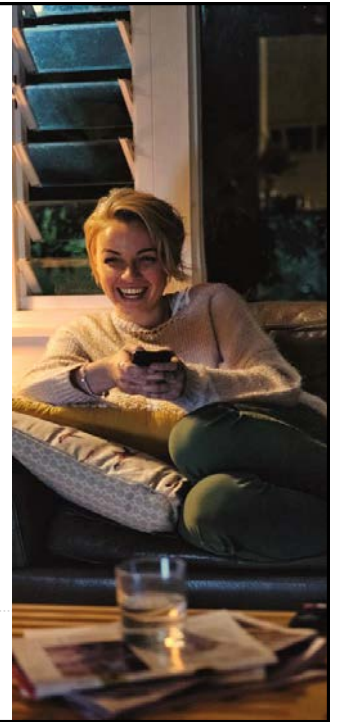
The future of gaming and e-sports, enabled by our leading 5G network

> Industry shift to cloud-based gaming for casual and professional players

> 2.5 million gaming customers at Telstra already

> 5G will enable an immersive, ultra-responsive experience across multiple devices

Cloud ← → Edge ← → Connectivity ← → Gaming devices

Apps
Platforms
Media

Page 30
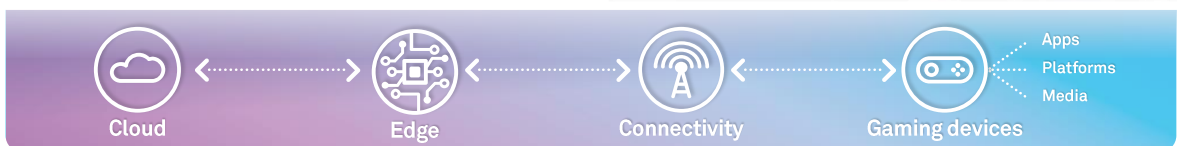
Realising value through 5G connectivity, devices and use cases

❶ 5G Connectivity	❷ 5G Devices	❸ 5G Use Cases
		• Differentiated connectivity and service for each use case
		• Access to applications and services
		Value realised through new use cases
	• Access to leading, mobile, media and gaming devices	
	Value realised through offering the best devices	
• Enhancing our core connectivity offers with 5G		
Value realised through the best network		

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Creating Enterprise value with 5G

Michael Ebeid AM
Group Executive, Enterprise

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Innovative 5G use cases

Indicative timeframe to market and revenue opportunity

Nature of Revenue Opportunity
- Incremental Revenue
- Retained Revenue

Revenue Opportunity for Telstra — High / Low

- Enhanced Mobile Broadband
- Office of the Future
- Mobile Branch
- Enhanced Stadium Experience[1]
- Always On[2]
- Education and Training AR/VR
- Office of the Future
- Real Time Medical Imaging
- Smart Cities
- Enhanced Vehicle Platooning
- Immersive Tele Remote Operation
- Media Infrastructure Substitution
- Enhanced Connected Autonomous Vehicle
- IoT Autonomous Manufacturing
- IoT Autonomous Cities

Timeframe

4G/4GX + 5G 'lite' (FY19/FY20) ···· Step change speed become available ···· 5G (FY21-22) ···· Massive IoT and ultra low latency become available ···· 5G (FY23+)

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Use cases enhancing industries

Cross industry use cases:
Enhanced speed and bandwidth

Industry use cases:
High speed and bandwidth and low latency

Mobile Branch	Media Infrastructure Substitution	Enhanced Stadium & VR Experience	Smart Cities	Enhanced Vehicle Platooning	Immersive Tele Remote Operation
Retail & Banking	Broadcast	Broadcast & Sport	Local Government & Corporates	Logistics & Mining	Mining
• Light infrastructure/ personnel branch mobilisation to reduce set-up and operating costs	• Satellite infrastructure and outside broadcast trucks no longer required	• Cameras to capture advanced volumetric data. Analysis, reconstruction, compression and encoding to enhance the broadcast experience	• Multi connected HD video surveillance and real-time facial recognition security to improve surveillance	• Low latency access to high data rate feeds from roadside infrastructure to improve safety and efficiency	• 360 degree HD video, low latency haptic control and remote control of assets underground to improve efficiency

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5G adoption across mining operations

More accessible spectrum

- New mid and high band options
- New radio frequencies provide increased propagation compared to a similar LTE bands

Higher data rates at cell edge

- Removes the need for infill trailers
- Fewer cell sites inside high risk areas

Higher density sensor deployments

- Low power sensors on everything
- 100K+ connections
- Sensors on conveyor rollers, air quality and seismic sensors in the walls of underground drives

Higher density heavy vehicle platooning

- Allows for use of smaller, cheaper trucks
- Reduce error margins between vehicle placement
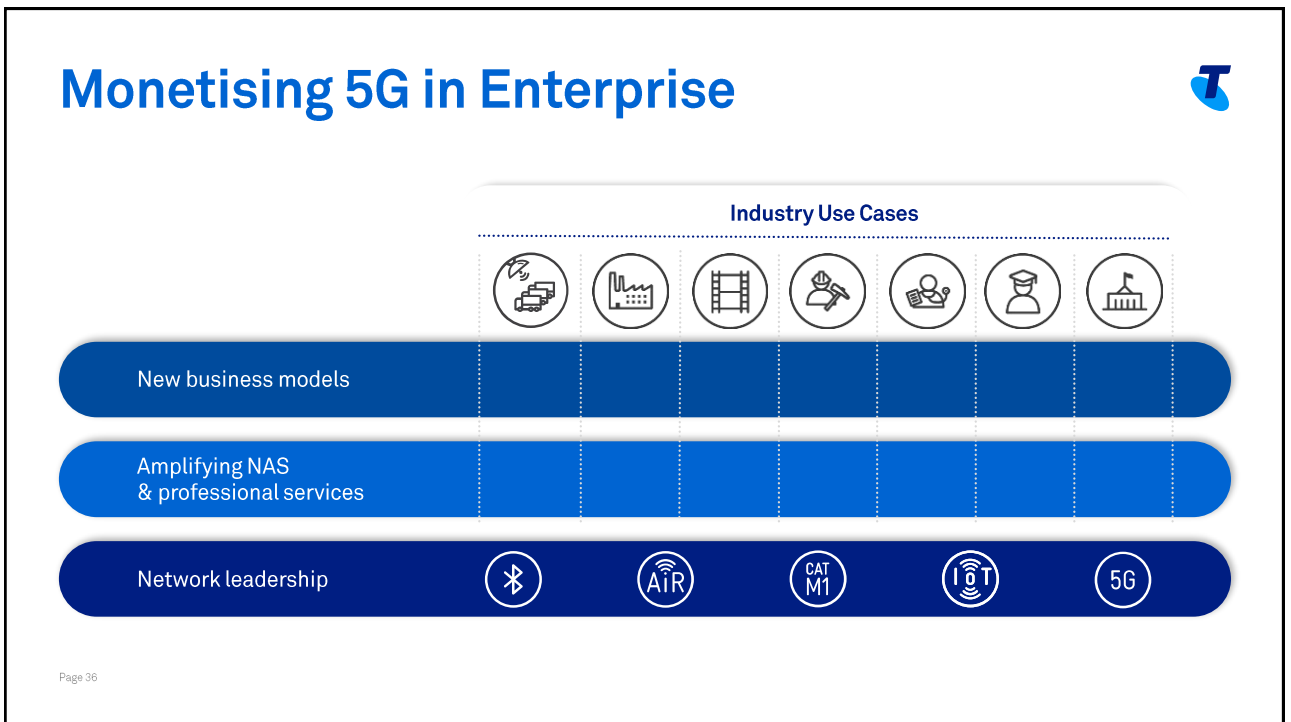
High capacity infill solutions for drill pads

- Supports high volume video traffic into the network
- Capacity for additional throughput

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Monetising 5G in Enterprise

Industry Use Cases

New business models

Amplifying NAS & professional services
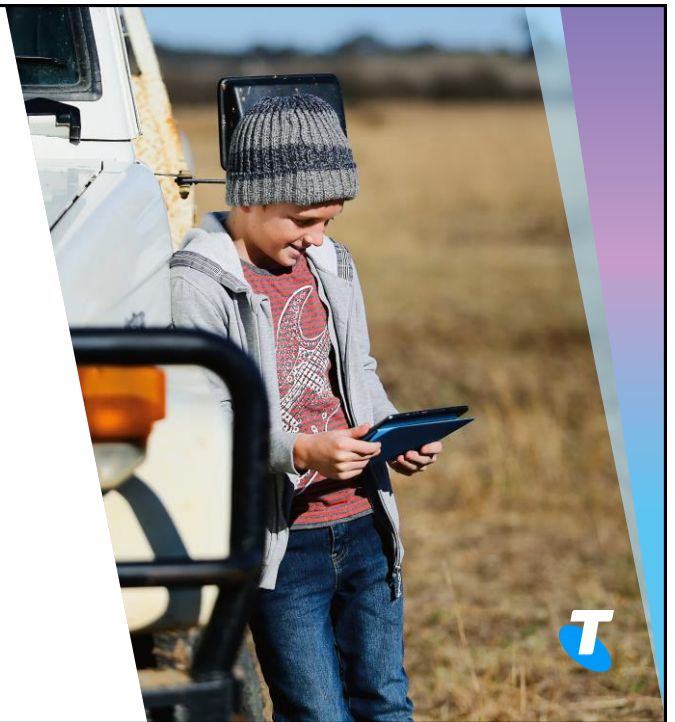
Network leadership

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Future opportunities in 5G

Christian von Reventlow
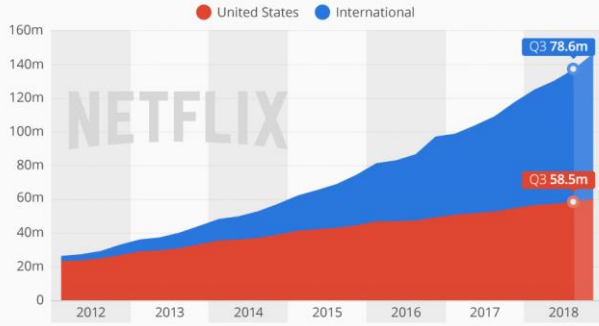Group Executive, Product & Technology

What do customers expect the future to be?

Media on the Go

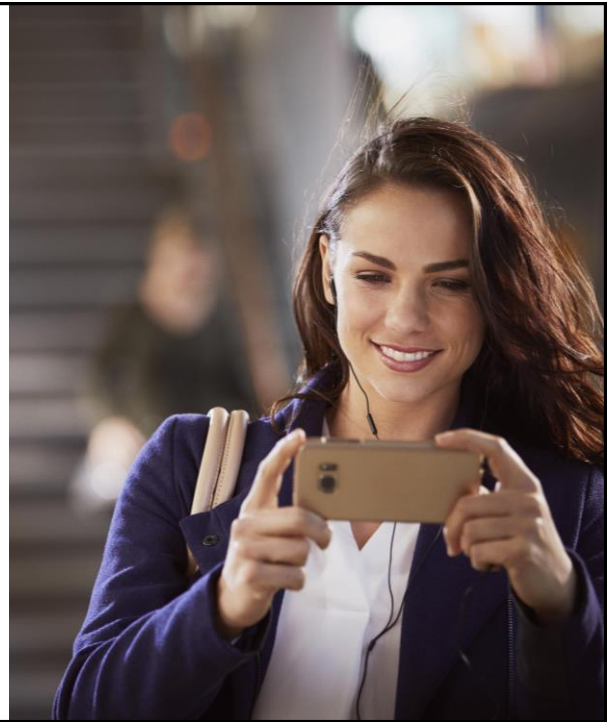**Netflix Continues to Grow Internationally**
Netflix's worldwide streaming subscribers at the end of the respective period*

● United States ● International

Q3 **78.6m**

Q3 **58.5m**

NETFLIX

160m
140m
120m
100m
80m
60m
40m
20m
0

2012 2013 2014 2015 2016 2017 2018

* Q4 2018 figures as forecast by Netflix in October 2018
@StatistaCharts Source: Netflix

statista

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Game Streaming

Twitch Streaming Hours

18MM

12MM

6MM

0

Average Daily Streaming Hours, Global

2012 2013 2014 2015 2016 2017
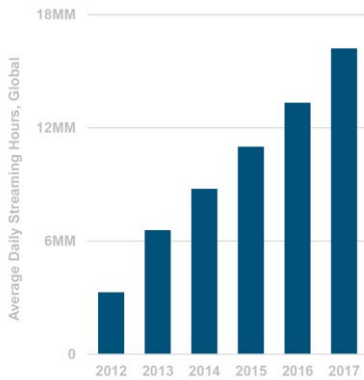
Source: Kleiner Perkins Internet Trends 2018

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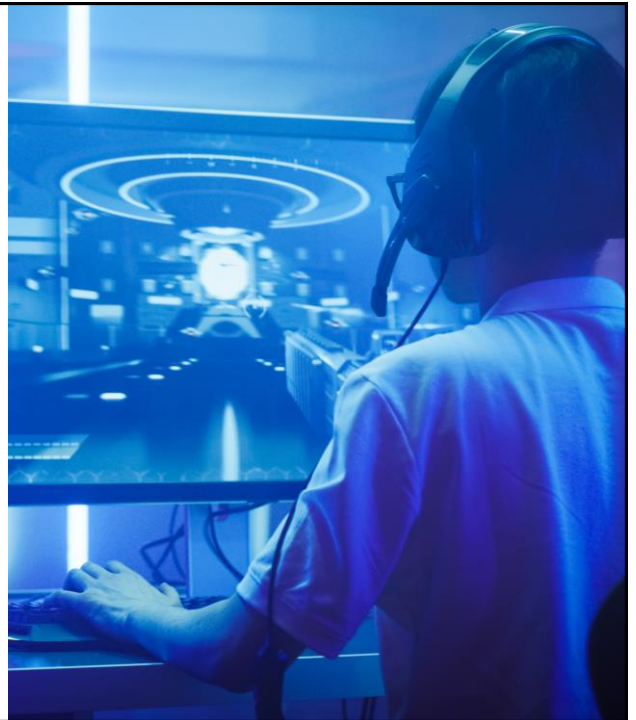
Augmented Reality
The Digital-Real-World

Age of Pokemon Go player

- 13 to 17
- 18 to 34
- 35 and older
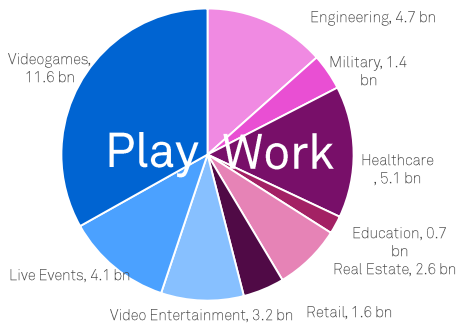
3%
14%
83%
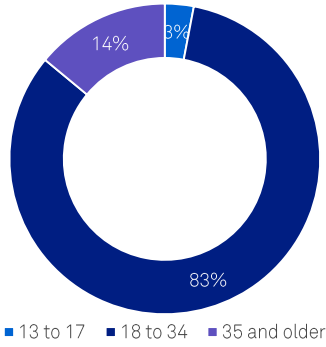
Source: MFour (July 2016)

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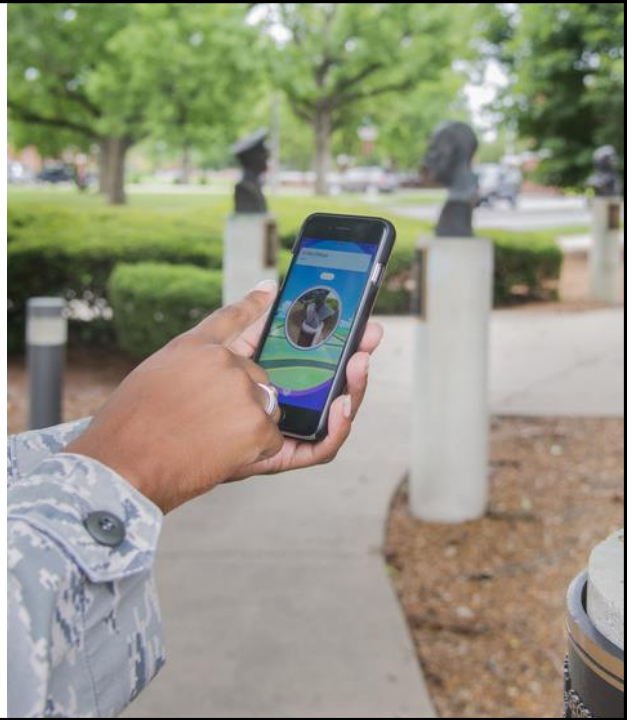
Augmented and Virtual Reality
Entertainment & Connected Workers

AR/VR Market in 2025

Videogames, 11.6 bn
Engineering, 4.7 bn
Military, 1.4 bn
Healthcare, 5.1 bn
Education, 0.7 bn
Real Estate, 2.6 bn
Retail, 1.6 bn
Video Entertainment, 3.2 bn
Live Events, 4.1 bn

Play   Work

Source: Goldman Sachs Equity Research (2016)

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Augmented Reality
Smartphone replacement

76% of Generation Z expect to wear contact lenses that can take pictures

Source: DT/Cognizant Study (270 people)

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Image Credit: sndrv https://www.flickr.com/photos/sndrv/4487480742/

Connected and Automated Driving
4 trends for disruption

Electrification	Desirable products
	Battery tech Charging stations
	Efficiency Regulation

Connectivity	Connected lifestyle extends to the car
	V2V Policy 5G Networks
	Last piece to be connected by tech giants

Autonomous	Sensor and processing solutions
	Legal infrastructure Public demos
	Tech giants interest leading

Diverse Mobility	Access over ownership
	Smartphone scheduling Congestion reduction
	Trendy products, government incentives

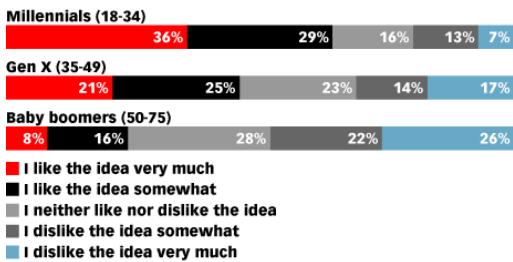Source: McKinsey "Automotive revolution" (2016)

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Drones

US Internet Users' Primary Attitude Toward Drone Delivery Services, by Generation, June 2016
% of respondents

Millennials (18-34)
36% | 29% | 16% | 13% | 7%

Gen X (35-49)
21% | 25% | 23% | 14% | 17%

Baby boomers (50-75)
8% | 16% | 28% | 22% | 26%

■ I like the idea very much
■ I like the idea somewhat
■ I neither like nor dislike the idea
■ I dislike the idea somewhat
■ I dislike the idea very much

Note: millennials n=392; Gen X n=326; baby boomers n=489; numbers may not add up to 100% due to rounding
Source: United States Postal Service (USPS), "Public Perception of Drone Delivery in the United States," Oct 11, 2016
218484   www.**eMarketer**.com
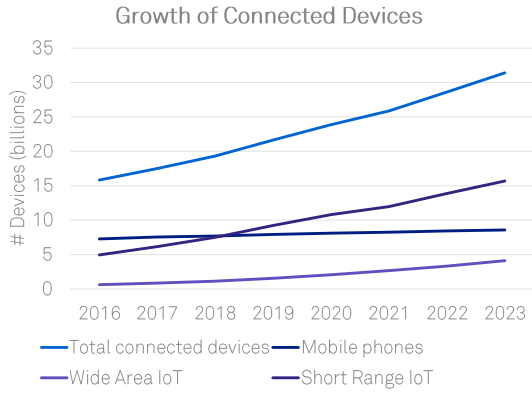
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Consumer Robotics

75% of Generation Z expect to own a robot as a personal butler

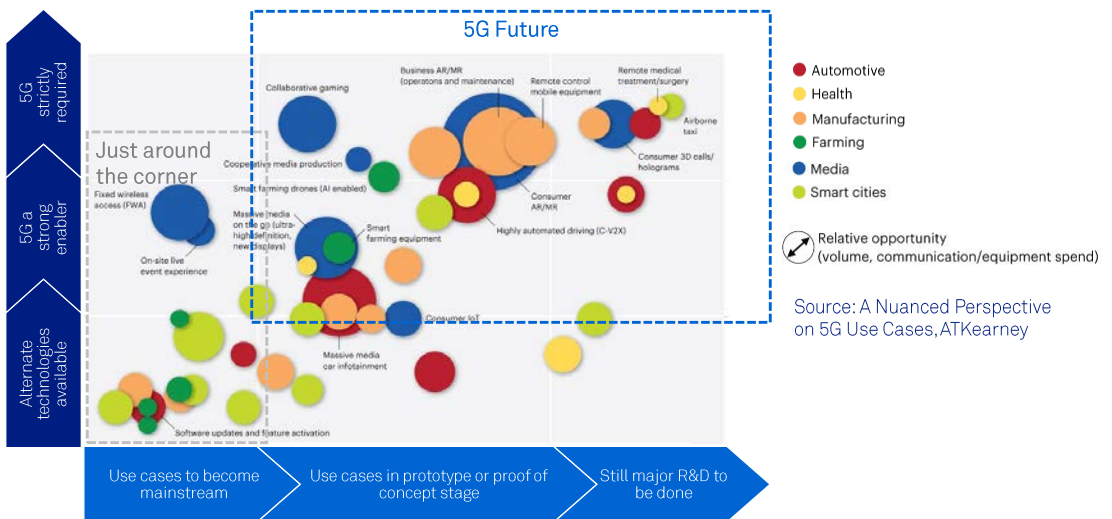Source: DT/Cognizant Study (270 people)

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Intelligent Environment

Growth of Connected Devices

- Total connected devices
- Mobile phones
- Wide Area IoT
- Short Range IoT

Source: Ericsson Mobility Report (June 2018)

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5G – A technology for the next decade

5G Future

- Automotive
- Health
- Manufacturing
- Farming
- Media
- Smart cities

Relative opportunity
(volume, communication/equipment spend)

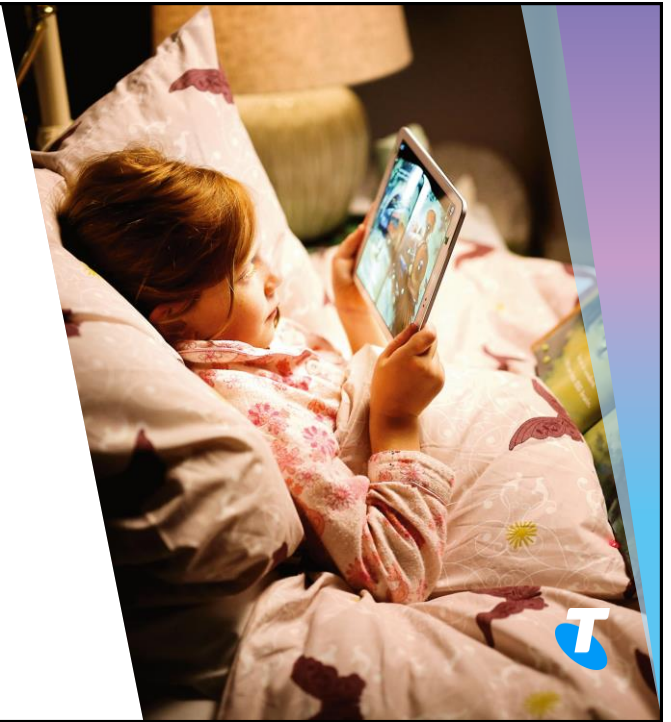Source: A Nuanced Perspective
on 5G Use Cases, ATKearney

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There will be business

- Telcos are ideally positioned for the future world

- Telstra is investing for the short and long term on 5G

- Technologists and customers are aligned

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Q&A