

IN THE MATTER of the Resource Management Act 1991

AND

IN THE MATTER of Variation 2 to the Second Generation
Dunedin City District Plan

JOINT STATEMENT OF EVIDENCE OF

GRAEME IAN MCCARRISON FOR

SPARK TRADING NEW ZEALAND LTD

AND

COLIN CLUNE FOR

VODAFONE NEW ZEALAND LTD

IN RELATION TO VARIATION 2 TO THE SECOND GENERATION

DUNEDIN CITY DISTRICT PLAN

3 SEPTEMBER 2021

1. EXECUTIVE SUMMARY

- 1.1 Spark, and Vodafone, along with other telecommunication providers, invest significantly every year in our networks to ensure New Zealanders have access to world class digital services.
- 1.2 To enable this, we rely on regulatory frameworks both nationally, via the National Environmental Standards for Telecommunications Facilities 2016 (NESTF), and locally, via the Operative and Dunedin Proposed District Plan (Proposed Plan), to appropriately enable the planning and funding for upgrading of existing networks and construction of new networks to support new growth areas.
- 1.3 Our network requirements are constantly changing and evolving unlike any other infrastructure sector, as reflected in the fact that we commenced rolling out the new 5G network in 2020 at the same time as completing the 4G network. New Zealanders and businesses completely depend on access to these networks, as proven during the current Covid-19 pandemic and resultant economic crisis.
- 1.4 The key focus of our evidence is:
- a. Introduce the telecommunications industry and the companies we represent.
 - b. Consultation and engagement with the telecommunication companies.
 - c. Explanation of the impact of intensification and building exceeding the height standards.
 - d. Background to telecommunication connections.
- 1.5 Spark and Vodafone are national network operators and work collaboratively on district plan reviews in an attempt to provide a nationally consistent approach to district plan matters. Customer choice in connectivity to a telecommunication network is essential and can be via wireless and/or fixed line. Our concern is that Variation 2 regulates the provision of fixed line only as a solution to for connectivity¹. Provision of fibre network is important as promoted by the Crown Infrastructure Partners managed Ultra-Fast Broadband project.
- 1.6 Our submission requested strengthening of the obligation to recognise telecommunication networks and require engagement. To achieve development that is integrated with both infrastructure planning and funding decisions. Secondly, the requirement to undertake an assessment impact on adjacent infrastructure, such as

¹ Acknowledging that this issue is being addressed in the s42A report for 3-waters

cell sites, when considering a building height infringement. The NPS-UD requires local authorities with additional infrastructure to achieve integrated land use and infrastructure planning, but it is not clear to Spark and Vodafone how this will occur going forward as development in the growth areas is planned and construction commences. We support the use of the Transition Overlay Zone process that enables future land for residential, industrial land to be identified as appropriate for growth and where infrastructure servicing has not been planned. This land can be transitioned when infrastructure is available.

- 1.7 What Spark and Vodafone are seeking is an operational procedure to ensure telecommunications networks are engaged with in regard to the release of further urban land so they can identify any constraints and plan for what is required. There would be no particular performance criteria to meet other than to certify that the telecommunications network operators and other non-public infrastructure operators such as electivity and gas distribution have been advised. We consider it critical that before land goes from transition status to being considered 'infrastructure ready' for development that the telecommunication network operators and other network utilities have the opportunity to be informed and ideally work collaboratively to enable that the new land is fully serviced all with critical infrastructure.
- 1.8 We recognise and appreciate the open dialogue Council. Jane MacLeod approached Graeme McCarrison in October 2019 with an initial request for feedback on the potential variation proposal to ensure that Dunedin had enough land zoned to meet growth needs over the next 10 years. In July 2020 Council reached out with a formal request to Chorus but not any of the mobile network providers for feedback on any potential concerns or issues to increase the capacity of telecommunication infrastructure in any areas within the city. In response to the shortage of housing within the city following a period of increased growth. Variation 2 as we note has a predominate focus and support for public infrastructure rather recognition that a city relies on all critical infrastructure to function and need the needs of Dunedin's residents and business operators..
- 1.9 Local authorities not considering operators of existing telecommunication sites are being affected by applications for new or existing buildings to infringe permitted height limits. In turn, this can lead to the need to relocate an existing site. For Spark nationally this occurs approximately 4 times a year costing on average \$350,000 per site and between \$1.2 to \$1.5 million. Occasionally the loss of a site leads to

replacement with 2 or more sites to achieve the same coverage footprint as it is increasingly difficult to acquire new locations.

- 1.10 It is recognised that the telecommunication industry is complex and requires involvement of multiple company's local authorities should be proactively working with the industry specially to support all customers to get access to the digital services they demand. The NPS-UD recognises additional infrastructure i.e. telecommunications and electricity to ensure and achieve integrated land use and infrastructure planning for the growth areas.
- 1.11 We have requested that the reference in rule 9.3.7.X to '*ultra-fast fibre*' be replaced with '*telecommunications*'. The Telecommunications Carriers' Forum (**TCF**) in 2010 published non-statutory guidelines for Territorial Authorities on minimum standards for telecommunications infrastructure for new subdivisions. This document, which is under review currently, is neutral on the form of the connection provided to a new lot or premises during subdivision or development. Spark and Vodafone support this approach.

2. INTRODUCTION

Graeme Ian McCarrison

- 2.1 My full name is Graeme Ian McCarrison. I am the Engagement & Planning Manager at Spark New Zealand Trading Limited ("Spark"), a position I have held since February 2015. I am authorised to give this evidence on Spark's behalf.
- 2.2 I hold the qualification of Bachelor of Regional Planning (Honours) from Massey University. I am a full member of the New Zealand Planning Institute and have 36 years' experience in New Zealand and overseas. I have been on the board of the New Zealand Planning Institute ("NZPI") since April 2018. Between 2012 and April 2015 I was the chairperson of the Auckland branch of the New Zealand Planning Institute. In 2016 I was honoured with a NZPI Distinguished Service Award, and I received a best practice award for iwi engagement by NZPI in 2015.
- 2.3 During the last 37 years I have worked in the public sector in Auckland including as Director of Regulatory Services at Papakura District Council, Planning Manager for Waitakere City Council and in the private sector as a self-employed consultant and as a consultant at Murray North Partners. I have worked the last nine years in the telecommunications sector. Prior to Spark I held the equivalent position at Chorus NZ Limited ("Chorus") (November 2011 to January 2015), where I advised both Chorus and Spark on resource management and government matters. I am involved in the review of all regional and district plans plus any related local government documents that have the potential to enable or impact the telecommunications industry. During the review of the Christchurch District Plan process, I led and facilitated the combined approach of Spark, Chorus, Vodafone, 2Degrees and Enable during the three years of our involvement.
- 2.4 I facilitate and co-ordinate wide group of network utility organisations with interests in Auckland and nationally. The purpose of this group is to share information, identify opportunities to collaborate and engage on key documents relevant to network utilities. To ensure that the telecommunication industries interests are represented I organise a shared approach and resources that enables Spark, Chorus and Vodafone to be involved at a national level in every relevant Plan review across New Zealand and relevant legislation which includes a submission on the Natural and Built Environments Act exposure draft. This currently comprises involvement in 29 plan reviews including: Dunedin, Queenstown, Porirua, Timaru, Selwyn, Wellington City, Waimakariri, Napier, Nelson, New Plymouth, Waikato, Far North, and Central Hawkes Bay.

- 2.5 I represented the Telecommunications Forum (TCF) on the Technical Advisory Group for the NESTF alongside my colleagues Andrew Kantor – Chorus, Colin Clune – Vodafone, and Ben Blakemore – 2degrees. Since the NESTF 2016 amendments, the group made up of representatives from the Ministry of Business, Innovation and Employment ("MBIE"), Ministry for the Environment ("MfE"), and Local Government New Zealand ("LGNZ") meet at least annually to discuss and review the effectiveness of the NESTF.

Colin William Clune

- 2.6 My full name is Colin William Clune. I am the Resource Management Planning Advisor at Vodafone New Zealand Limited (Vodafone). A position I have held since October 2014. Previously, I was an in-house contractor for Vodafone, (September 2010 to September 2014), where I advised Vodafone on resource management and government matters. I am authorised to give this evidence on Vodafone's behalf.
- 2.7 I hold the qualifications of Bachelor of Urban Planning and Master of Planning from the University of Auckland. Currently I am on the Technical Advisory Group for the National Environmental Standard Telecommunication Facilities amendments (NESTF amendments). A participating member of the New Zealand Telecommunications Forum. Working to efficiently resolve regulatory, technical and policy issues associated with network telecommunications.
- 2.8 I am currently on the Technical Advisory Group for the National Environmental Standard Telecommunication Facilities amendments (NESTF). I am also a participating member of the New Zealand Telecommunications Forum, working to efficiently resolve regulatory, technical and policy issues associated with network telecommunications.

Scope of evidence

- 2.9 This statement of evidence will:
- a. Introduce the telecommunications industry and the companies we represent.
 - b. Engagement with the telecommunication companies
 - c. Explanation of the impact of intensification and building exceeding the height standards.
 - d. Background to telecommunication connections

3. CONTEXT

Telecommunications industry

- 3.1 Telecommunications infrastructure is critical and essential to a modern economy and connecting the ‘system of systems’ that supports New Zealand’s economy and wellbeing of people and communities.
- 3.2 The Infrastructure Commission’s discussion document on Infrastructure for a Better Future recognises the critical nature of telecommunications infrastructure. The report notes that ‘Increasing reliance on communications makes telecommunications infrastructure more critical.’²
- 3.3 Telecommunications plays a vital and important role in national resilience, demonstrated most recently through our national response to Covid-19, as recognised by the Infrastructure Commission: ‘The Covid-19 pandemic is a reminder of the importance of a resilient, flexible and agile infrastructure system, as demonstrated, for instance, in the move to working from home, where telecommunications infrastructure has become a substitute for physical transport infrastructure.’³
- 3.4 Our wireless telecommunications networks enable the provision of Emergency Mobile Alerts by the National Emergency Management Agency. These are messages about emergencies sent by authorised emergency agencies to capable mobile phones. The alerts are designed to keep people safe and are broadcast to all capable phones from cell towers within the emergency area. The alerts have been used numerous times for local and national emergencies, including nationwide alerts for the Covid-19 pandemic, and just a few weeks ago flood event warnings to potentially affected people in Nelson, Marlborough and Westport areas. The alerts are increasingly becoming the way by which nationally significant events and information are communicated to New Zealanders in an immediate and succinct manner.
- 3.5 Telecommunications infrastructure is a key enabler of future technologies that are expected to be one of the solutions to many of today’s challenges, from climate change to lifting our productivity and innovation. It is also a key enabler of better use of other types of existing infrastructure and will support efficient deployment of new infrastructure. Telecommunications infrastructure could be considered the high-performing invisible infrastructure that underlines other sectors as the conduit to enabling connection, and the ever-increasing expansion of the Internet of Things (IoT). For example, digital infrastructure supports applications and process

² <https://www.infrastructure.govt.nz/assets/Uploads/Infrastructure-Strategy-Consultation-Document-June-2021.pdf>; p. 34

³ <https://www.infrastructure.govt.nz/assets/Uploads/Infrastructure-Strategy-Consultation-Document-June-2021.pdf>; p. 37

improvements that will assist New Zealand in meeting its climate change goals. The Climate Change Commission's final advice to the government for its emissions reduction plan notes precision agriculture as an example of the ways in which technology will help to improve efficiency and reduce environmental impacts in agriculture – it requires digital connectivity and networks to be possible⁴.

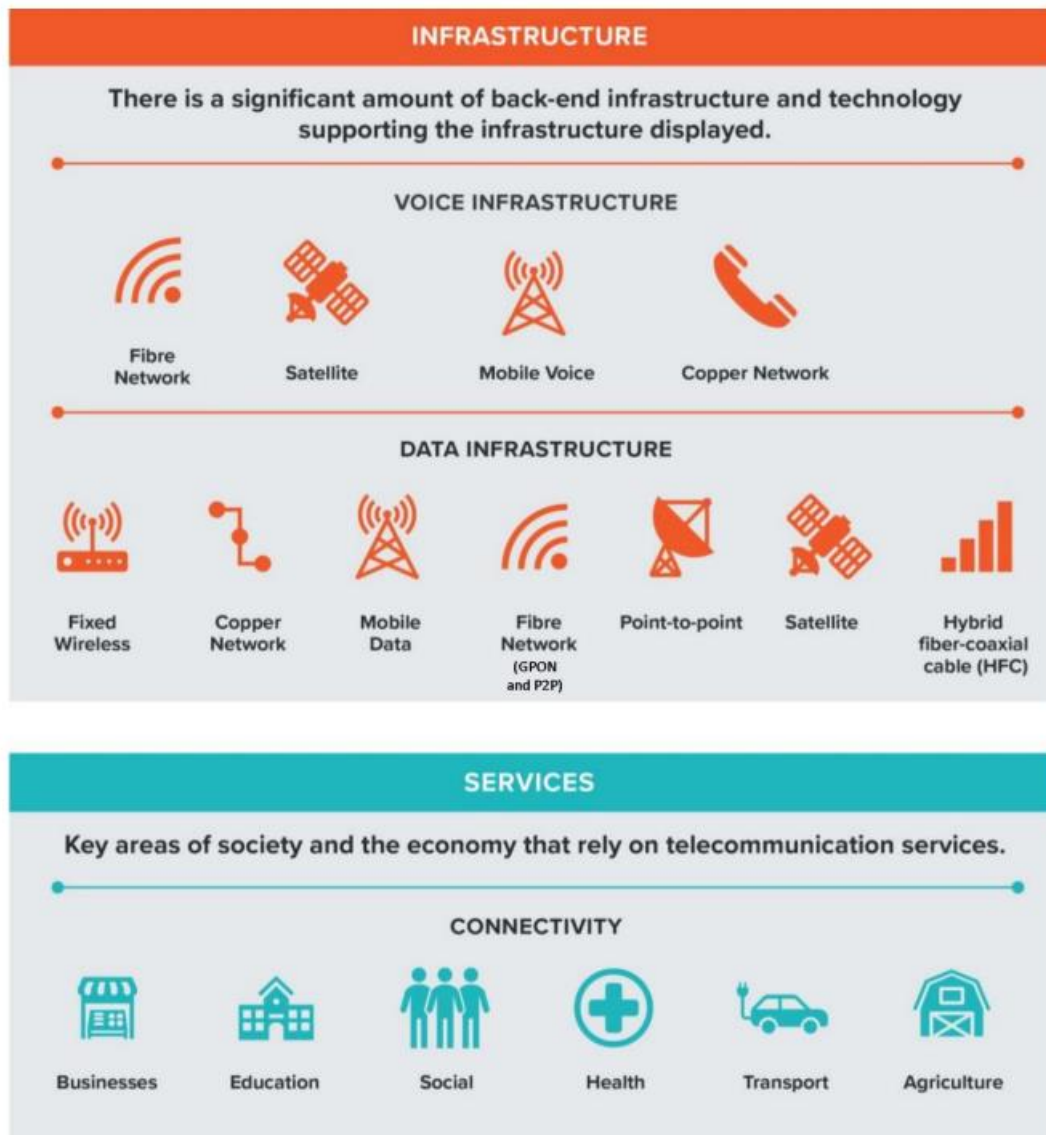
- 3.6 A recent report by Carbon Trust, commissioned by Vodafone Group, shows the potential for carbon emissions cuts fuelled by hybrid working, using technology to reduce lengthy commutes and large office spaces, and deliver other societal benefits such as the potential for more efficient use of existing infrastructure stock⁵.
- 3.7 The rollout of 5G and digital technology that it enables is critical to a well-functioning urban environment as it is widely expected to transform our cities and the ways in which we use other types of infrastructure⁶. 5G creates new opportunities to collect and compute all sorts of vehicle data in real time, as well as exchange that information with other devices on the journey. This could soon mean we have roads that can intelligently adapt, increasing car flow during rush hour and accommodating more cyclists and pedestrians during quieter times, as well as smart traffic lights that will ease congestion. It will play an important role as an input to network demand management tools like congestion charging.
- 3.8 The telecommunications services that are relied on by many areas of society and the economy are provided via a number of different types of infrastructure and technologies, as illustrated by New Zealand Infrastructure Commission, State of Play: Telecommunications discussion document December 2020⁷ below

⁴ <https://ccc-production-media.s3.ap-southeast-2.amazonaws.com/public/Inaia-tonu-nei-a-low-emissions-future-for-Aotearoa/Inaia-tonu-nei-a-low-emissions-future-for-Aotearoa.pdf>; p. 306

⁵ <https://www.nzherald.co.nz/sponsored-stories/83-million-ways-to-help-climate/NOMMPKDLWFJMF4G74LQDXU2KUU/>

⁶ <https://www.5gradar.com/features/what-is-5g-these-use-cases-reveal-all>

⁷ <https://infracom.govt.nz/assets/Uploads/Telecommunications-State-of-Play-December-2020.pdf> Source: New Zealand Infrastructure Commission, Te Waihangā and TC



Source: New Zealand Infrastructure Commission, Te Waihanga and TCF

- 3.9 Telecommunication network operators need district plan provisions that provide flexibility to design the network to meet our requirements for coverage and those of a developer we can plan locations for key infrastructure, including things like street cabinets, antennas and masts and place them in locations which will have the minimum impact on residents and are mindful of the visual impact. It is far more efficient to identify the network requirements and opportunities during the planning and designed phase and install them during the initial build rather than trying to retrospectively add them later. Adding fixed network later increases costs, requiring network operators to dig up roads and private driveways and causes significant disruption.
- 3.10 Providing high quality connectivity and services to homes and businesses throughout New Zealand can be challenging. Rapid advances in technology are driving

transformational changes as our products and services become increasingly important in the daily lives and businesses of New Zealanders. These advances have seen the telecommunications industry collectively investing \$1.6 billion each year on average to deliver new services and network technology to New Zealanders. At the same time, fierce competition is delivering more value to consumers at lower prices, meaning New Zealand is now in the enviable position of having world-class networks and services, at below OECD average prices, for both fixed and mobile communications.

- 3.11 In mobile services, Spark, Vodafone and 2degrees are the three major mobile network operators who each compete for customers over their own network of cell sites, utilising radio spectrum licensed from the Government. Sometimes we co-locate our electronic equipment on another operator's facility, to save the cost of building a separate facility. Additionally, Spark, Vodafone and 2degrees established and jointly own Rural Connectivity Group ("**RCG**") to share a wireless network that will provide wireless coverage under a programme to extend mobile and wireless broadband coverage to remote areas of rural New Zealand as part of the Government's Rural Broadband Initiative.
- 3.12 When it comes to fixed services provided over fibre lines, the industry structure is quite different. The local line networks (sometimes referred to as the "last mile") are owned by wholesale companies such Chorus, Enable and Ultra-Fast Fibre which must be separate from the retailers like Spark, and Vodafone that provide services to customers.
- 3.13 Telecommunications is a regulated industry sector in New Zealand, with the Commerce Commission overseeing the industry. As part of this regulation, telecommunications companies are required to pay an annual Telecommunications Development Levy, which is used to improve New Zealand's telecommunications infrastructure.

Spark

- 3.14 Spark is New Zealand's largest digital services company delivering mobile, fixed and IT products and services to millions of New Zealand consumers and businesses. Our vision for New Zealand is 'To help all of New Zealand win big in a digital world'.
- 3.15 Spark is a multi-brand business, with principal brands Spark (supporting home, consumer mobile and small business customers) and Spark Digital (supporting government and business customers with strong Cloud services, mobility and

Information and Communication Technologies ("ICT") capabilities). Specialist and flanking brands include Skinny (consumer mobile and broadband), Revera and CCL (data hosting services), Digital Island (business telecommunications), Lightbox (internet TV), Qrious (data analytics), and Bigpipe (consumer broadband). Spark has transformed the way New Zealanders view sport with the introduction of Spark Sport streaming platform.

- 3.16 Fully privatised since 1990, Spark is listed on the NZX and ASX stock exchanges. Spark New Zealand contributes significantly to the community via the Spark Foundation, whose activities included the establishment of Givealittle (now sold), New Zealand's first 'zero-fees' online crowdfunding platform through which generous New Zealanders donate millions of dollars annually to thousands of charities and deserving causes. Spark Jump offers heavily subsidised broadband to families with school-aged children who cannot afford commercial broadband. Spark also supports a range of other education-focused initiatives by partnering with national not-for-profit organisations.
- 3.17 Spark is expanding the access to broadband services through Skinny Broadband, a prepaid service, and Wireless Broadband. All these wireless broadband services deliver a fast and reliable internet connection using 4G/4.5G mobile technology instead of a connection using the traditional copper line ADSL network. Spark aims to lead the race to deploy the next generation mobile network 5G technology in New Zealand. The Spark 5G Lab was primarily designed to be a collaboration space for New Zealand innovators, entrepreneurs. The lab showcases some of the possibilities and benefits of 5G such as robotics, virtual reality, facial recognition, IoT, smart cities, emergency services drones and driverless cars.
- 3.18 The New Zealand mobile market is growing. Success in wireless-based products and services is underpinned by our investment in the mobile network. The delivery a 5G network is reliant on the availability of spectrum. We are also replacing the ageing Public Switched Telephone Network ("PSTN") with our new Converged Communications Network ("CCN"), which will enable richer and better customer experiences with voice, video, and collaboration features over whatever Spark service is available at the moment customers want to use it.
- 3.19 Sparks two low-power networks, such as LoRaWAN, with one of these now covering more than 98% of the population. LoRaWAN is a Low-Power, Wide Area ("LPWA") wireless networking protocol for the Internet of Things ("IoT"). LoRaWAN network operates separately to the 4G mobile network. Our IoT capability is enabling a range

of opportunities, such as Smart City Infrastructure, video surveillance, smart wearables, outpatient monitoring including voice and video features, metering, smart lighting and environmental monitoring, connected vehicles and trackers on industrial vehicles to monitor location of packages and condition of vehicles. Several interesting use cases for IoT sensors include in agribusiness to better manage farms, orchards and other agricultural use cases such as beehives. IoT enables businesses to adopt new technology that will give them the data and information they need to make smarter business decisions. Spark continues to provide a paging service network for emergency services such as New Zealand Fire Service, in particular volunteer fire officers in rural areas and health boards and customers for whom paging is also business-critical. The network is being upgraded and expanded for coverage.

Vodafone

- 3.20 Vodafone New Zealand is one of Aotearoa's leading connectivity companies and we offer a range of broadband, mobile and technology products. We are focused on creating a better future for Aotearoa New Zealand through remarkable technology solutions that simplify lives and businesses and operate New Zealand's largest 5G network. We maintain almost three million connections with consumer, business, public sector and wholesale customers via Vodafone and Farmside, New Zealand's rural broadband specialist. We're proud to help other Kiwi businesses to thrive by partnering with world-leading brands to offer best-in-class ICT services. Vodafone New Zealand is owned by Infratil and Brookfield Asset Management and we are a partner market in the Vodafone Group, one of the world's largest telecommunications companies. For more information, please visit www.vodafone.co.nz.
- 3.21 Because our customers are at the heart of what we do, we have invested over \$1 billion in building and upgrading this mobile network. As the first telecommunications company to introduce 2G, 3G and then 4G, we have a proud history of investing in innovative technology to deliver faster data speeds. Since 2012, we have partnered with the Government in helping ensure rural New Zealanders can access better mobile coverage and data speeds through the Rural Broadband Initiative. As telecommunications continue to evolve, we have rolled and are expanding our 5G network technology, and developed platforms to support the nascent IOT (or Machine to Machine) applications that will create massive change to our economy.
- 3.22 Our commitment to providing telecommunication services across New Zealand, is matched by our commitment to supporting communities across New Zealand. In 2002 we established the Vodafone NZ Foundation and have subsequently donated \$25

million to communities in need. The Foundation is also home to our Instant Network, a suite of mobile devices that allows specially trained staff to establish local communications networks in disaster situations. Recent examples include the Christchurch, Kaikoura earthquakes, and the tropical cyclones that have wreaked havoc in Vanuatu and Fiji.

4. TELECOMMUNICATIONS ENGAGEMENT

4.1 Our experience across New Zealand is that engagement, especially with the mobile network operators such as Spark and Vodafone is usually only at the request of companies, but should be led by local authorities, the purpose of for example:

- Development of plans including regional, district or spatial
- Consideration of the telecommunication needs of customers in new developments or development areas
- Resource consents for example a building height infringement

Our submission requested strengthening of the obligation to recognise telecommunication networks and require engagement as an opportunity to achieve development that is integrated with infrastructure planning and funding decisions and secondly a requirement to assessment impact on adjacent infrastructure such as cell sites when considering a building height infringement. We note that this is a more recent change in our submission strategy and is not specifically aimed at Dunedin City.

4.2 We involve ourselves, often as a shared grouping of Spark, Chorus and Vodafone, in all the Plan reviews relevant to telecommunication industry interests. It is uncommon for councils to proactively seek to engage and involve us in the development of Plans or significant developments or spatial plans for growth. It is rare for a S32 report to address the needs of private infrastructure such as telecommunications. The most common ways we become involved in the process is when draft or proposed Plans are notified. Our general approach is to provide feedback and request a workshop with council and other network utility providers plus key stakeholders. The purpose of the workshop is primarily about education, 2 ways, utilities to learn about the community's infrastructure needs and secondly for education about the needs of network utilities and our operational requirements.

4.3 Spark and Vodafone along with Chorus have developed a relationship with Dunedin City during the long 2GP process. Consequently Council, Jane MacLeod approached Graeme McCarrison in October 2019 with an initial request for feedback on the

potential variation proposal to ensure that Dunedin had enough land zoned to meet growth needs over the next 10 years. In July 2020 Council reached out with a formal request for feedback on any potential concerns or issues to increase the capacity of telecommunication infrastructure in any areas within the city in response to the shortage of housing within the city following a period of increased growth. The request was focused on engagement with Chorus. Consequently, Graeme McCarrison distributed the request to Chorus, Vodafone and 2 Degrees. Graeme McCarrison provided general feedback on 7 August 2020 regarding wireless coverage to the existing Dunedin communities. Regarding new areas we indicated that to serve these we would need to develop additional infrastructure. It was too early in the development process to be able to undertake network planning to establish where additional sites would be required. We requested that for the provision of future telecommunications infrastructure and its funding will need to be planned and discussed with the industry during the development of new areas. We recognise that it can be confusing and complex for local authorities to know how to communicate with our industry, given the multiple network providers and means of providing telecommunications. This is reflective of an open and competitive telecommunications market, that the government has established and regulates via the Commerce Commission to ensure the competition is strong. In Dunedin the majority of telecommunication networks are Spark, Vodafone, Chorus and 2degrees. Our opinion is that when telecommunications matters are being considered that Council and major developers should approach at least these operators to provide the opportunity to comment.

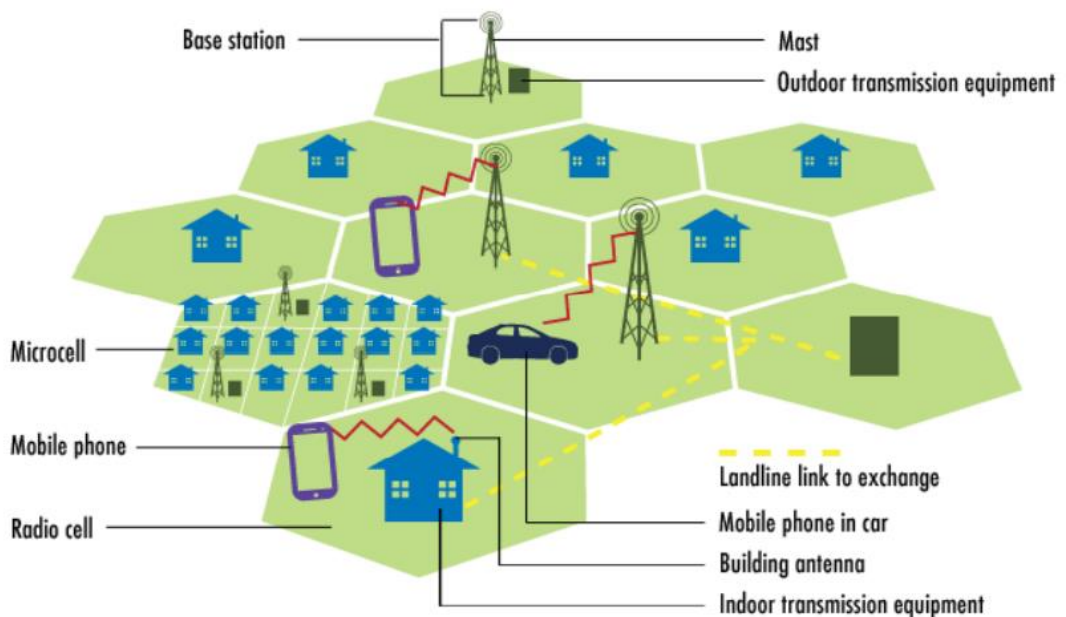
- 4.4 It has been our experience that the wireless network providers such as Spark and Vodafone are not consulted with by developers including Kainga Ora when planning new developments. Consequently, it can be difficult to provide wireless services to new large developments. Customers i.e. residents and business expect to have telecommunication connectivity anywhere they are and with a choice of service providers. Commonly connectivity choices for customers are via the following type of networks in urban areas:

- Fixed line i.e. fibre to a building or premises delivering internal services
- Wireless provides service inside and outside a building or premises
- Combination of wireless and fibre

Ultra-Fast Broadband (UFB) programme to replace the old copper network in urban area is a public-private partnership between Crown Infrastructure Partners on behalf of the Crown and four partners awarded contracts for different parts of the Country.

Ultra-fast Broadband (UFB) programme is the broadband scheme deploying fibre-to-premises to 87 per cent of the population in 405 cities and towns by 2022. The wireless networks of operators such as Spark and Vodafone are funded privately. Consequently, new network is generally only funded when it is commercially viable and there is demand. This generally means when construction is underway and there is some certainty on a commercial return on investment. It can be hard to retrofit this infrastructure into developments underway or completed.

4.5 The following shows the basics of a mobile network.



4.6 Engagement with telecommunication operators at the early planning stages of development is essential to ensure future generations of property owners can obtain the telecommunication services they reasonably expect. It is also critical for the deployment of affordable infrastructure solutions that take into account the telecommunications market, technological developments, or the ongoing requirements for managing telecommunications infrastructure. Key consideration for developments include:

- Recognising where existing infrastructure is in situ, as moving it is often extremely expensive and if there is no alternative this needs to be factored into the developer's cost.
- The location of telecommunications infrastructure does not necessarily influence development, but it is important for future communities to understand what telecommunications has been planned.

- Planning and funding for the construction telecommunications infrastructure to support the new growth areas with both coverage and sufficient capacity will support growth.
- 4.7 The location of development relative to other supporting and enabling telecommunications infrastructure can significantly influence the cost of providing telecommunications services. It is important that these costs are considered at the early stages of development and not left to be borne by individual property owners
- 4.8 Variation 2 provisions have a strong focus on public infrastructure (three waters and roading), and less of a focus on additional infrastructure such as telecommunications and electricity distribution which are also critical components for functioning urban environments. We note that the NPS-UD requires that local authorities:
- Clause 3.5, *must be satisfied that the additional infrastructure (includes telecommunication and electricity) to service the development capacity is likely to be available.*,
 - Clause 3.13 - Future Development Strategy (FDS) assist the integration of planning decisions under the Act with infrastructure planning and funding decisions. This includes a requirement to engage with providers of additional infrastructure; a FDS must spatially identify the development infrastructure and additional infrastructure required to support or service that development capacity, along with the general location of the corridors and other sites required to provide it; and
 - Objective 6: *Local authority decisions on urban development that affect urban environments are:*
 - a) *integrated with infrastructure planning and funding decisions; and*
 - Objective 8: *New Zealand's urban environments:*
 - a) *support reductions in greenhouse gas emissions; and*
 - b) *are resilient to the current and future effects of climate change.*
 - Policy 10 requires
 - b) *engage with providers of development infrastructure and additional infrastructure to achieve integrated land use and infrastructure planning; and*

- Housing and Business Development Capacity Assessment (HBA)
preparation process requires that tier 1 & 2 (Dunedin) local authorities must seek information and comment from the providers of development infrastructure and additional infrastructure.

- 4.9 While the NPS-UD and the 2GP including Variation 2 provide for engagement. seeking input and information regarding telecommunications we are not aware of the communication processes that will ensure that Council and developers will engage and plan including funding as appropriate for “other infrastructure” to have capacity to enable the new growth areas to function and have services that residents and businesses depend. What is also unclear is if all the telecommunication network operators would be engaged with Dunedin City Council or just a single operator. It is our opinion and request that wireless and fixed line operators be part of the conversation when planning for development including specific developments occurs. We appreciate that Council reached out in the early stage of the Variation it our opinion that focus is supporting the planning and funding of public infrastructure rather than other infrastructure such as telecommunications. We need to be involved at every stage of the planning to implementation/construction of development areas.
- 4.10 The use of the Transition Overlay Zone process that enables future land for residential, industrial land to be identified as appropriate for growth and where infrastructure servicing has not been planned and then transitioned when infrastructure is available is supported.
- 4.11 What Spark and Vodafone are seeking is an operational procedure to ensure telecommunications networks are engaged with in regard to the release of further urban land so they can identify any constraints and plan for what is required. There would be no particular performance criteria to meet other than to certify that the telecommunications network operators and other non-public infrastructure operators such as electricity and gas distribution have been advised. We consider it critical that before land goes from transition status to being considered ‘infrastructure ready’ for development that the telecommunication network operators and other network utilities have the opportunity to be informed and ideally work collaboratively to enable that the new land is fully serviced all with critical infrastructure.

5. IMPACT OF INTENSIFICATION AND BUILDING EXCEEDING THE HEIGHT STANDARDS

5.1 We rely on regulatory frameworks both nationally, via the National Environmental Standards for Telecommunications Facilities 2016 (NESTF), and locally, via the 2GP, to protect the existing network and appropriately enable the upgrading of existing networks and construction of new networks. The permitted rules for height of new or upgraded telecommunication facilities are where possible to ensure that the antennas are of a height above the permitted building height to ensure:

- Radiofrequency emission compliance with the NESTF regulation 55
- Certainty of network coverage and capacity to service customer needs



5.2 While telecommunication network technology requirements are constantly changing and evolving unlike any other infrastructure sector it expensive to have to relocate a site because of unanticipated changes in buildings due to permitted height infringements. The impact of radio signal path loss is shown in the above figure and in Appendix 1. Over height new or existing buildings can lead to the need to relocate an existing site. For Spark nationally this occurs approximately 4 times a year costings on average \$350,000 per site and between \$1.2 to \$1.5 million. Occasionally the loss of a site leads to replacement with 2 or more sites to achieve the same coverage footprint as it is increasingly difficult to acquire new locations especially in residential areas for a range of reasons:

- a. Physical environment e.g. contours of the locality, height of existing buildings or shelter belts/vegetation that interfere with coverage
- b. Site characteristics e.g. wind, soil conditions, access to the site and power, slope of the property

- c. Converting a streetlight pole under the NESTF to combined telecommunication facility may not be possible as the streetlights in new residential development as to low and narrow in width to achieve a permitted outcome.
- d. Opposition to telecommunication facility, even if permitted under the NESTF or the 2GP by residents. Spark and Vodafone follow the TCF engagement guidelines when establishing new sites or undertaking significant upgrades in residential areas or near public facilities such as school or a childcare.
- e. Regulatory requirements i.e. development controls such as height and consideration of significant cultural sites or outstanding natural landscapes,
- f. Compliance with radiofrequency emission standards (NESTF)
- g. Build costs
- h. Proximity to potential customers – generally the aim is to have within proximity to the customers
- i. Access to appropriate property/s i.e. reasonable lease agreement with the owner/s

5.3 The process to find new sites can be anywhere from 3 to 18months. Complexity of this is partly given the wide range of disciplines involved in:

- Radio Frequency (RF) Engineers who predict expected coverage areas
- Deployment Engineers
- Civil Engineers
- Acquisition Project Managers
- Resource Management experts and
- Property Consultant experts

5.4 It is our experience that telecommunication infrastructure is not assessed as being an affected party nor are the impacts of the height infringement on our infrastructure reported on or taken into account. We do not understand why the impact on existing infrastructure of development is undertaken into account. It is acknowledged that we do not have any Dunedin examples of having to relocate due to height infringements.

5.5 Typically, telecommunication facility (cell site) should be at least 3m to 5m above adjacent buildings – sometimes the telecommunications take the risk they don't think they will be built out due to existing site configuration e.g.. large car park in front of commercial building. Permitted zone height is a factor considered when establishing a facility. A small height infringement can impact on the site's performance. Being higher than buildings that are permitted is critical for reasons including:

- a. The site antennas must be high enough to enable a device to have reasonable of sight.
 - b. Compliance with radiofrequency emission standards (NESTF).
 - c. Flexibility to design the facility to the coverage and capacity needs of a locality and the wider network.
 - d. Additional height enables the opportunity for co-location of providers on a single mast.
- 5.6 We do not have examples of conditions that may be imposed on consents granted for a building height infringement that impacted a telecommunication facility. Depending on the scale of height infringement we would be seeking potentially:
 - Potentially a decline
 - Explore options for the re-design of the building
 - Explore opportunities for the relocation of the telecommunication site
 - Compensation for the cost of relocation
 - Opportunity to communicate and work with Council and applicant
- 5.7 Generally, we only get to find out about new buildings that impact on our sites once construction starts, often via the real estate agent or construction workers raising concerns about being near a telecommunication facility or focus is ensuring health and safety and on-going customer connectivity.
- 5.8 Regarding any examples of other district plans in New Zealand or elsewhere that manage this type of effect when height limits are contravened. The Auckland Unitary plan for height infringements for example under H4 Residential – Mixed Housing Suburban Zone the matters of discretion under H4.8.1(4) include “(c) the effects of the infringement of the standard”. This would provide scope to consider infrastructure effects due to its broad nature. However, in our view something more specific would make it clearer for plan users and the Council what needs to be considered.

6. TELECOMMUNICATION CONNECTIONS

- 6.1 The Telecommunications Carriers’ Forum (**TCF**) in 2010 published non-statutory guidelines for Territorial Authorities on minimum standards for telecommunications infrastructure for new subdivisions. TCF is the telecommunications industry organisation that works within the industry to resolve regulatory, technical and policy issues and provides a bridge to government. The objective of the TCF is

Our objective is to actively foster cooperation among the telecommunications industry to enable the efficient provision of regulated and non-regulated telecommunications services. Our goal is to promote competition for the long-term benefit of consumers.

6.2 The guideline document was developed in response to enquiries from Local Government were received by the TCF regarding standards for telecommunications infrastructure for new subdivisions. The TCF via the Local Government Working Party agreed established principles for new subdivision infrastructure. The document recognised

- That the inclusion of telecommunications infrastructure by property developers at an early stage of subdivision development is essential to ensure future generations of property owners can obtain the telecommunications services they reasonably expect and avoid future disruption to the community and degradation of pavement surfaces.
- Telecommunications infrastructure and services are deployed on a commercial basis only. No telecommunications operator has an obligation to provide services.
- That the challenge for developers is to find a cost-effective infrastructure solution that will endure for many years beyond the developer's direct interest in a subdivision, provide for all future technology and service enhancements, and provide for the services from service providers that property purchasers will find attractive.
- Councils have the opportunity to ensure future proof, yet affordable infrastructure solutions are deployed via subdivisions or other resource consents.

6.3 The guideline document recommendations that:

- a. All district plans should have a minimum requirement for developers to provide telecommunications infrastructure and the ability to supply telecommunications services to each subdivided lot.
- b. That prior to the release of final local authority clearance for a subdivision developers should be required to provide written confirmation that the telecommunications infrastructure owner's installation requirements have been met along with written evidence from a telecommunications provider that the appropriate network capacity is available or planned to be available to service the subdivision.

- c. Costs to install telecommunications infrastructure is a commercial arrangement between the developer and their selected telecommunications infrastructure provider.
- d. That all district plans or related codes of practice should consider zoning and suitable locations for wireless telecommunications infrastructure to support increasing demand for high speed internet access and mobility. The location of these sites should afford good line of sight coverage of the subdivision.

6.4 Ten years on the TCF has commenced a review of the effectiveness of the guidelines for a number of reasons including:

- Changing technology.
- Expectations of customer demands to have connectivity everywhere.
- Wireless broadband.
- Impact and change in expectations due to the government's ultrafast broadband (UFB1 & 2) and Rural Broadband Infrastructure (RBI 1 & 2) programmes of work.
- Requests from a number of Councils for improved guidelines or best practice provisions to determine that telecommunications services are available or not for a proposed subdivision or development.

6.5 Auckland Unitary Plan requires that a subdivision must comply with the relevant standards including E39.6.1.3 below. This places the onus on developers of providing or proving that the services such as telecommunications are available.

E39.6.1.3. Services

(1) For all proposed sites capable of containing a building, or for cross-lease, unit title, strata title or company lease, each building must be designed and located so that provision is made for all of the following services:

- (a) collection, treatment and disposal of stormwater;
- (b) collection, treatment and disposal of wastewater;
- (c) water supply;
- (d) electricity supply; and
- (e) telecommunications.

6.6 In the Waikato District Proposed Plan under 14.3.1.P12 as set out below requires all new lots to have access to telecommunications that is either hard wired (fixed line) or wireless.

P12	Service connections for subdivision	14.3.1.8 (1) All new lots created as part of a subdivision other than a utility allotment, access allotment or reserve allotment, must be designed and located so that provision is made for access and service connections up to the boundary of the lot for: (a) Wastewater; (b) Water supply;
		(c) Stormwater (a management system that complies with Rule 14.11.1.1); (d) Electricity supply; (e) Telecommunications that is hard-wired or wireless; and (f) Vehicle access that complies with Rule 14.12.1.1.

- 6.7 The Spark, Chorus and Vodafone requested via submission and evidence that the rule did not specify the type of telecommunications e.g. fixed line or wireless services.
- 6.8 In Dunedin we request that the reference in rule 9.3.7.X to '*ultra-fast fibre*' be replaced with '*telecommunications*'. Compliance with rule 9.3.7.X should be via formal confirmation from the relevant telecommunication network operators such as Chorus, Spark, Vodafone, and 2degrees but not retail telecommunication service providers. Telecommunication network operators are the only companies that assess that there are telecommunication services available and what these are at the site of the proposed subdivision. These companies can work with Council and developers of subdivisions to upgrade existing or construct new network to meet the potential demand services created by the new lots. Councils should not be relying on indicative service provisions websites as provided by Internet NZ <https://broadbandmap.nz/home> are designed to assist potential consumers of the likely providers options to determine if a new subdivision or development has telecommunication connection. As with the network operators own coverage maps the sites make it clear that there is no guarantee availability of service and potential customers need to contact the network operator.
- 6.9 A risk of the district plan limiting that the opportunity to ultra-fast fibre means that future wireless technologies, evolving now, such as 6G and satellites Starlink (SpaceX) and Amazon plus others Low Earth Orbit (LEO) satellite constellations will supplement ground based mobile network infrastructure to increase network coverage extending cellular including 4G/5G networks to air, sea and other remote areas not covered by small cell networks and provide a backup in the event of natural disasters like earthquakes, floods, fires, and storm events. Potential to offer integration with networks to manage connectivity to cars, vessels, airplanes and other IoT devices and Machine to Machine (M2M) connections on farms and remote

worksites in remote and rural areas, assist with the delivery of enhanced mobile broadband and next-generation IoT devices by providing higher data rates and low latency across a constellation of satellites.

- 6.10 Further discussion and information will be presented at the 3 Waters connections stage of hearings for Variation 2.

7. CONCLUSIONS

- 7.1 Telecommunications infrastructure is essential for shaping and enabling the future of Waikato by ensuring that residents and businesses have the opportunity to be connected internationally and across New Zealand. Changes in the way people access and use telecommunications and data networks is rapidly evolving. It is critical that the regulatory framework provides certainty and enables efficient roll out of current and future technology.
- 7.2 While it is recognised that the telecommunication industry is complex and requires involvement of multiple company's local authorities should be proactively working with the industry specially to support all customers to get access to the digital services they demand. The NPS-UD recognises additional infrastructure i.e. telecommunications and electricity to ensure to achieve integrated land use and infrastructure planning for the growth areas. It is important that the policies and provisions of Variation 2 and councils processes around new development support telecommunications to be integrated into the Dunedin growth areas. We are looking to forward to continuing to work with Dunedin City.

Graeme McCarrison, and Colin Clune

3 September 2021

Appendix 1

Radio signal path loss

Path Loss

Path Loss, as a radio propagation concept, refers to the phenomenon of the power density decrease (attenuation) of an electromagnetic wave as it propagates through space i.e. from mobile base station to mobile phone (downlink), and vice versa (uplink). Path Loss is a key factor in the design of any wireless communications system.

Path loss can be caused by various factors:

- Free-space loss (distance)
- Fading (frequency dependent)
- Shadowing
- Reflections at large obstacles
- Refraction depending on the density of the medium
- Scattering at small obstacles
- Diffraction at edges

Other important variables in determining the path loss are the environment (urban, suburban or rural), terrain contours, absorption (buildings, walls, vegetation), the distance between transmitter and receiver, and the type and height of antennas.

The formulas for calculating path loss are outside the scope of this document.

Path loss

