

Mobile Market Study – Findings

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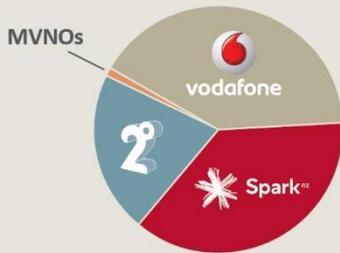
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Commerce Commission

Wellington, New Zealand

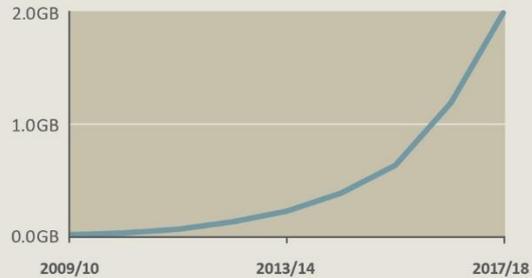
Mobile market overview

Market share*

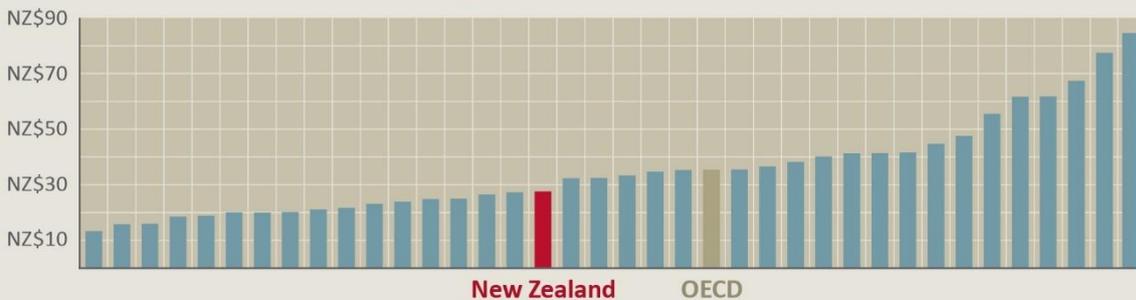


2 parties have recently announced MVNO deals

Average data usage per month*



Affordability** (100 calls and 2GB monthly)



New Zealand's 4G performance[†]

NZ speeds



8th of 88 countries

NZ availability



57th of 87 countries

Consumers[^]

Roughly **60%** of consumers say it's easy to find out their usage and compare plans, but **68%** rarely or never do.

Only **19%** of consumers say switching is difficult but **54%** have not switched in the last five years.



Emerging trends

eSIMs

We expect eSIM capable devices to become more prevalent and reduce switching costs for businesses, consumers, MVNOs and MNOs.

Internet of Things

Mobile traffic will grow significantly in the future with the continued growth of machine-to-machine communications and the Internet of Things.



Radio spectrum

5G Spectrum allocations are critical for competition and MVNO entry.



* Source: Commerce Commission 2018 Annual Monitoring Questionnaire responses ** Teligen (May 2019)
[†] OpenSignal. Speeds (February 2018) availability (May 2019) [^] Consumer NZ's survey of mobile consumers 2018

Glossary

Acronym	Title
2G	2nd Generation mobile communications technology
3G	3rd Generation mobile communications technology
4G	4th Generation mobile communications technology
5G	5th Generation mobile communications technology
ACCC	Australian Competition and Consumer Commission
ARPU	Average Revenue per month per User/subscriber
Backhaul	In a telecommunications network, backhaul is the capacity between the core backbone network and the local edge networks
BEREC	Body of European Regulators for Electronic Communications
CDMA	Code-Division Multiple Access – a 2G mobile phone standard developed in the United States
CDR	Consumer Data Right – typically a data portability right, whereby a consumer can easily provide a standardised set of their usage information to a potential provider
Commerce Act	The Commerce Act 1986
DFAS	Direct Fibre Access Service defined in section 164 of the Telecommunications Act. Typically used in mobile networks for dedicated backhaul services
EBITDA	An accounting term – Earnings Before Interest, Tax, Depreciation and Amortisation
eSIMs	Embedded SIM – a non-removable version of a SIM card
Ethernet	A family of computer networking technologies most commonly used in wired Local Area Networks and Wide Area Networks
GB	Gigabyte. 1 gigabyte = 1024 megabytes
GCSB	(NZ) Government Communications Security Bureau
GHz	Gigahertz. 1 gigahertz = 1000 megahertz
GSM	Global System for Mobile communications – a standard developed to describe the protocols for 2G digital cellular networks
GSMA	Global System for Mobile Communication Association – trade body that represents the interests of mobile network operators worldwide
IoT	Internet of Things – the network of physical and virtual objects accessed through the internet (such as smart sensors and smart meters)

IP	Internet Protocol – the method or protocol by which data is sent from one computer to another on the internet. Each computer (host) on the internet has at least one IP address that uniquely identifies it from all other computers on the internet
LFC	Local Fibre Company – provider of fibre access services under the NZ Government’s UFB initiative (see section 156AB of the Telecommunications Act)
LTE	Long Term Evolution – a name given to the fourth generation of mobile technology that can provide high speed mobile broadband
MBIE	Ministry of Business Innovation and Employment
MBSF	Mobile Black Spot Fund – Government fund to provide greater mobile coverage on state highways and in tourism locations where no coverage currently exists
MHz	Megahertz – one million oscillations per second
MNO	Mobile Network Operator – an operator that owns or controls all the elements necessary to deliver mobile services to consumers, including radio spectrum and the wireless network infrastructure
MTAS	Mobile Termination Access Service – a regulated service that provides for the termination on a cellular mobile telephone network of voice calls and SMS messages
MTR	Mobile Termination Rates – the wholesale prices for the MTAS
MVNE	Mobile Virtual Network Enabler – a company that provides the platforms to keep pace with rapidly evolving consumer demand for services. They also allow rapid on-boarding and integration of an MVNO with an MNO and provide the ability to connect with third parties via defined IT systems
MVNO	Mobile Virtual Network Operator – an operator that provides mobile services but does not generally have its own radio spectrum or much of the infrastructure required to provide mobile services. It therefore relies on buying services from an MNO. The amount of control it has over the services it offers will vary according to the nature of its agreement
NERA	NERA Economic Consulting
OECD	Organisation for Economic Cooperation and Development
Ofcom	Office of Communications – the regulatory and competition authority for broadcasting, telecommunications and postal industries in the United Kingdom
OTT	Over the top – refers to content and applications provided from a third party and delivered to an end user device, leaving the retailer responsible only for transporting IP packets

RBI (and RBI2)	Rural Broadband Initiative – an initiative where the Government partners with private sector telecommunications operators to upgrade or extend telecommunications networks outside UFB areas
RCG	Rural Connectivity Group – a joint venture between 2degrees, Spark and Vodafone who have a contract with the Government under RBI2 and the MBSF
RSP	Retail Service Provider – RSPs provide telecommunications services to consumers
RSM	Radio Spectrum Management – business unit of MBIE responsible for managing radio spectrum
RTP	Restrictive Trade Practices
SIM	Subscriber Identity Module card – commonly known as a SIM card that contains a microchip that stores data that identifies the user, for use in GSM and compatible 3G and 4G mobile phones
SMS	Short Message Service – commonly known as a text messaging, this is a service for sending and receiving short messages between mobile devices
STD	Standard Terms Determination – the Commerce Commission’s primary mechanism for regulating non-fibre telecommunications services under the Telecommunications Act by determining the terms on which a designated access service or specified service must be supplied
Telecommunications Act	The Telecommunications Act 2001
UFB	The New Zealand Government's Ultra-Fast Broadband initiative
UMTS	Universal Mobile Telecommunications System – the 3G successor to the 2G GSM standard, which allows voice telephony, mobile internet access, fixed wireless internet access, video calls and mobile TV
WiFi	Wireless Fidelity Standard – a series of standards for a popular technology that allows electronic devices to exchange data wirelessly (using radio waves), including allowing mobile devices to connect to high speed internet connections
WISPA NZ	Wireless Internet Service Providers Association of New Zealand Inc – an association of Wireless Internet Services Providers (WISPs) that typically service rural locations in New Zealand where mobile networks currently do not operate, or have limited coverage

TABLE OF CONTENTS

Glossary	4
Executive summary and findings	9
<i>Mobile services market study</i>	9
<i>Competition in the mobile market</i>	9
<i>Findings from our study of the mobile services market</i>	10
Chapter 1 Introduction	16
Purpose of the study and legal framework	16
<i>Purpose of the study</i>	16
<i>Legal framework for the study</i>	17
<i>Timeline of the study</i>	17
<i>Purpose and structure of the Findings report</i>	18
Chapter 2 Mobile networks and services	20
<i>Purpose of this chapter</i>	20
<i>Mobile networks</i>	20
<i>Mobile services</i>	22
<i>Mobile service providers</i>	25
<i>Mobile regulatory settings in New Zealand</i>	26
<i>Changes to regulation</i>	27
Chapter 3 Development of mobile services and competition	28
Purpose and structure of this chapter	28
<i>Purpose</i>	28
<i>Structure</i>	28
Analysis of the mobile market	28
<i>Market structure and market shares</i>	29
<i>Bundling</i>	34
<i>Pricing</i>	36
<i>Usage trends</i>	46
<i>Investment</i>	48
<i>Profitability</i>	50
<i>Quality of mobile services</i>	52
<i>Consumer satisfaction</i>	54
Our views on the key issues in the mobile market	57
<i>Spectrum</i>	57
<i>MVNOs</i>	58
<i>Consumer engagement</i>	59
Chapter 4 Key issues we identified	60
Purpose and structure of this chapter	60
Spectrum	60
<i>Introduction</i>	60
<i>Spectrum and competition between existing MNOs</i>	60
<i>Spectrum and new entry</i>	66
<i>Other obligations and payment terms for spectrum allocation</i>	69

MVNOs	72
<i>Introduction</i>	72
<i>Potential benefits to consumers from MVNOs</i>	72
<i>MVNO operating models and margins</i>	75
<i>Emerging competition at the wholesale level</i>	77
Consumer engagement and experience with mobile services	85
<i>Introduction</i>	85
<i>How easily can consumers access the information they need?</i>	85
<i>How easily can consumers assess the information they have?</i>	86
<i>How easy is it for consumers to act?</i>	90
<i>Behavioural biases</i>	94
<i>Potential remedies/actions</i>	96
Chapter 5 State of competition in the mobile market	100
Purpose and structure of this chapter	100
<i>Purpose</i>	100
<i>Structure</i>	100
Our view on the state of competition in the mobile market	100
<i>Existing competition</i>	100
<i>Conditions for further expansion and entry</i>	104
<i>Consumer engagement</i>	106
Chapter 6 Future developments in mobile services	109
Purpose of this chapter	109
5G mobile networks	109
eSIMs	112
Network slicing	114
Infrastructure sharing	115
Chapter 7 Regulated services	119
Purpose of this chapter	119
Mobile termination access services	119
National roaming	122
Mobile co-location	123
Number portability	125
Backhaul	125

Executive summary and findings

Mobile services market study

- X1 Mobile communications have developed into an essential function, supporting New Zealanders in all aspects of their lives. Mobile services allow consumers to contact friends and family, conduct business, be entertained, and engage with Government, medical, educational and emergency services when not connected to a fixed network. The importance of mobile communications is expected to increase even further in the future with the continued growth of machine-to-machine communications and the internet of things (IoT).
- X2 Rapid technological change is a hallmark of the telecommunications sector, particularly in markets in which mobile services are supplied. Non-traditional network providers and over the top (OTT) suppliers such as Google and Apple add to the challenges for regulatory authorities and policy makers seeking to ensure that the competition and regulatory policy settings are appropriate.
- X3 One of our mandates under the Telecommunications Act 2001 (Telecommunications Act) is to monitor competition, and the performance and development of, telecommunication markets. In this study we have analysed the current state of competition for mobile services, likely future developments, and the potential impacts on competition and consumers. This analysis included examining issues of how the supply of mobile services has performed, barriers to entry and expansion, and the extent to which consumers of mobile services are engaged and can take advantage of competing retail offers.

Competition in the mobile market

- X4 Three vertically integrated national mobile network operators (MNOs) - 2degrees, Vodafone and Spark - provide retail mobile services to New Zealand consumers. Alongside these MNOs are a small number of mobile service providers that operate solely at the retail level as mobile virtual network operators (MVNOs). These retail-only mobile operators include the Vocus brands and the Warehouse, as well as sub-brands like Spark's Skinny mobile. Kogan Mobile has also recently launched mobile services in New Zealand. This compares with ten years ago when there were only two vertically integrated national MNOs and a small number of MVNOs and no MNO sub-brands.
- X5 Increased competition has contributed to improved outcomes for consumers through lower prices, increasing quality, and greater choice of services. Most key indicators like pricing, quality of service, coverage, and choice are trending in a positive direction.

X6 During our study, we identified spectrum, MVNOs and consumer engagement as important factors likely to influence the further development of competition in the mobile market going forward.

Findings from our study of the mobile services market

X7 In this section we set out our consolidated findings and our actions arising from our study into the mobile market.

X8 Table X1 sets out our general findings on the current state of the mobile market.

Table X1 Findings on the development of the mobile market

Finding number	Finding
F1	Market shares among the three national MNOs have become more evenly balanced over time, particularly in the prepaid and residential on-account segments.
F2	Ongoing investment in the mobile networks has seen all three MNOs investing in new generations of mobile technology and 2degrees completing the roll-out of its national network.
F3	All three national MNOs are reporting profits, although profit margins vary, reflecting differences in market share and mix of customers.
F4	The three national MNOs appear to perform well on most technical measures of quality, although there is some evidence that the quality of coverage for 4G services (as measured by availability) may be relatively low compared to other countries.
F5	Prices of mobile services have been falling. Prices for low and medium usage bundles compare well with other OECD countries. Prices for higher usage bundles remain relatively expensive, especially when compared with Australia, although recent market developments have resulted in ongoing innovation and improved value for consumers in relation to higher usage bundles.
F6	Usage of mobile calls and in particular mobile data has continued to increase in recent years, with the amount of mobile data used per subscriber more than doubling over the last two years. Although average usage of mobile data appears to be relatively low compared to other countries, this may be due to a number of factors, including pricing of higher usage bundles and the availability and quality of fixed networks (including WiFi hotspots) in New Zealand.

X9 Tables X2, X3 and X4 set out our findings on the key issues of spectrum allocation, MVNOs, and consumer engagement.

Table X2 Findings on spectrum

Finding number	Finding
F7	Spectrum is a scarce and critical input into the supply of mobile services. Significant asymmetries in spectrum holdings (including in terms of the amount and type of spectrum held) can affect competition in the mobile market. The design of future allocation processes for spectrum should have regard to such asymmetries. In setting limits on the amount of spectrum that may be acquired, it may also be appropriate to have regard to existing holdings in other bands which represent a substitute for the spectrum being auctioned or allocated.
F8	We do not believe there is a case for regulatory intervention to promote a fourth national MNO to enter the market. However, the design of the upcoming 3.5 GHz spectrum allocation process should not preclude new parties (including parties who may complement or compete with the existing MNOs) from obtaining spectrum.
F9	We do not believe that there is a strong case for including a condition on spectrum rights that requires wholesale access to be offered to third parties.

Table X3 Findings on MVNOs

Finding number	Finding
F10	Until recently, wholesale competition between MNOs to host MVNOs has been limited. MVNOs currently serve just over 1% of the retail mobile market, although there is some evidence that increased wholesale activity by 2degrees has prompted a response from Spark and Vodafone in offering MVNO access. New commercial MVNO agreements have been signed during the past 18 months, such as those between Trustpower and Spark, and Kogan Mobile and Vodafone.

F11	With three national mobile networks, sufficient competitive conditions at the wholesale level exist and we expect MVNOs should emerge if they are commercially viable. The commercial viability of an MVNO will in part depend on the terms agreed with the host MNO. Based on the evidence that we have seen and the entry expected (as noted in F10), competition at the wholesale level has improved. However, spectrum allocation decisions will be critical to support this competition.
F12	In light of this, we do not consider MVNO access regulation to be appropriate at this time. There would need to be greater evidence of market failure in respect of outcomes delivered to mobile consumers to justify wholesale access regulation. We intend to monitor the development of MVNOs, including the commercial terms being offered by the MNOs.

Table X4 Findings on consumer engagement

Finding number	Finding
F13	Most consumers can easily access their mobile usage information, but information on mobile performance (speeds, actual quality of coverage etc) is harder to access.
F14	Most consumers find it easy to compare available plans, but report that they only do so infrequently.
F15	<p>Our evidence shows that the process for residential consumers to switch between mobile suppliers is relatively easy, given that:</p> <ul style="list-style-type: none"> a) mobile number portability is available; b) there are low numbers of locked handsets; and c) long-term contracts for residential consumers are not prominent. <p>Bundling of mobile and fixed-line services, which can increase customer stickiness, does not appear to be widespread in the residential market.</p>
F16	While residential consumers report being able to easily access usage information and compare plans, and that the process of switching appears to be relatively easy, a significant proportion of consumers have not compared plans in the last 12 months and have remained with their current supplier for more than five years. This suggests that there is a degree of consumer inertia, and we have commenced an analysis of mobile bills to shed light on whether this is cause for concern.

F17

Switching in the business market appears to be more complex and more infrequent than residential mobile services. Businesses typically purchase mobile and fixed services as a package, often through fixed-term contracts, with brand reputation being an important driver. Larger business customers are more sophisticated buyers, generally have more access to specialist advice and support, and are more likely to have dedicated procurement resources.

X10 A summary of our findings on the state of competition and our actions is set out in table X5 and table X6 below.

Table X5 Findings on the state of competition

Finding number	Finding
F18	Our view is that competition in the retail mobile market has become more established with three independent, national network-based competitors. This has resulted in mobile consumers benefitting from an increasingly competitive market environment.
F19	There remain some areas where we anticipate competitive outcomes for consumers could improve further, such as pricing for higher usage bundles of mobile services (although recent market developments have improved consumer outcomes for higher usage bundles). Average mobile data usage in New Zealand remains low by international standards, which may be due to a number of factors, including pricing of higher usage bundles and the availability and quality of fixed networks (including WiFi hotspots) in New Zealand.
F20	We believe that the conditions for effective competition exist, with the three MNOs each having a network of similar technology with similar geographic and population coverage metrics. We consider that: a) spectrum must be allocated with wholesale and retail competition matters at the forefront of decisions; b) with the pre-conditions for competition in place and the adequate allocation of spectrum, we would expect MVNO services to continue to develop where market opportunities exist; and c) there may be room for improved consumer engagement, to ensure that consumers are aware of and able to easily take advantage of competing offers to drive competition.

Table X6 Actions on the state of competition

Action number	Action
A1	We will continue to engage with MBIE on the importance of the upcoming spectrum allocation/auctions for delivering competitive outcomes in the mobile market.
A2	We have amended the annual monitoring questionnaire to capture information on the development of MVNO market share and business sustainability. We also intend to periodically review commercial MVNO arrangements. This will provide us with greater ongoing visibility of the terms being offered to MVNOs, and how the commercial terms compare to key price and non-price dimensions of MVNO access.
A3	<p>We will undertake further work as part of our wider responsibilities under section 9A and Part 7 of the Telecommunications Act (outside of this study) to:</p> <ul style="list-style-type: none"> a) improve our understanding of the extent to which consumers can and do access, assess and act on relevant information in the mobile and wider telecommunications markets; b) assess consumers’ choices of mobile plans against their usage, including quantification of the potential savings mobile consumers could make if they were on plans that better match their usage; and c) assess the quality of services provided by mobile suppliers and the extent to which consumers are actively engaged in the mobile market, as part of our wider retail service quality programme, including our ability to review or create retail service quality codes if appropriate.

X11 In table X7 we summarise our findings on some of the potential future developments that may affect competition.

Table X7 Findings on future developments in the mobile market

Finding number	Finding
F21	5G will initially be an evolution over existing networks, and over time network densification will occur. Investment in 5G may alter the economics of mobile provision and raises the prospect of greater infrastructure sharing, and larger incentives to utilise network capacity through MVNO agreements.
F22	eSIM capable devices are likely to become more prevalent, with the potential to reduce switching costs for both consumers, MNOs and MVNOs. However, there is the potential for competition to be suppressed if MNOs do not enable eSIMs or lock eSIM devices to their network.
F23	We may see more infrastructure sharing. Whether this enhances or suppresses competition will depend on how the arrangements are structured. We would expect to see infrastructure sharing proposals that raise potential competition concerns come to us for authorisation.

X12 In table X8 we set out our findings on regulated services and our planned reviews of those services over the next five years.

Table X8 Findings on regulated services

Finding number	Finding
F24	Our review of the current market conditions, and likely future developments, has not identified sufficient grounds for us to bring forward our planned reviews of regulated services. The scheduled reviews for these services are set out in Table 1 in Chapter 2.
F25	Backhaul services, whether metropolitan or between national network nodes, appear not to have constrained the competitiveness or development of mobile services, to date. However, we recognise the potential for bottlenecks to develop as mobile (eg, 5G), fibre technologies (eg, passive optical networking) and fibre regulation undergo a period of significant change.

Chapter 1 Introduction

Purpose of the study and legal framework

Purpose of the study

- 1.1 We have undertaken this study of mobile markets in New Zealand (study) to gain a better understanding of how the mobile market is currently performing and developing, and to consider how the mobile landscape may evolve in the future.¹
- 1.2 The mobile market study has helped us to:
 - 1.2.1 build an evidence base, so we can track relevant trends and identify whether there are any current or potential barriers to competition delivering benefits for consumers of mobile services in New Zealand;
 - 1.2.2 ensure that any future market interventions, if required, will be appropriate and proportionate;
 - 1.2.3 identify areas in the mobile market that might require more or less focus on an ongoing basis;
 - 1.2.4 inform policy makers, industry and consumers of the performance of the mobile market through regular monitoring and reporting of market performance and development;
 - 1.2.5 consider whether any regulatory measures (including deregulation) may be appropriate;
 - 1.2.6 consider whether to recommend legislative changes; and
 - 1.2.7 consider whether any investigations into potential breaches of the Fair Trading Act 1986, Part 2 of the Commerce Act 1986 (Commerce Act) or Credit Contracts and Consumer Finance Act 2003 may be required.

¹ Throughout this document we refer to the market in which mobile services are supplied. We do not consider that a formal definition of the dimensions of the relevant market or markets (as might be undertaken for the purposes of Part 2 or Part 3 of the Commerce Act) is required for this study.

Legal framework for the study

1.3 We have conducted this study under section 9A of the Telecommunications Act. Section 9A sets out that:²

- (1) In addition to the other functions conferred on the Commission by this Act, the Commission-
 - (a) must monitor competition in telecommunications markets and the performance and development of telecommunications markets; and
 - (b) may conduct inquiries, reviews, and studies (including international benchmarking) into any matter relating to the telecommunications industry or the long-term benefit of end-users of telecommunications services within New Zealand; and
 - (c) must monitor compliance with the Commission 111 contact code; and
 - (d) must make available reports, summaries, and information about the things referred to in paragraphs (a) to (c); and
 - (e) must monitor retail service quality in relation to telecommunications services; and
 - (f) must make available reports, summaries, and information about retail service quality in a way that informs consumer choice.
- (2) The functions in subsection (1)(d) and (f) do not require the Commission to release all documents that the Commission produces or acquires under this section or section 10A.

1.4 One of the ways we use section 9A studies is to gather information about, and develop our understanding of, telecommunications markets.

Timeline of the study

1.5 On 6 October 2017, we announced this study of mobile markets in New Zealand and invited interested parties to submit on our proposed Terms of Reference for the study.³

1.6 We received submissions from 2degrees, Blue Reach, Chorus, InternetNZ, New Street Research, Spark, Trustpower, Vocus, Vodafone and the Wireless Internet Service Providers Association of New Zealand (WISPA NZ). Public versions of the submissions are available on our website.

² The former section 9A was replaced on 13 November 2018 pursuant to section 25 of the Telecommunications (New Regulatory Framework) Amendment Act 2018 (2018 No 48). The replacement section 9A included new sections 9A(1)(e) and (f). The addition of these two clauses in section 9A did not affect this study.

³ Commerce Commission website, "Mobile market study", <https://comcom.govt.nz/regulated-industries/telecommunications/projects/mobile-market-study>.

- 1.7 Following the submissions on the Terms of Reference, we published our scope paper on 27 March 2018, and indicated that we would publish an Issues Paper and seek submissions.
- 1.8 We published our Issues Paper on 31 August 2018, and received submissions from 2degrees, Chorus, InternetNZ, Spark, Trustpower, Speedchecker Ltd, Venture Southland, Vocus, Vodafone and WISPA NZ . Public versions of the submissions are available on our website.
- 1.9 We published our Preliminary Findings paper on 16 May 2019, and received submissions from 2degrees, BAINZ Consulting, Chorus, InternetNZ, Nova, Sky, Spark, Trustpower, TUANZ, Vocus, and Vodafone. We also received cross-submissions from 2degrees, Chorus, Spark, Trustpower, Vocus, and Vodafone.

Purpose and structure of the Findings report

Purpose of the report

- 1.10 In this report, we present our findings and actions from our analysis of the performance and development of the mobile market. It also considers emerging trends and their potential impact on competition and market outcomes.
- 1.11 In preparing our findings, we have considered the submissions received in response to our Terms of Reference, Issues Paper, and Preliminary Findings paper, as well as information gathered from stakeholders, analysis from independent consultants, and other information that we have referenced throughout this paper.

Structure of the report

- 1.12 **Chapter 2** provides background on mobile networks and services, and the regulatory settings that currently apply to the mobile market.
- 1.13 **Chapter 3** describes the development of mobile services and competition using the following range of competition indicators:
 - 1.13.1 market structure and market shares, including by market segment;
 - 1.13.2 bundling of mobile services with other services;
 - 1.13.3 pricing, including how prices for mobile services have moved over time, and how prices in New Zealand compare to prices in other countries;
 - 1.13.4 usage trends, including how volumes of mobile calls, messaging services, and mobile data have changed over time, and the importance of mobile services to consumers;
 - 1.13.5 investment in mobile access infrastructure and spectrum;

- 1.13.6 profitability of mobile suppliers;
 - 1.13.7 quality of mobile services, including network coverage, availability, mobile data speeds, and customer service; and
 - 1.13.8 consumer satisfaction.
- 1.14 **Chapter 4** sets out a detailed exploration of three key issues we identified that may have an influence on delivering competitive outcomes for mobile consumers in New Zealand. These are:
- 1.14.1 spectrum – the allocation of, or access to, adequate spectrum is an important issue to sustain competition and to accommodate rapidly growing demand for mobile services;
 - 1.14.2 MVNO access – the competitive conditions for the provision of wholesale mobile services; and
 - 1.14.3 consumer engagement – the ability of consumers to make informed decisions and their willingness to take advantage of competition between suppliers of mobile services. Consumer engagement is important for driving competition and facilitating entry and expansion.
- 1.15 **Chapter 5** sets out our views on the state of competition in the mobile market, having considered the performance of the mobile market in New Zealand to date and the key issues which are likely to influence the further development of competition in the mobile market going forward.
- 1.16 **Chapter 6** discusses a selection of potential developments which may be relevant to future mobile competition and consumers.
- 1.17 **Chapter 7** sets out our examination of our regulatory settings and services in light of the performance and potential evolution of mobile services.

Chapter 2 Mobile networks and services

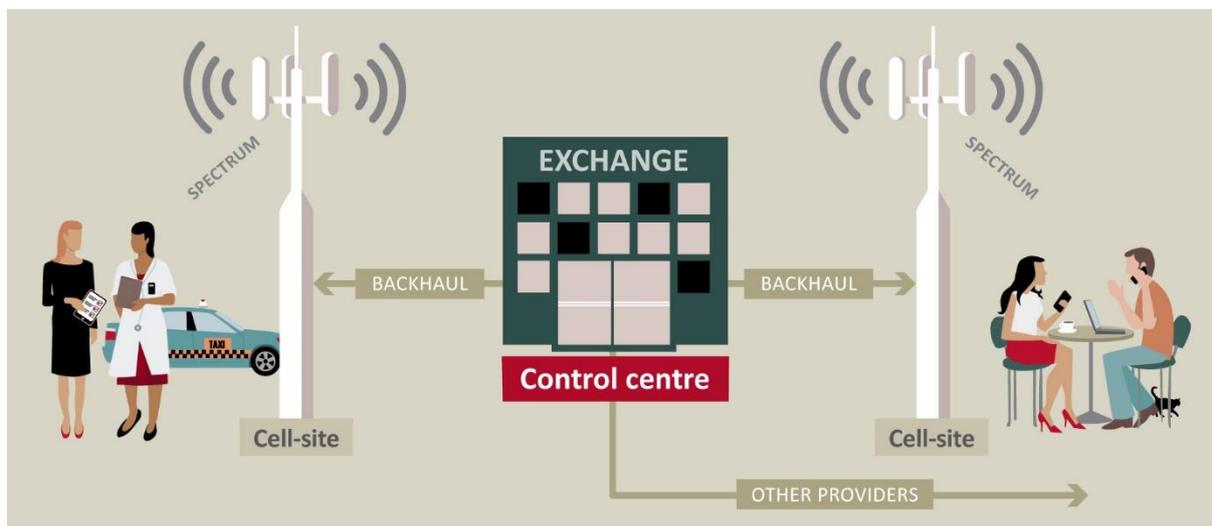
Purpose of this chapter

- 2.1 This chapter introduces and briefly describes the services within the scope of our study. We discuss the components of a generic mobile telecommunications network and the services that are supplied over it.
- 2.2 We distinguish between mobile services (where the signal connecting consumer devices is handed over between cell sites as the consumer moves around) and fixed wireless services (which are more location-specific).
- 2.3 We also summarise the different types of providers of mobile services and briefly outline the current regulatory framework.

Mobile networks

- 2.4 A mobile network (or a cellular network) is a communications network where the device is linked to a cell site by a wireless connection. Figure 1 illustrates the key elements of a mobile network.

Figure 1 Mobile network



- 2.5 In a mobile network, the overall area covered by the network is divided up into smaller areas called cells. Each cell is served by a fixed transmitter and receiver called a base station, which is located at the cell site. User devices such as cell phones or wireless routers use the base stations to communicate over the cellular network.
- 2.6 Mobile services and mobile network architectures have undergone significant evolution since mobile networks were first deployed. Depending on the specific

region of the world, different sets of standards were adopted for each network generation.

- 2.6.1 In Europe and most of the world, the Global System for Mobile (GSM) standard was used for the second generation (2G) of mobile systems. This later evolved to the Universal Mobile Telecommunications System (UMTS) for the third generation (3G) and Long Term Evolution (LTE) for 4G.
- 2.6.2 In the USA, the CDMAOne standard became the dominant 2G system which later evolved to CDMA2000 for 3G and LTE for 4G.
- 2.7 New Zealand MNOs currently use the GSM, UMTS and LTE systems for their 2G, 3G and 4G networks respectively. Most mobile services in New Zealand use 3G or 4G networks, with 2G either already decommissioned or being progressively phased out. Vodafone has recently announced that it will launch a 5G network in December 2019 in parts of Auckland, Wellington, Christchurch, and Queenstown.⁴
- 2.8 Radio spectrum is a critical input to the deployment of a mobile network. It refers to the radio frequencies allocated to the mobile industry and other sectors for communication over-the-air.
- 2.9 MNOs use a variety of spectrum bands to provide mobile services. Lower spectrum frequencies provide wider coverage and have better penetration (meaning they are better able to pass through objects such as walls) than higher spectrum frequencies. MNOs will use higher spectrum frequencies if they have exhausted the lower ones or need more capacity.
- 2.10 This has meant that MNOs typically use lower spectrum frequencies to serve rural locations, where coverage rather than capacity is a concern. Conversely, in urban areas where capacity (rather than coverage) is a concern, MNOs typically use higher frequency spectrum.
- 2.11 Backhaul (transport) is a generic term used to describe a point to point service where aggregated traffic is carried between different points ('nodes') in a network. In a mobile network, the MNO uses backhaul to connect its cell sites to other aggregation nodes such as mobile switching centres. Backhaul contributes to the service performance that an MNO's customers receive as it impacts on the capacity of the network and the latency of mobile services provided.⁵

⁴ See <https://news.vodafone.co.nz/article/vodafone-5g-launch-marks-day-one-new-ownership>.

⁵ Latency represents the reaction time of a network. It measures the time it takes for an end user's device to receive a response to a request.

- 2.12 The MNO may deploy its own backhaul infrastructure or may purchase backhaul from third parties. The backhaul requirements of a mobile network are typically based on fibre to ensure service performance levels, however wireless backhaul (digital microwave links) may be used in locations where fibre build out is prohibitively expensive, traffic is low and spectrum interference is not an issue.
- 2.13 Mobile networks interconnect with one another (and fixed networks) so that subscribers on one network are able to communicate with subscribers on other networks.
- 2.14 Mobile networks can also provide connectivity to IoT devices such as smart sensors (to measure, for example, temperature or motion) and smart meters (to measure, for example, electricity usage). IoT describes the network of physical and virtual objects accessed through the internet.⁶

Mobile services

- 2.15 Mobile services are communications services (voice, messaging, and data) which remain available to subscribers as they move around. Mobile services are delivered over a cellular mobile network to devices such as mobile handsets, or data devices such as tablets with in-built mobile connectivity, or ‘dongle’ devices using cellular modems (Figure 2). These devices contain a subscriber identity module (SIM) card, which authenticates the subscriber and allows them to connect to their chosen network.

Figure 2 Mobile devices



- 2.16 Mobile networks were initially designed to carry voice and messaging services. The emergence of 3G and, in particular, 4G mobile network technologies has made the

⁶ IoT devices can be connected via a mobile network or a specialised IoT network.

delivery of mobile data services at least as important as voice and messaging, providing for mobile broadband connectivity and OTT services.

- 2.17 These services are mobile in the sense that they can be used while moving around and are not tied to a specific fixed location of the consumer's device. As a consumer moves from the coverage area of one cell site to that of a neighbouring cell site, the signal to their mobile device is handed over between cell sites.
- 2.18 Mobile services are different to voice and broadband services that are delivered to a fixed location, including fixed-line services (delivered over copper, coaxial cable or fibre-based networks) and 'fixed wireless' services (delivered over a wireless network). These fixed-line and fixed wireless services typically offer a local WiFi connection to devices and enable mobile devices to use fixed-line data allowances (which are often unlimited) rather than mobile data.
- 2.19 From a consumer's perspective, a fixed wireless modem looks similar to a fixed-line modem. In both cases, consumers' devices are connected either through local WiFi or an Ethernet cable. The main difference is that behind the fixed wireless modem, the network connection is via a wireless network rather than a copper or fibre cable.
- 2.20 In our 2016 review of the Schedule 1 services,⁷ we noted that fixed wireless services provide similar functionality and features as a fixed-line broadband service at similar prices. We also found that mobile broadband services were considerably more expensive on a price per gigabyte (GB) basis than fixed wireless and fixed-line broadband services, and that the average amount of data usage was considerably higher for fixed broadband services than for mobile broadband. This remains the case. For example, Spark offers entry-level fibre and fixed wireless broadband services for the same retail price (\$75 per month for up to 120GB, or \$0.63 per GB). By comparison, Spark offers mobile broadband for \$69.99 for 12GB (\$5.83 per GB).⁸
- 2.21 The performance of broadband services delivered over different fixed-line and wireless network technologies varies, as shown in our Measuring Broadband New Zealand report.⁹ This suggests that fixed wireless services are currently competing with other fixed-line services in New Zealand, and in particular with

⁷ Commerce Commission, "Review of Designated and Specified Services under Schedule 1 of the Telecommunications Act 2001", (5 July 2016), para A24. The review considered 14 services, including mobile co-location and number portability, both relevant to mobile services. The process for reviewing Schedule 1 services is discussed further at para 2.42 below.

⁸ Spark website accessed September 2019.

⁹ Commerce Commission and SamKnows, "Measuring Broadband New Zealand", (13 June 2019).

DSL-based services.¹⁰ Mobile broadband services are likely to have a more complementary relationship at this stage.¹¹

- 2.22 Although we do not include fixed wireless services when assessing the current state of competition in mobile markets, we recognise that there are likely to be some economies of scope on the supply side which may affect decisions around entry and expansion by MNOs and MVNOs.
- 2.23 The ability to offer fixed wireless services will depend on spectrum holdings, in particularly the frequency bands required to deliver the capacity associated with fixed wireless services. We also note that fixed wireless services are likely to be an important feature of 5G deployments and possible MVNO product offerings.
- 2.24 Mobile services have typically been offered to consumers through two types of retail plans. Prepay plans are where consumers pay for services in advance, and on-account plans, also called post-pay, are where consumers pay at the end of each month of service.
- 2.25 On-account plans may be in the following forms:
- 2.25.1 fixed-term contracts, where the consumer signs up for a contract period of, for example, 12 or 24 months. In the past, these plans have typically been offered with a handset discount, and with the consumer facing an early termination charge to break the contract; and
 - 2.25.2 open term plans, where the consumer pays for the service on a month by month basis and is not locked into a fixed-term contract.
- 2.26 Mobile service providers in New Zealand have moved more towards offering open term plans for residential customers. These can be paired with monthly interest free payments for new handsets. Interest free payments spread the purchase price of a handset across a 12, 24 or 36-month period with the option to pay off the remaining amount in full at any point.
- 2.27 If the customer switches to another supplier, they are required to pay the balance on the handset and in some cases to repay any discount the customer received at the time of purchasing the handset. Spark's, Vodafone's and 2degrees' current

¹⁰ In its Annual Report 2019, Chorus also referred to competition from wireless networks contributing to a reduction in its copper-based broadband revenues (from ADSL and VDSL services). Chorus, Annual Report 2019, p 21.

¹¹ We note that the boundary between fixed services (fixed-line and fixed wireless) and mobile services may become increasingly blurred, eg as a result of WiFi.

handset promotional offers all appear to relate to open term plans with interest free payments.¹²

- 2.28 Both types of on-account plans lock consumers who pair their purchase of handsets into a payment period. However, by separating the cost of the handset from the cost of the mobile service, the open term plans make the handset portion of the cost more transparent, potentially allowing consumers more flexibility and choice when considering switching plans or providers.
- 2.29 The on-account market can be further split into residential and business segments.
- 2.30 Mobile plans are typically made up of a set 'bundle' of texts, calls, and data. The majority of plans have data caps; however, there have been moves recently towards plans that are marketed as having uncapped or 'unlimited' data. These uncapped data plans are not truly unlimited as they are subject to fair-use terms and MNOs severely throttle customers' speeds after a certain amount of data has been consumed. We are currently considering whether the use of the term 'unlimited' in describing these plans has the potential to mislead consumers and breach the Fair Trading Act 1986.
- 2.31 A number of the 'unlimited' plans currently available include a group or shared option, where the price per user reduces if additional users are added.

Mobile service providers

- 2.32 There are two types of service providers competing in the supply of mobile services to consumers.
 - 2.32.1 MNOs own key mobile network infrastructure (such as spectrum, cell towers, radio access and core network equipment) and supply mobile services to wholesale and retail customers. The ability to offer coverage is important due to the mobility of demand. An MNO can offer coverage by building its own national network or by sharing capacity (either through co-location or roaming). MNOs may launch sub-brands to target specific segments of the retail market.
 - 2.32.2 MVNOs are operators that provide mobile services to consumers but generally do not own licenced radio spectrum or much of the infrastructure required to provide mobile services. Instead, MVNOs rely on buying wholesale services from an MNO. The amount of control an MVNO

¹² As advertised online as of September 2019.

has over the services it offers will vary according to the nature of its agreement with its host MNO.

2.33 There are different types of MVNO operating models. These are typically described as ranging from a licensed reseller, which is the minimalist form of MVNO, through various intermediate models, to a ‘full’ MVNO (sometimes also referred to as a ‘thick’ MVNO). Under a full MVNO model, the MVNO invests in more of the key components of a mobile network. The MVNO models offer the MNO the opportunity to generate revenue from spare network capacity and to reach customer segments where the MVNO may have better reach.

Mobile regulatory settings in New Zealand

2.34 There are two types of regulated telecommunications services in Schedule 1 of the Telecommunications Act:

2.34.1 specified services, for which we Commission can determine non-price terms; and

2.34.2 designated services, where the Commission can determine price terms and non-price terms.

2.35 We set the terms of access for the regulated services through a Standard Terms Determination (STD).

2.36 Table 1 outlines the mobile services currently included in Schedule 1 of the Telecommunications Act.

Table 1 Specified and designated mobile services in Schedule 1¹³

Service	Type	Introduced	Next Schedule 3 review due	Subject to an STD
Mobile termination access service (MTAS)	Designated	23 September 2010	23 September 2020	Yes
Mobile co-location	Specified	19 December 2001	30 June 2021	Yes ¹⁴
Local and mobile number portability	Designated	19 December 2001	30 June 2021	Yes
National roaming	Specified	19 December 2001	20 September 2023	No

¹³ These services, and the reasons why they are listed in Schedule 1 of the Telecommunications Act 2001, are discussed further in Chapter 7.

¹⁴ The STD for mobile co-location was first introduced in 2008.

- 2.37 Mobile termination access services (MTAS) are the termination services a network operator needs to purchase to allow its subscribers to communicate with the subscribers of another mobile network.¹⁵
- 2.38 Mobile co-location is a service that enables an MNO to install mobile network transmission and reception equipment on the mast of another MNO.¹⁶
- 2.39 Local and mobile number portability allows customers to keep their number when switching between service providers.¹⁷
- 2.40 National roaming allows customers of one mobile network to use another network when they are outside their own service provider's coverage area.¹⁸
- 2.41 In November 2018 a new Part 7 was also added to the Telecommunications Act, which provides for the introduction of retail service quality obligations and powers, including the ability for the Commission to review existing industry codes and create codes of conduct that could apply to mobile services.

Changes to regulation

- 2.42 Schedule 3 of the Telecommunications Act sets out the process for altering regulated services in Schedule 1 of the Telecommunications Act.
- 2.42.1 Under clause 1(1) of Schedule 3, we can investigate whether to add a new service to Schedule 1, amend an existing service in Schedule 1, or remove a service from Schedule 1, if we are satisfied that there are reasonable grounds for an investigation into the matter.
- 2.42.2 Under clause 1(3) of Schedule 3, we must consider, at no more than 5 yearly intervals from when a Schedule 1 service came into force, whether there are reasonable grounds for commencing an investigation into whether that service should be deregulated (by removing it from Schedule 1).

¹⁵ Commerce Commission, "Review of MTAS as a designated service", (23 September 2015).

¹⁶ Commerce Commission, "Review of Designated and Specified Services under Schedule 1 of the Telecommunications Act 2001", [2016] NZCC 13, (5 July 2016).

¹⁷ Commerce Commission, "Review of Designated and Specified Services under Schedule 1 of the Telecommunications Act 2001", [2016] NZCC 13, (5 July 2016).

¹⁸ Commerce Commission, "Final decision on consideration of deregulation of national roaming", [2018] NZCC 14, 4 September 2018.

Chapter 3 Development of mobile services and competition

Purpose and structure of this chapter

Purpose

- 3.1 This chapter looks at the development of competition in the supply of mobile services in New Zealand. We focus on how competition has evolved, and whether there are any factors which may have affected market dynamics in recent years.

Structure

- 3.2 This chapter sets out:
- 3.2.1 our analysis of how the mobile market has performed in delivering outcomes to mobile consumers. This includes our examination of a number of key indicators: market structure and market shares, bundling of services, pricing, usage trends, investment, profitability, quality of mobile services, and consumer satisfaction; and
 - 3.2.2 the identification of a number of key issues which are in our view likely to underpin the further development of competition in the mobile market going forward. These are discussed in more detail in Chapter 4.

Analysis of the mobile market

- 3.3 During this study, we have examined how the retail market for mobile services has performed in New Zealand. We have taken into account the following:
- 3.3.1 information that we have previously summarised in our Issues Paper and our Preliminary Findings Paper;
 - 3.3.2 submissions received on the Issues Paper, and submissions and cross-submissions on the Preliminary Findings Paper;
 - 3.3.3 industry responses to our 2018 annual monitoring questionnaire; and
 - 3.3.4 updated price benchmarking results from Teligen.

- 3.4 There have also been other developments since we released our Issues Paper that are relevant to the mobile services market in New Zealand. These include:
- 3.4.1 Dense Air’s acquisition of spectrum and its plans to use small-cell technology to complement existing mobile coverage;
 - 3.4.2 Infratil’s acquisition of a 50% share in Vodafone New Zealand;¹⁹
 - 3.4.3 Trustpower’s announcement that they had signed an MVNO agreement with Spark; and
 - 3.4.4 Kogan’s announcement that they had signed an MVNO agreement with Vodafone. Kogan launched mobile services in New Zealand in September 2019.
- 3.5 In considering competitive conditions in the retail mobile market, we have examined a range of key competition indicators, which we discuss in the following sections. These indicators are relevant to how the retail mobile market has performed in terms of delivering outcomes to mobile consumers in New Zealand. Spark supported the use of a range of competition indicators in any market analysis, particularly given the rapid change observed in mobile markets.²⁰

Market structure and market shares

- 3.6 Retail mobile services are predominantly supplied by the three MNOs, Spark,²¹ Vodafone,²² and 2degrees.²³ In addition, several access-based MVNOs, Warehouse Mobile, Vocus, and Compass, serve a small share of mobile subscribers. Kogan Mobile has also recently started offering prepaid mobile services.
- 3.7 Table 2 summarises the number of mobile subscribers in New Zealand as of June 2018, based on responses to our 2018 annual monitoring questionnaire.

¹⁹ On 12 July 2019, Infratil announced that it and Brookfield Asset Management had received regulatory approvals from the Commerce Commission and the Overseas Investment Office to acquire Vodafone New Zealand.

²⁰ Spark, “Mobile market Study – Preliminary Findings: Submission” (28 June 2019), para 11.

²¹ Spark New Zealand is a publicly traded company.

²² As noted above, Vodafone New Zealand was acquired by Infratil and Brookfield Asset Management. The transaction completed on 31 July 2019. Infratil, “Completion of acquisition of Vodafone New Zealand”, (31 June 2019).

²³ 2degrees’ parent company is Trilogy International Partners.

Table 2 Mobile subscribers, 2018

Provider	Subscribers	%
Vodafone	2,591,092	40.5%
Spark (including Skinny)	2,423,532	37.9%
2degrees	1,313,497	20.5%
Total MNOs	6,328,121	98.9%
MVNOs (Warehouse Mobile, Vocus, Compass)	69,261	1.1%
Total	6,397,382	100.0%

Source: Responses to 2018 annual monitoring questionnaire

3.8 A number of parties have announced that they have secured wholesale agreements with MNOs, which have allowed them to, or will allow them to enter the mobile market in New Zealand as MVNOs.

3.8.1 Kogan Mobile has signed a commercial MVNO agreement with Vodafone.²⁴ Kogan launched mobile services in New Zealand in September 2019.²⁵

3.8.2 In November 2018, Trustpower announced that it had secured an MVNO agreement with Spark. This will enable Trustpower to start offering mobile and wireless broadband services.²⁶ Trustpower, which also supplies retail electricity, said it had nearly 400,000 customers in total, including 96,000 fixed-line telecommunications customers.²⁷

3.9 Nova has recently entered the mobile market through its acquisition of an existing MVNO, MegaTEL.²⁸

²⁴ Corinne Reichert, "Kogan Mobile launches off Vodafone in New Zealand." *ZDNet*, (4 June 2018). <https://www.zdnet.com/article/kogan-mobile-launches-off-vodafone-in-new-zealand/>.

²⁵ <https://www.zdnet.com/article/kogan-mobile-live-in-new-zealand-as-prepay-player>.

²⁶ Trustpower media release, "Trustpower pleased to announce wireless broadband and mobile services on the way for customers", 20 November 2018.

²⁷ Trustpower Annual Report 2019, p 38.

²⁸ Nova submission on the Preliminary Findings Paper, (28 June 2019), para 3.

- 3.10 MyRepublic has also announced that it intends to launch MVNO services in New Zealand.²⁹
- 3.11 Vocus currently has an MVNO agreement with Spark, and it has announced that it intends to test the wholesale market by issuing a request for proposal for its MVNO business.³⁰
- 3.12 In addition, towards the end of 2018, Dense Air acquired 70 MHz of spectrum in the 2.5 GHz band from Blue Reach and Cayman Wireless.³¹ Dense Air has informed us that it intends to use the spectrum to offer network extension services to the existing MNOs in New Zealand (similar to what it does in other countries), by using small-cell technology at the edge of cells to enhance coverage. Dense Air's entry is more complementary to the existing MNOs, as Dense Air does not intend to compete with existing mobile operators at either the retail or wholesale level.
- 3.13 Figure 3 shows trends in mobile market shares, including 2018 data from our latest annual monitoring questionnaire. As shown in Figure 3, over the last 10 years:
- 3.13.1 2degrees initially rapidly increased its share of total mobile subscribers, reaching 22% by 2013. Since 2013, 2degrees' share of subscribers has remained flat, with a small fall reported in 2018, to 21% (from 24% in 2017). As we noted in the 2018 Annual Monitoring Report, this was largely a result of the closure of its 2G network in early 2018,³²
 - 3.13.2 Vodafone's share of mobile subscribers has fallen steadily from around 53% in 2009 to 41% in 2018; and
 - 3.13.3 Spark's share of subscribers dropped from 46% in 2009 to 34% by 2013, recovering in recent years as Spark's Skinny brand, launched in early 2012, expanded.

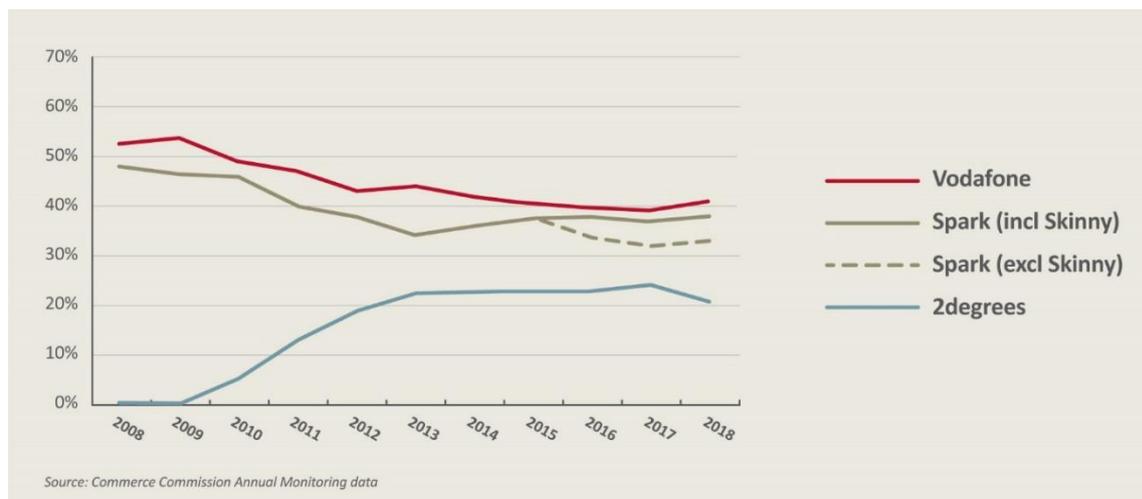
²⁹ Communications Day, "MyRepublic plans ANZ MVNO launch within a year", (26 June 2018), and Commerce Commission correspondence with MyRepublic.

³⁰ Vocus submission on the Preliminary Findings Paper, (28 June 2019), para 17.

³¹ See <http://denseair.net/dense-air-acquires-2-6-ghz-spectrum-assets-in-new-zealand/>.

³² Commerce Commission, "Annual Telecommunications Monitoring Report 2018 Key Facts", (18 December 2018), p 19.

Figure 3 Mobile market shares – total subscribers



- 3.14 Competition in the supply of mobile services has strengthened since the arrival of 2degrees in 2009. The retail market has become less concentrated as 2degrees has gained market share, particularly in the prepaid mobile services market segment but also more recently in the on-account residential mobile services market segment. TUANZ submitted that the continuing presence and expansion of 2degrees in the mobile market is critical.³³ We agree that the emergence of 2degrees has been important in the development of an increasingly competitive mobile market.
- 3.15 The prepaid mobile services segment is relatively low value; based on responses to our annual monitoring questionnaire, the average revenue per user (ARPU) for prepaid customers was \$12 per month in 2018, compared to ARPU for on-account subscribers of \$43 per month.
- 3.16 The business segment has remained more concentrated, and this led us to undertake a study in 2015 to see whether there were any barriers to expansion in this segment.³⁴ The 2015 study identified a number of key factors that business customers value when selecting a mobile provider. These include reliable coverage, good customer service, competitive pricing, the ability to offer bundles of services, and having an established reputation.

³³ TUANZ submission on the Preliminary Findings Paper, (30 June 2019), para 14.

³⁴ Commerce Commission, "Summary of business mobile market segment study" (30 March 2017) <https://comcom.govt.nz/regulated-industries/telecommunications/monitoring-the-telecommunications-market/topic-papers-other-reports-and-studies/business-mobile-market-study>.

- 3.17 The 2015 study also found a perception among business customers that 2degrees represented a lower cost, low quality brand with less coverage, although 2degrees' own business customers reported the highest levels of satisfaction.
- 3.18 In revenue terms, 2degrees' retail market share remained unchanged in 2018, while Spark's share increased slightly, and Vodafone's share continued to drop. 2degrees' on-account residential mobile revenues have been increasingly important, and this trend continued during 2018.
- 3.19 One factor influencing changes in market share is the level of porting activity. Approximately five percent of New Zealand mobile subscribers port their number each year. In the year ending June 2018, a total of 301,762 mobile numbers were ported.
- 3.20 A number of submissions have argued that the mobile market remains highly concentrated, with a high proportion of customers served by only 3 MNOs. According to these submitters, there is little competitive threat from MVNOs, whose collective market share is low in New Zealand.³⁵
- 3.21 As shown in Table 2 above, the share of mobile subscribers supplied by MVNOs in New Zealand is around 1%. However, MVNO market share is only one indicator of competition in a market. As noted earlier in paragraph 3.5, we have examined a range of indicators, including market shares more generally, as well as the indicators discussed below.
- 3.22 As discussed later in this report, we also consider that competitive conditions at the wholesale level have been improving in recent years, and that this is likely to be in large part due to 2degrees becoming more active in pursuing wholesale opportunities. This increased competition at the wholesale level has led to improvements in the commercial terms offered to MVNOs and potential MVNOs, allowing for new MVNO-based entry to emerge. This should lead to an expansion in the MVNO share where MVNOs are able to offer value to consumers.

³⁵ Vocus submission on the Preliminary Findings paper, (28 June 2019), p 2; BAINZ Consulting, submission on the Preliminary Findings paper, (28 June 2019), p 2; Nova, submission on the Preliminary Findings paper, (28 June 2019), para 7; Internet NZ submission on the Preliminary Findings paper, (28 June 2019), para 17.

Bundling

- 3.23 Bundling of multiple services can be beneficial for consumers by offering convenience of single billing or by offering cheaper prices when the services are purchased in a bundle than when purchased separately. However, potential competition concerns may arise if a service provider offers bundles of services that its competitors cannot replicate.
- 3.24 In the case of bundles involving mobile services, such foreclosure concerns may be mitigated by competition between the MNOs, unless an MNO offers a “must have” service that the others cannot replicate. In addition, bundling can increase consumer stickiness and customer acquisition costs which could potentially soften competition.
- 3.25 Chorus, Vocus and Trustpower submitted that the ability of non-MNOs to compete in retail markets may be constrained unless they are able to obtain wholesale access to mobile services on reasonable terms.³⁶ For example, according to Trustpower, the bundling of fixed-line and mobile services are continuing to grow, with a particular appeal to high-value customer segments. Trustpower noted that wholesale access to mobile services will be important for fixed-line only providers in order to avoid the MNOs foreclosing more valuable customer segments.³⁷ Analysys Mason made a similar point:³⁸
- The anticipated increase in popularity of bundles in New Zealand’s telecoms market, as well as the shift from prepaid to contract subscriptions, suggests that customers will increasingly choose to purchase domestic telecoms (and family member) bundles inclusive of mobile services. The convenience and savings offered by fixed–mobile bundling means that operators which lack a mobile product will find it much harder to attract high-value customer groups, regardless of the other telecoms, TV or utility products offered in the bundle.
- 3.26 Trustpower submitted that this differs materially from bundling fixed-line and electricity services, as the inputs required to supply these services are easily accessible due to there being open wholesale markets with regulated access for these services.³⁹
- 3.27 Consumers have benefitted from discounts by bundling fixed and mobile services. For example, in the past, the three MNOs have all offered discounted prices for

³⁶ Chorus submission on the Issues paper, (26 October 2018), para 16; Vocus submission on the Issues paper, (26 October 2018), para 89-94; Trustpower submission on the Issues paper, (26 October 2018), p 15.

³⁷ Trustpower submission on the Issues paper, (26 October 2018), para 3.5.2; Trustpower submission on the Preliminary Findings Paper (28 June 2019), p 8.

³⁸ Analysys Mason, “Final Report for Trustpower: MVNO aspects of the Commission’s mobile market review” (28 October 2018), p 23.

³⁹ Trustpower submission on the Issues paper, (26 October 2018), para 3.5.3.

residential fixed broadband services if a qualifying mobile subscription is also purchased.

- 3.28 According to the responses to our 2018 annual monitoring questionnaire the volume of fixed broadband subscriptions that attracted such a discount accounted for less than 20% of the fixed broadband services supplied by the MNOs, although it has been increasing.
- 3.29 The 2018 Consumer NZ survey results indicate that 73% of respondents do not purchase a product that bundles their mobile service with other services.^{40, 41} Of those who do purchase mobile services as part of a bundle, the main services included with mobile are fixed-line broadband services and content.
- 3.30 The ability to bundle mobile connectivity with content was ranked relatively low by respondents to Analysys Mason's Connected Consumer Survey in New Zealand. According to the 2018 survey results, the most important factors that influence mobile consumers' choice of a mobile plan include lower pricing of mobile services (52%), data allowances (33%), value (24%), network coverage (16%), and data speeds (15%).⁴² Bundling mobile with music was an influential factor for 8% of respondents and bundling with video content was influential for 2%.
- 3.31 Spark has moved away from offering discounts to customers who purchase both fixed and mobile services from Spark. For example, Spark noted that its new 'Unplan' broadband plan does not offer a bundled discount, and that it expects the number of bundled discounts involving mobile to fall over time as customers migrate to its new broadband plans. According to Spark,⁴³

It is unclear whether bundling of mobile services may be a concern in the future. But bundling can only be a concern where the bundle includes an element with market power and there isn't effective competition for the bundle, i.e. a fixed/mobile bundle may compete against a fixed/electricity bundle. If anything, communications markets are expected to be more competitive over time, leading us to conclude that bundling of mobile services is unlikely at this time to represent a potential competition problem.

⁴⁰ Consumer NZ, Telco Consumer Survey 2018. Survey conducted in December 2018, select results published February 2019.

⁴¹ We note that the actual proportion of respondents who do not purchase a bundle of mobile and other services may be higher than 73%. Some Skinny respondents said they bought a mobile bundle with broadband. However, Skinny does not offer bundles of mobile and broadband services. The respondents may be buying both mobile and broadband services from Skinny, but it is not a 'bundle' in that the services are not tied or billed together.

⁴² Analysys Mason, "Connected Consumer Survey 2018: mobile customer satisfaction in Australia and New Zealand", slide 11.

⁴³ Spark submission on the Issues paper, (26 October 2018), para 46.

- 3.32 Although Spark has moved away from such bundling, the other MNOs are continuing to offer bundled discounts across fixed and mobile services, and as noted above, the aggregate number of discounted services has been gradually increasing.
- 3.33 At this stage, it appears that non-MNOs, such as Vocus, Trustpower, and Nova (who has recently acquired an MVNO, MegaTEL) have been able to offer, or expect to offer, similar or new bundles, for example involving fixed and mobile services along with other services such as electricity.
- 3.33.1 Vocus offers discounts to residential customers who purchase both fixed-line broadband and mobile from Vocus.⁴⁴
- 3.33.2 In announcing its intention to offer mobile services, Trustpower said that mobile is increasingly important to its customers, and that its wholesale agreement with Spark will enable it to offer a wider range of bundles to its customers.⁴⁵

Pricing

- 3.34 Mobile consumers typically purchase bundles of mobile services which provide a monthly allowance of minutes, texts, and data.
- 3.35 Throughout this study, we have had regard to the benchmarking of mobile prices undertaken by Teligen on behalf of the Organisation for Economic Cooperation and Development (OECD), which we use in our annual monitoring reports.⁴⁶ In order to examine how prices for mobile services have moved over time and how prices in New Zealand compare to other countries, Teligen's benchmarking considers the cost of filling various usage baskets. Teligen's price benchmarking of mobile services is based on the two largest MNOs in each country in the OECD and allows prices to be compared across a range of usage baskets. Teligen updates its benchmarking three to four times each year.

⁴⁴ Slingshot website accessed September 2019. The discount offered by Slingshot amounts to a \$300 credit over 12 months.

⁴⁵ Trustpower media release, "Trustpower pleased to announce wireless broadband and mobile services on the way for customers", (20 November 2018).

⁴⁶ See for example, Commerce Commission, "Annual Telecommunications Monitoring report: 2018 Key facts", (18 December 2018), Table 3.

- 3.36 A number of submissions have commented on the pricing of mobile services in New Zealand.
- 3.36.1 2degrees: New Zealand has a small population and challenging topography, making it relatively expensive to supply mobile services. Despite this, since 2degrees' entry, New Zealand's ranking in terms of mobile pricing has improved compared to other OECD countries.⁴⁷
- 3.36.2 2degrees: Benchmarking can overlook important differences. For example, many Australian mobile plans are for fixed-term contracts; in New Zealand, 2degrees introduced open term plans and monthly repayment options for handsets.⁴⁸
- 3.36.3 Spark: Referred to open term plans in New Zealand versus fixed-term contracts in Australia, and that some of the Australian high usage plans referred to in the Issues Paper included promotional bonus data allowances and minimum 12-month contract terms.⁴⁹
- 3.36.4 Spark: Recent competitive developments in New Zealand have led to further improvements in value for money for high usage plans. Spark has increased the threshold on its 'unlimited' plans from 22GB to 40GB. Spark noted that other operators offer group plans with up to 40GB per person for as low as \$40 per month. Such plans compare favourably to other countries, including Australia.⁵⁰
- 3.36.5 NERA: The OECD's August 2018 benchmarking shows New Zealand prices below both the OECD average and Australia for low and high usage baskets (including unlimited calls + 20GB, and unlimited calls + unlimited data). NERA also said that it was important to consider price trends over time, that prices per GB have been declining steeply in New Zealand, and that the emergence of high usage plans (20GB and 'unlimited' data) and price reductions for these plans in recent years is consistent with competition occurring as demand develops.⁵¹
- 3.36.6 Vodafone: New mobile plans introduced by the New Zealand MNOs in 2017 with high or unlimited data allowances have brought New Zealand much more in line with other OECD countries. For example, Vodafone

⁴⁷ 2degrees submission on the Issues paper, (October 2018), p 12.

⁴⁸ 2degrees submission on the Issues paper, (October 2018), p 12, 28.

⁴⁹ Spark submission on the Issues paper, (26 October 2018), para 27.

⁵⁰ Spark submission on the Preliminary Findings paper, (28 June 2019), para 9c.

⁵¹ NERA, "Competition in the New Zealand Mobile Market", (26 October 2018), para 38-40.

submitted that New Zealand's 'unlimited' plans compare well to comparable offers in Australia.⁵² Data caps continue to increase in New Zealand, with Vodafone increasing the cap on its Red+ plans to 40GB, and 2degrees increasing the speed threshold on its 'unlimited' plans to 40GB.⁵³

3.36.7 Vocus: In the absence of disruptive offers from MVNOs, MNOs have little incentive to compete down high prices of larger data plans, despite increasing demand for data.⁵⁴

3.36.8 BAINZ Consulting: There is little price differentiation in New Zealand, and the pricing for mobile services in New Zealand are higher than Australia.⁵⁵

3.36.9 Sky: Although prices for low and medium usage bundles in New Zealand seem to compare well with other OECD countries, New Zealand consumers pay more for high usage bundles than in other countries, particularly Australia. It is difficult to reconcile this with the finding that conditions for effective competition exist.⁵⁶

3.36.10 Chorus: It is not clear why higher volume mobile bundles are expensive in New Zealand compared to other countries. In New Zealand, there are significant price differences between mobile broadband and fixed wireless services, suggesting cross-subsidisation and insufficient competition for mobile.⁵⁷

3.37 Mobile plans offering higher volumes of data are becoming increasingly popular and important. As an example, the total number of residential on-account subscribers purchasing bundles of voice, SMS, and data allowances of 3GB or more increased from 133,000 subscribers in 2016, to 319,000 subscribers in 2017. This has continued to increase, to 497,000 subscribers in 2018. According to Spark, the predominant trend in the retail market is the shift towards 'unlimited' data plans, including plans that can be shared across several users.⁵⁸

3.38 To reflect the increasing importance of high usage plans, our 2018 Annual Monitoring Report included a number of higher usage baskets (including unlimited

⁵² Vodafone submission on the Issues paper, (26 October 2018), p 29.

⁵³ Vodafone submission on the Preliminary Findings paper, (28 June 2019), p 4.

⁵⁴ Vocus submission on the Issues paper, (26 October 2018), para 96.

⁵⁵ BAINZ Consulting submission on the Preliminary Findings paper, (28 June 2019), p 1.

⁵⁶ Sky submission on the Preliminary Findings paper, (28 June 2019), para 10.1, 14.

⁵⁷ Chorus submission on the Issues Paper, (26 October 2018), page 7; Chorus submission on the Preliminary Findings paper (28 June 2019), p 3.

⁵⁸ Spark cross-submission on the Preliminary Findings paper, (19 July 2019), para 10.

calls and 20GB) when comparing mobile prices in New Zealand and other countries. During this study, we have had regard to a range of baskets, including the unlimited calls and 20GB data basket, when comparing mobile pricing.

- 3.39 NERA’s submission on the Issues Paper claimed that the OECD’s August 2018 benchmarking shows that New Zealand performs better than both the OECD average and Australia, including for high usage baskets. However, we note that in Teligen’s initial results for its August 2018 benchmarking, which were discussed by NERA in its submission, Teligen had incorrectly reported a price for New Zealand based on a Skinny plan with a data allowance that did not fill the 20GB basket.^{59 60} When corrected, New Zealand’s price for that basket remained 23% higher than Australia, but below the OECD average.
- 3.40 We note that Teligen no longer considers New Zealand’s ‘unlimited data’ plans (where speed is throttled once a threshold has been reached) to qualify as unlimited data plans, and so New Zealand no longer appears in the Teligen results for that basket.
- 3.41 Table 3 shows the May 2019 results for the same baskets that we used in the 2018 Annual Monitoring Report. For comparison, the figures in brackets are the August 2018 results reported in our 2018 Annual Monitoring Report.

Table 3 Latest Teligen benchmarking results, May 2019

Mobile phone services basket	NZ rank in OECD*	May 2019 price, NZD PPP (Aug 2018)			NZ % price variance from	
		NZ	Aust.	OECD average	Aust.	OECD average
30 calls + 500MB	10/37 (8/36)	17 (16)	13 (22)	24 (26)	29%	-32%
100 calls + 2GB	17/37 (15/36)	28 (28)	13 (22)	35 (41)	115%	-22%
300 calls + 5GB	21/37 (17/36)	48 (45)	13 (34)	48 (56)	270%	-1%
unlimited calls + 20GB	20/33 (16/31)	72 (65)	26 (53)	86 (109)	178%	-17%

* A ranking of 1 indicates the lowest price for that basket in the OECD.

Source: based on Teligen benchmarking results, May 2019.

⁵⁹ NERA, “Competition in the NZ mobile market) submission on the Issues Paper”, (26 October 2018), p 14.

⁶⁰ The plan was Skinny’s \$46 Combo, which has 12GB data.

3.42 As discussed further in the following section, the average volume of data used by mobile consumers in New Zealand was 2GB per month in 2018, although this is growing strongly. For the 2GB and 5GB baskets, the New Zealand price reported by Teligen is currently at or below the OECD average, as illustrated in Figure 4 and Figure 5.

Figure 4 Mobile prices (100 calls + 2GB)

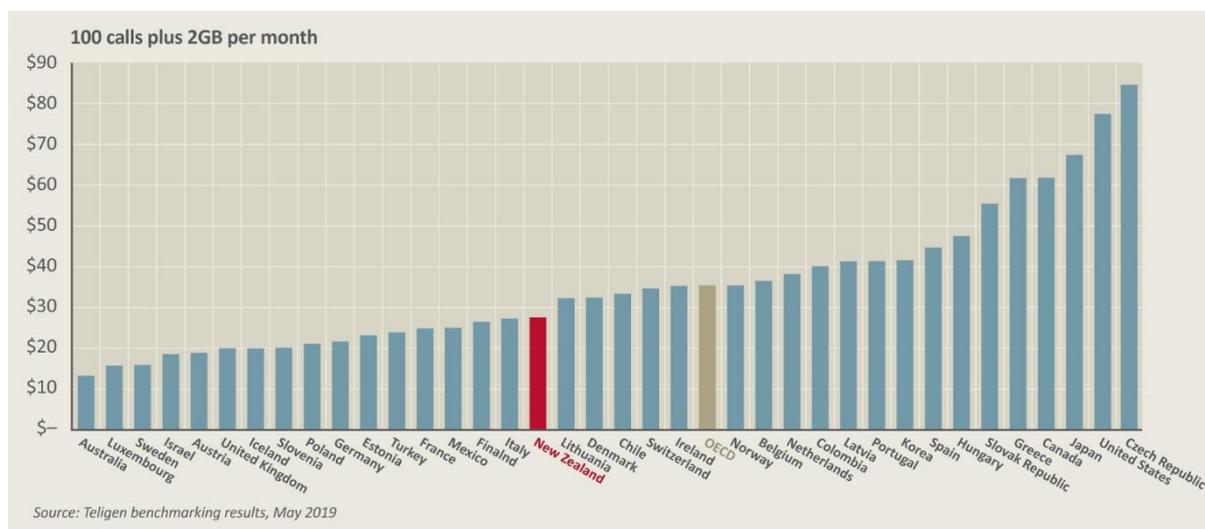
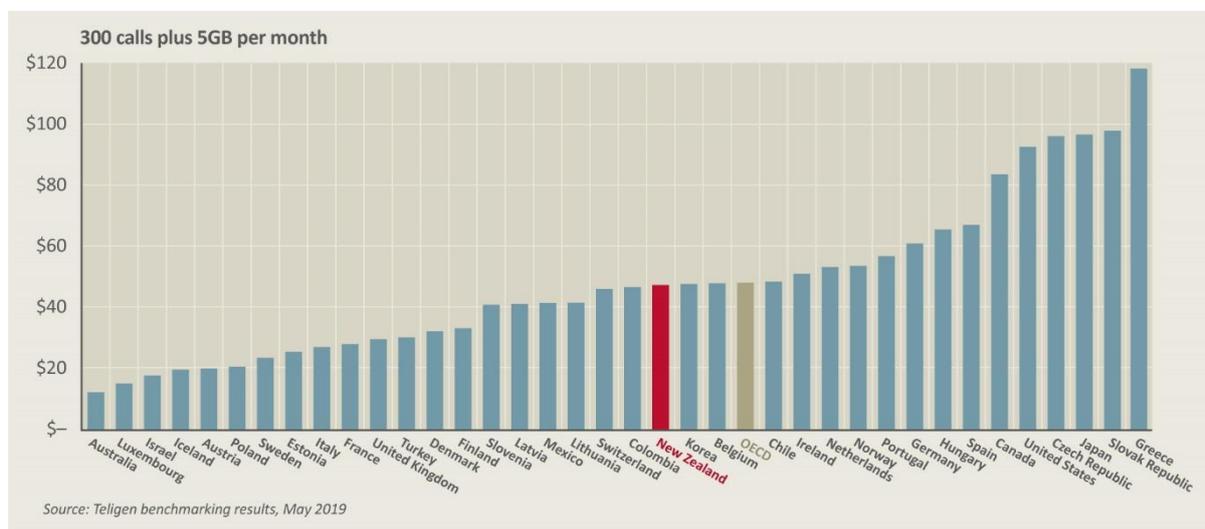


Figure 5 Mobile prices (300 calls + 5GB)



3.43 For the larger usage baskets, the results shown in Table 3 indicate that mobile prices in New Zealand are relatively high when compared to Australia but remain below the average for the OECD. In fact, New Zealand’s ranking has slightly deteriorated since the August 2018 results (used in our 2018 Annual Monitoring Report). For example, in the unlimited calls + 20GB basket, the August 2018 results reported New Zealand as 16th most expensive out of 31 countries; in the February and May 2019 results, New Zealand’s rank had fallen to 20th out of 33 countries.

- 3.44 The reason for this appears to be the withdrawal by Skinny of its sub-brand ('Skinny Direct') in respect of new customers towards the end of 2018. Skinny Direct's retail plans were the cheapest plans in New Zealand for some of the higher usage baskets used by Teligen. For example, for the unlimited calls + 20GB basket, the cheapest plan in New Zealand had been Skinny Direct's 25GB plan (NZ\$65 per month), which appeared in Teligen's benchmarking results in May and August 2018.
- 3.45 In Teligen's May 2019 benchmarking, Skinny Direct's plans no longer appear, with the cheapest plan in New Zealand now Skinny's NZ\$66 plan (per 4 weeks), which is equivalent to NZ\$71.50 per month. While below the OECD average for this basket (NZ\$86), this remains significantly higher than the price in Australia (NZ\$26), as shown in Table 3.
- 3.46 Although the New Zealand prices for the higher usage baskets shown in Table 3 are relatively high compared to Australia, it should be noted that the New Zealand plans reported by Teligen provide more data than is required to fill the Teligen baskets. For example, in the unlimited calls + 20GB basket, Skinny's plan provides for 33GB of data each month (the Australian plan reported by Teligen for this basket provides for 20GB of data).
- 3.47 We have also compared specific retail mobile plans available in New Zealand and Australia. The New Zealand MNOs do not offer fixed-term contracts to residential customers, with retail plans available on a pay-monthly basis. In Australia, Optus and Vodafone currently offer both pay-monthly mobile plans as well as 12-month contract plans, with greater value offered under the latter. Telstra has recently moved away from mobile plans with fixed-term contracts, and now offers plans on a pay-monthly basis only.⁶¹
- 3.48 Table 4 summarises the highest data plans currently offered by each MNO in Australia and New Zealand.⁶²

⁶¹ Telstra media release, "Telstra says goodbye to lock-in plans and introduces new build-your-own mobile plans", (25 June 2019).

⁶² Prices of the Australian plans are converted to NZ\$ using PPP rates derived from the Teligen benchmarking (May 2019).

Table 4 Mobile prices (price per GB), highest data plans offered

Pay-monthly	Vodafone Australia	Telstra	2degrees	Skinny	Spark	Vodafone
Price (NZ\$)	\$56	\$103	\$85	\$83	\$80	\$80
Data (GB)	15	150	40	43	40	40
Price per GB	\$3.76	\$0.68	\$2.13	\$1.93	\$2.00	\$2.00
National calls and SMS	unlimited	unlimited	unlimited (incl to Aus)			

12-month contract	Optus	Vodafone Australia
Price (NZ\$)	\$81	\$67
Data (GB)	120	120
Price per GB	\$0.68	\$0.56

Source: operator websites, accessed September 2019. Prices are for the highest data plans offered by each MNO in Australia and New Zealand

3.49 In the Preliminary Findings paper, we noted that for pay-monthly plans, the value offered by the New Zealand MNOs was similar to the plans available in Australia, although considerably higher value was available in Australia for customers who are prepared to sign up for a 12-month term. While it remains the case that the price per GB remains higher in New Zealand for the largest bundles, there have been a number of recent market developments which have resulted in improved value for higher usage mobile consumers in New Zealand.

3.49.1 In April 2019, 2degrees introduced a shared ‘unlimited’ mobile plan, offering 40GB for \$85 per month. The average price per subscriber drops as additional subscribers are added. A maximum of four people are able to subscribe to the plan, at which point the average price per subscriber is \$40 per month for 40GB. In addition, 2degrees offered a short-term promotion in June 2019, offering a 50% discount on most of its pay-monthly prices for three months.

3.49.2 In May 2019, Skinny added a 40GB plan for \$77, renewing every four weeks. When adjusted to a monthly basis, the Skinny plan offers 43GB for \$83.

- 3.49.3 As Spark noted in its submission on the Preliminary Findings paper, it recently increased the threshold at which speeds are throttled on its ‘unlimited’ mobile plans, from 22GB to 40GB.⁶³ According to Spark, there has been a significant shift towards such plans in the New Zealand market.⁶⁴
- 3.49.4 Vodafone has also recently increased the threshold on its ‘unlimited’ plans, from 22GB to 40GB.
- 3.49.5 In September 2019, Kogan Mobile commenced offering prepaid mobile plans with unlimited calls and SMS, and up to 32GB per month. Subscribers can pay in advance for 30 days, 90 days, or 365 days.
- 3.50 We also note that the various plans shown in Table 4 have different inclusions. For example, some of the New Zealand plans include subscriptions to content (such as Netflix and Spotify), while the Australian plans often include services such as picture messaging, international calls, and in some cases international roaming.
- 3.51 Spark submitted that New Zealand MNOs have moved away from fixed-term contract plans following feedback from consumers and the Commission.⁶⁵ Our concerns with contracts were with the one-sided nature of the conditions and unfair penalties for termination that existed in contracts at the time. Unfair contract terms can apply to any kind of contract, whether fixed or open term.
- 3.52 The use of fixed-term contracts *per se* is not necessarily problematic. As noted above, consumers in Australia have the choice of fixed-term contracts and pay-monthly plans. Consumers who are prepared to sign up for a 12-month term can receive higher value compared to the pay-monthly plans.
- 3.53 In the Consumer NZ survey, respondents were asked what is the one thing that their mobile service provider could do to increase overall satisfaction. Having an ‘open term’ plan was the least important feature, with better pricing, cheaper data, and better service quality being the most important.⁶⁶ This suggests that consumers might be willing to enter fixed-term contracts in order to get better value, although as noted above, the pay-monthly plans available in New Zealand

⁶³ Spark submission on the Preliminary Findings paper, (28 June 2019), para 9c.

⁶⁴ Spark cross-submission on Preliminary Findings paper, (19 July 2019), para 10.

⁶⁵ Spark submission on the Issues paper, (26 October 2018), para 27b. Spark has since clarified to the Commission that they were referring to our comments on the management of fixed term contracts, particularly the actions we have taken against parties who included what we considered may be potentially unfair contract terms within a fixed term contract structure.

⁶⁶ Consumer NZ, Telco Consumer Survey 2018.

continue to offer improved value to consumers through higher data thresholds as well as lower prices for shared plans.

- 3.54 A number of submissions earlier in our study (on the Issues Paper) responded to Analysys Mason’s observation that mobile ARPU has been increasing in New Zealand in recent years. NERA claimed that the Analysys Mason result appears to have been driven by an anomaly in the Global System for Mobile Communication Association (GSMA) data reported for Vodafone.⁶⁷
- 3.55 Vodafone submitted that the GSMA data includes fixed and mobile revenues, which spiked in 2013 as a result of Vodafone’s acquisition of TelstraClear (which included high-value fixed-line enterprise customers). Vodafone also submitted that the GSMA data for 2016 contained an error. Vodafone referred to the revenue and subscriber data supplied to us as part of the annual monitoring questionnaire, which shows ARPU declining since 2010.⁶⁸
- 3.56 Figure 6 summarises the estimated mobile ARPU based on the responses to our annual monitoring questionnaires. This indicates that mobile ARPU in New Zealand has been flat (or shows a slight decline if handset revenues are excluded, as shown by the dotted line).
- 3.57 The increase in ARPU in 2012/13 appears to have been driven by an increase in Spark’s ARPU, which in turn was related to the closure of its CDMA network. As we have previously noted, the closure of the CDMA network in 2012 resulted in a reduction in the number of Spark’s subscribers.⁶⁹ Spark reported that the loss of lower value prepaid subscribers resulted in an increase in its mobile ARPU in 2013.⁷⁰

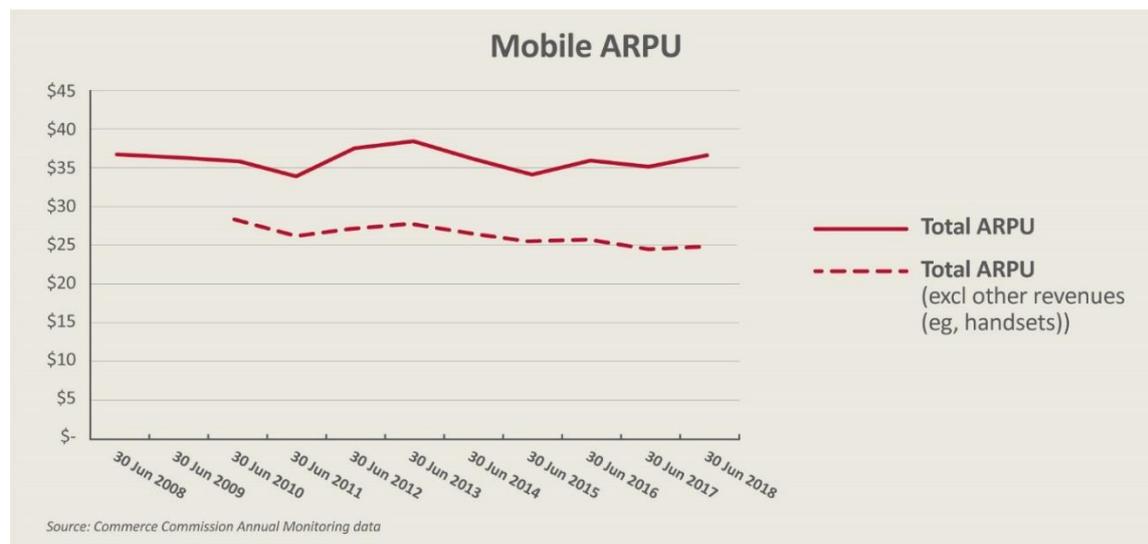
⁶⁷ NERA, “Competition in the New Zealand Mobile Market”, (26 October 2018), para 54.

⁶⁸ Vodafone submission on the Issues paper, (26 October 2018), p 6-7.

⁶⁹ Commerce Commission, “Annual Telecommunications Monitoring Report 2013”, (21 May 2014), p 23-24.

⁷⁰ Spark Annual Report 2013, p 53.

Figure 6 Mobile ARPU, 2008-2018



3.58 As noted in the following section, the average monthly volume of mobile-originated calling minutes per mobile subscriber has been increasing over this period, as has the average volume of mobile data per mobile subscriber.

3.59 These ARPU and usage trends are consistent with falling prices for mobile services over time.

3.60 A further indication of how prices of mobile services have changed over time can be seen by comparing Teligen’s benchmarking results for a consistent basket. For example, Teligen has reported benchmarking results for a basket of 900 calls and 2GB since 2012.

3.60.1 In 2012, the cheapest mobile plan in New Zealand which filled this basket was a Telecom plan offering calls and 2GB for \$139 per month.

3.60.2 In 2019, the cheapest mobile plan is a Skinny plan offering calls and 5GB for \$39 per month.⁷¹

3.61 Chorus has submitted that there appear to be significant differences in prices per GB between mobile broadband and fixed wireless services. Chorus submitted that this may reflect insufficient competition for mobile services, which may be cross-

⁷¹ The Skinny plan is Skinny’s \$36 Combo, which renews every four weeks. This price is adjusted by Teligen to be equivalent to a price per month. The monthly equivalent data allowance would be 5.4 GB per month.

subsidising fixed wireless services.⁷² However, we note that fixed wireless services are location-specific, providing connectivity to consumers at fixed locations.

- 3.62 As a result, the capacity required to support such services can more easily be directed to those fixed locations. In contrast, for mobile broadband services, demand is mobile as consumers are likely to be moving around, including between cell sites. This mobility of demand makes mobile services more challenging to deliver in terms of network management.

Usage trends

- 3.63 Responses to our 2018 annual monitoring questionnaire show that mobile voice minutes continued to grow during 2018, both in aggregate and on a per subscriber basis. SMS volumes continued to decline as consumers increasingly favour OTT-based messaging services. This is particularly evident from Analysys Mason's Connected Consumer Survey 2018, which found the following:⁷³

3.63.1 81% of smartphone users in New Zealand use OTT communication and social media services, with penetration particularly high in younger cohorts (94%-95% among users aged below 34); and

3.63.2 messaging services were the most common OTT service used by respondents.

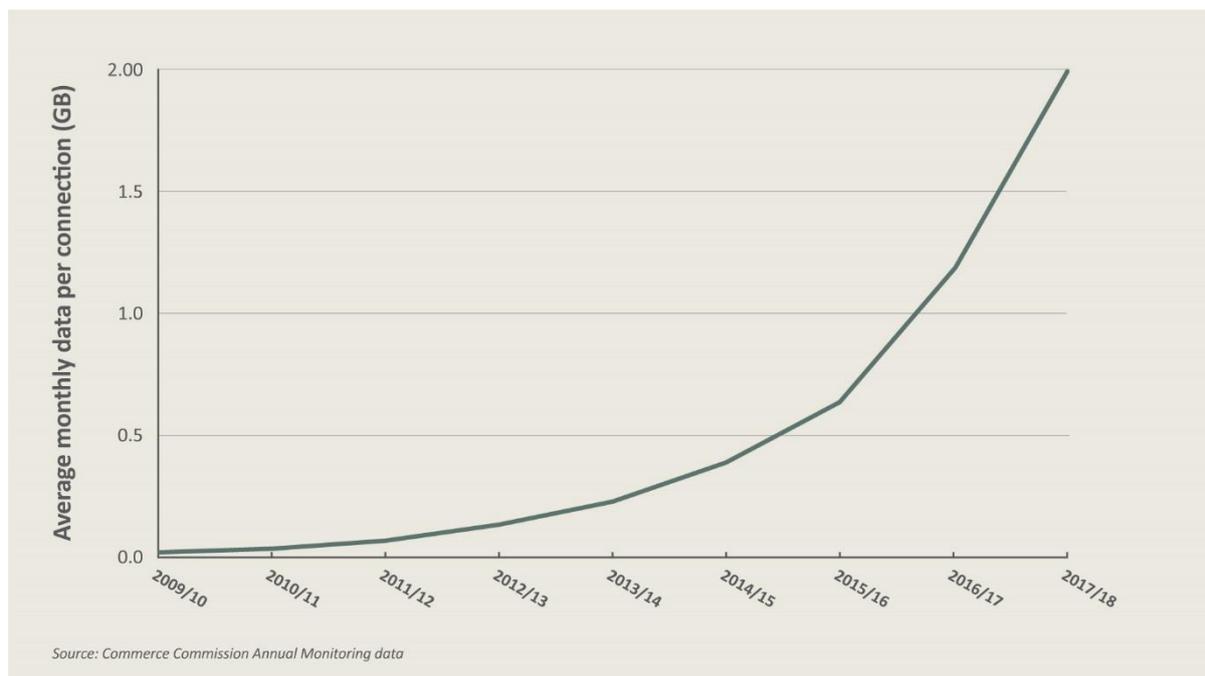
- 3.64 In our 2018 Annual Monitoring Report, we noted that the volume of data used by mobile consumers continued to grow strongly in 2018, with the average volume of mobile data per connection reaching 2GB per month in 2018, up from 1.2 GB in 2017, as shown in Figure 7. The OECD has reported that average data usage in New Zealand has increased by 130% between 2016 and 2018.⁷⁴

⁷² Chorus submission on the Issues paper, (26 October 2018), p 7; Chorus submission on the Preliminary Findings paper, (28 June 2019), para 5.5.

⁷³ Analysys Mason, "Connected Consumer Survey 2018: OTT communication services in Australia and New Zealand", slides 7, 10.

⁷⁴ OECD, "1.13 Mobile data usage per mobile broadband subscription" (December 2018), at <http://www.oecd.org/sti/broadband/broadband-statistics/>.

Figure 7 Mobile data usage



- 3.65 According to Consumer NZ's survey of mobile consumers, 82% of respondents used mobile broadband in 2018, up from 77% in 2017.⁷⁵
- 3.66 Submissions have generally been unanimous that there has been strong growth in demand for mobile data, and that this is expected to continue. Chorus noted that growth in demand for mobile data could be tempered to the extent that prices for mobile data in New Zealand are high.⁷⁶ Spark noted that the amount of data consumed by mobile customers in New Zealand has increased on average by around 77% per year since 2010, with significant growth experienced on its network. Spark also noted that all MNOs have launched large data bundle plans, including group plans, which are proving to be popular.⁷⁷
- 3.67 2degrees submitted that voice and SMS traffic were likely to decline, as calls and messaging services become increasingly data-based. This will contribute to demand for larger data allowances, putting pressure on network capacity and the need for more spectrum.⁷⁸

⁷⁵ Consumer NZ, Telco Consumer Survey 2018.

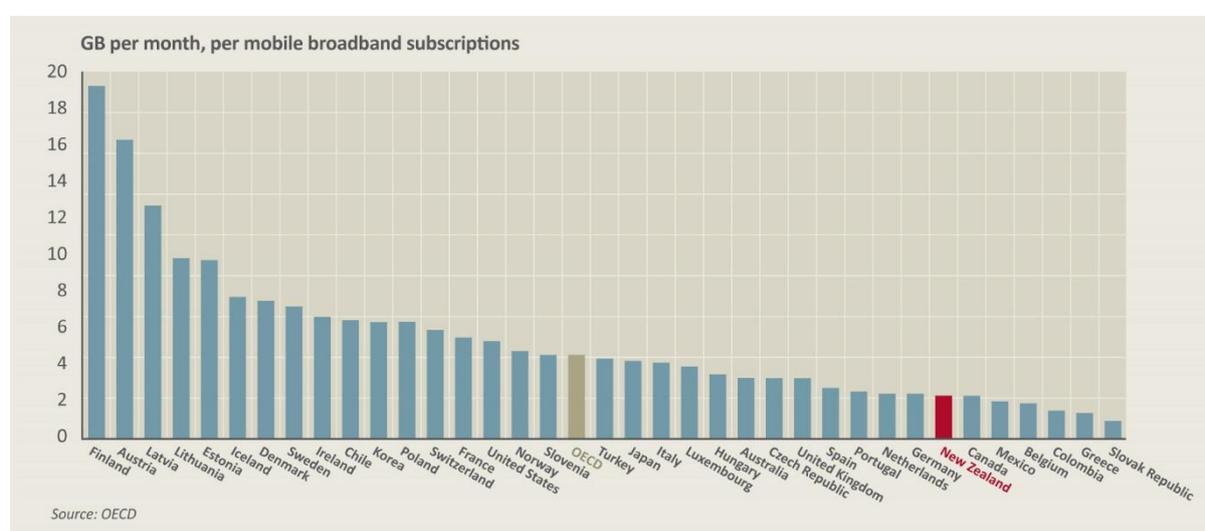
⁷⁶ Chorus submission on the Issues paper, (26 October 2018), p 7.

⁷⁷ Spark submission on the Preliminary Findings paper, (28 June 2019), para 8, 9.

⁷⁸ 2degrees submission on the Issues paper, (October 2018), p 14.

- 3.68 Vodafone and Spark also noted that there must be sufficient spectrum made available to meet the expected growth in mobile data.⁷⁹
- 3.69 Although the average amount of mobile data per connection has been increasing strongly in New Zealand, New Zealand’s average appears to be relatively low compared to other OECD countries, as shown in Figure 8. This may in part reflect relatively high prices for larger bundles of mobile voice and data in New Zealand, although other factors may also explain this, such as the availability and quality of fixed broadband networks. As Vodafone has submitted, New Zealand has relatively high fixed network usage compared to countries such as Finland, and New Zealanders appear to spend more time connected to WiFi networks on the mobile devices than other countries.⁸⁰

Figure 8 Average mobile data per mobile subscription (December 2018)⁸¹



Investment

- 3.70 The MNOs have continued to invest in their mobile networks, both in terms of network upgrades and expansion of coverage. The Government has also contributed to the expansion of infrastructure in rural areas through the Rural Broadband Initiative (RBI) and Mobile Black Spot Fund (MBSF).
- 3.71 NERA submitted that despite rapid growth in mobile and fixed wireless data usage, Spark’s mobile users have experienced increased quality (in terms of speed, packet

⁷⁹ Vodafone submission on the Issues paper, (26 October 2018), p 29; Spark submission on the Issues paper, (26 October 2018), p 40.

⁸⁰ Vodafone submission on the Preliminary Findings paper, (28 June 2019), p 7.

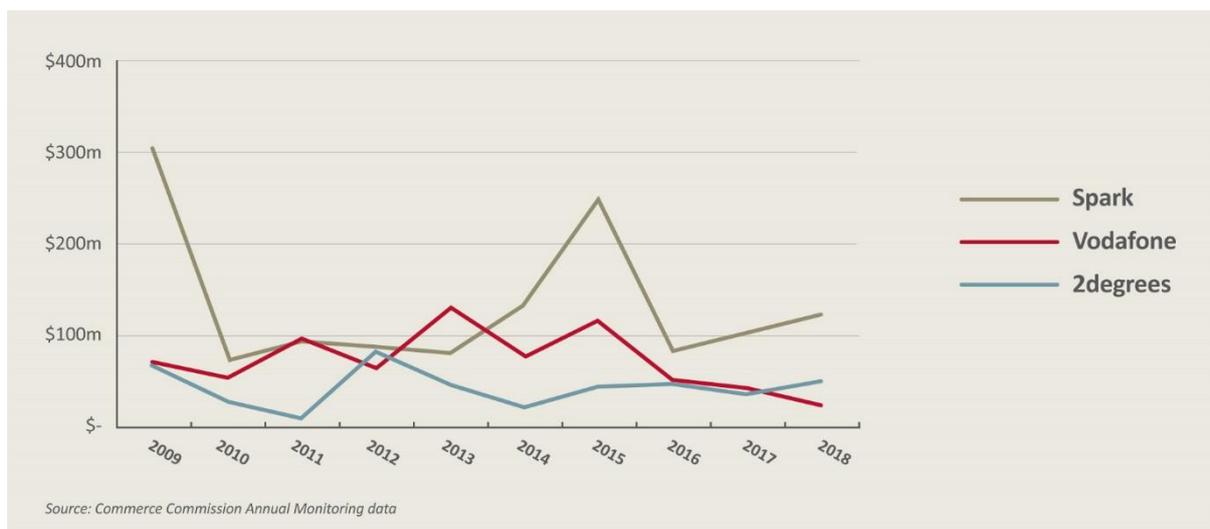
⁸¹ Commerce Commission generated chart based on OECD, “1.13 Mobile data usage per mobile broadband subscription” (December 2018), at <http://www.oecd.org/sti/broadband/broadband-statistics/>.

loss, round trip time). This indicates that Spark has continued to invest in capacity ahead of demand.⁸²

3.72 2degrees referred to the investment that it had undertaken to date in product and network deployment, and that it must continue to invest further, including at the wholesale level.⁸³ The MNOs submitted that competition between MNOs has resulted in increased investment at the network, technology, and services level, as well as in customer service quality.⁸⁴

3.73 We have updated the data on investment in mobile access made by each of the MNOs, as reported in responses to our annual monitoring questionnaire. This is shown in Figure 9. Each MNO has in most years invested up to \$100 million per annum in their mobile networks. The investment peaks appear to relate to Telecom’s investment in its new wideband code-division multiple access (W-CDMA) network in 2009, and investment by the three MNOs in 700 MHz spectrum in 2015.^{85,86}

Figure 9 Investment in mobile access, by MNO



⁸² NERA, “Competition in the New Zealand Mobile Market”, (26 October 2018), para 74-84.

⁸³ 2degrees submission on the Issues paper, (26 October 2018), p 7.

⁸⁴ 2degrees submission on the Issues paper, (26 October 2018), p 7; Vodafone submission on the Issues paper, (26 October 2018), p 3.

⁸⁵ Telecom’s Annual Report 2009 refers to capital expenditure during 2009 of \$300M on its new XT mobile network.

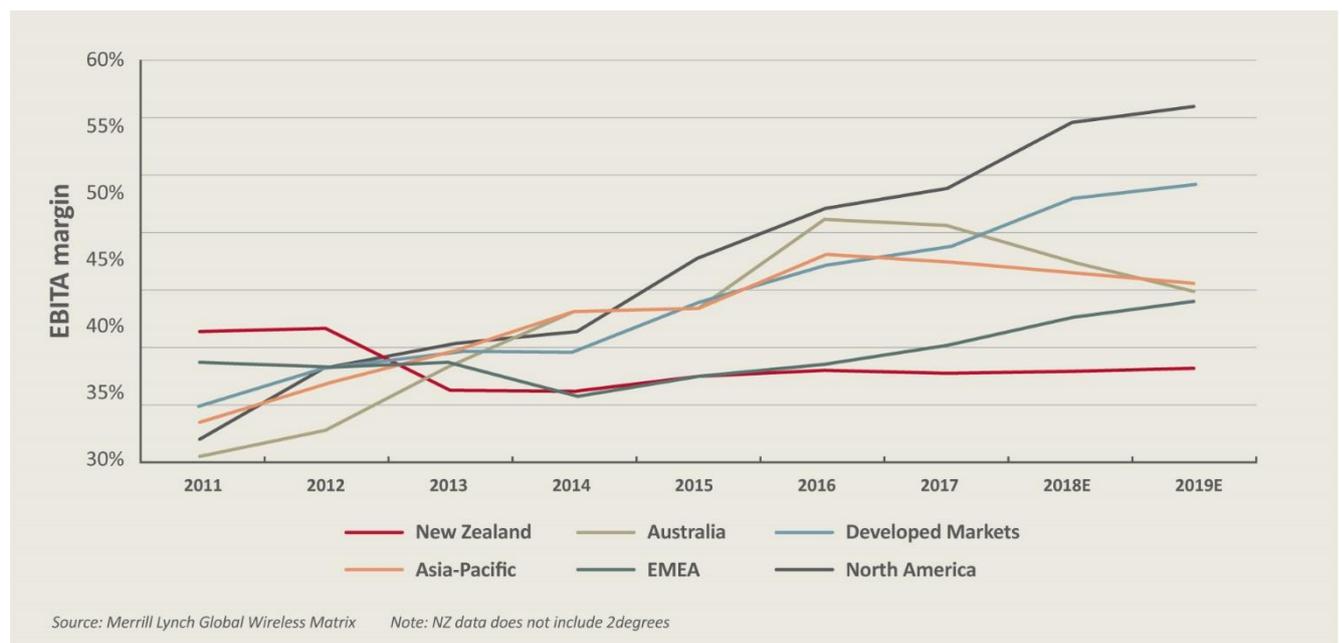
⁸⁶ The results of the 700 MHz auction were announced in June 2014, with Spark acquiring 2x20MHz for \$158M; Vodafone acquiring 2x15MHz for \$68M; and 2degrees acquiring 2x10MHz for \$44M; MBIE, “700 MHz auction: notice of provisional results” (19 June 2014).

3.74 A number of submissions argued that regulatory uncertainty can impact the ability to fund much-needed new capacity, and that mobile operators are facing investment in 5G technology at a time when mobile revenues are flat and profitability is constrained.⁸⁷ Spark submitted that MNOs are continuing to invest to meet growing demand and new services, and referred to its investment programme to augment network capacity and to develop new services.⁸⁸ 2degrees also submitted that issues such as the reserve prices and payment terms for new spectrum will influence investment in network deployment.⁸⁹

Profitability

3.75 Several submissions on the Issues Paper referred to profitability. For example, NERA included the following diagram, and observed that “New Zealand has an EBITDA⁹⁰ margin which is consistently under the world average and this gap is increasing over time.”⁹¹

Figure 10 EBITDA margin over time



⁸⁷ Spark submission on the Issues paper (26 October 2018), p 2; 2degrees submission on the Issues paper, (26 October 2018), p 24.

⁸⁸ Spark submission on the Preliminary Findings paper, (28 June 2019), para 9b.

⁸⁹ 2degrees submission on the Issues paper, (26 October 2018), p 5.

⁹⁰ Earnings Before Interest, Tax, Depreciation and Amortisation.

⁹¹ NERA “Competition in the New Zealand Mobile Market”, (26 October 2018), para 61.

- 3.76 The NERA submission was not explicit on whether the EBITDA margins reflect pure mobile operations, or mobile operations that are integrated with fixed-line operations. Spark has subsequently informed us that the Merrill Lynch EBITDA data shown in Figure 10 is based on Merrill Lynch estimates of margins for mobile operations, where segmented results for fixed and mobile operations are not separately reported.
- 3.77 However, it is not clear how Merrill Lynch has derived the segmented mobile margins, and whether its estimates take into account the structure of the New Zealand telecommunications sector.⁹² While the EBITDA margins shown above may be consistent with a competitive mobile market, the lack of transparency has limited the weight we placed on the Merrill Lynch results.
- 3.78 The EBITDA margins shown in Figure 10 above for New Zealand appear to relate to Vodafone and Spark only and sit at around 35%. The EBITDA and revenues reported by Trilogy for 2degrees over the last three years is summarised in Table 5. This indicates an EBITDA margin of 14% in 2015, increasing slightly to 16% in 2017 and 2018.

Table 5 2degrees EBITDA, revenues, and EBITDA margins⁹³

	Year ended 31 December			
	2015	2016	2017	2018
Revenues (US\$'000)	\$ 393,055	\$ 488,969	\$ 520,042	\$ 556,410
EBITDA (US\$'000)	\$ 55,455	\$ 80,923	\$ 85,307	\$ 90,396
EBITDA margin	14%	17%	16%	16%
EBIT (US\$'000)	\$3,022	\$ 21,487	\$ 24,502	\$24,236

Source: Trilogy International Partners Consolidated Financial Statements as of December 31, 2017 and 2018

- 3.79 The EBITDA margin for 2degrees (16%) appears to be considerably lower than the estimated EBITDA margins shown in Figure 10 for the two larger MNOs in New Zealand. This may in part reflect measurement issues with the Merrill Lynch

⁹² For example, with structural separation of the fixed-line broadband networks in New Zealand, Spark and Vodafone purchase wholesale fixed broadband services from Chorus and the other LFCs. This may result in higher operating expenditure (and lower capital expenditure) for Spark and Vodafone, compared to the other developed markets shown in Figure 10.

⁹³ See <http://www.trilogy-international.com/>.

estimates.⁹⁴ However, it is also likely to reflect differences in scale between the three MNOs.⁹⁵ It may also partly reflect 2degrees' higher mix of prepaid subscribers.

Quality of mobile services

3.80 Mobile service quality has several dimensions, including network coverage, mobile broadband speeds, service availability, and customer service. In terms of New Zealand's performance on these, a number of observations can be made.

3.80.1 Network coverage: All MNOs offer mobile services to more than 97% of population (4G to 95%).

3.80.2 Mobile broadband speeds: Speeds are increasing with the deployment of 4G LTE. In February 2018, OpenSignal reported New Zealand's 4G download connection speed of 33 Megabits per second, which was 8th fastest out of 88 countries.⁹⁶

3.80.3 Availability: 3G or 4G availability in New Zealand ranks well, with OpenSignal ranking New Zealand 6th out of 95 countries.⁹⁷ New Zealand's ranking in terms of availability of 4G services is lower, although increasing. In February 2018, OpenSignal reported 4G availability in New Zealand of 69% (65th out of 88 countries); in May 2019, 4G availability had increased to 76% (57th out of 87 countries).^{98, 99}

3.80.4 Customer service: Consumer NZ's mobile consumer survey found that the larger MNOs perform relatively poorly when compared to 2degrees and Skinny in terms of customer service waiting times and overall customer satisfaction.¹⁰⁰

⁹⁴ As noted above, there may be an issue with the segmentation of the fixed and mobile operations of Spark and Vodafone.

⁹⁵ This is consistent with the findings of McKinsey that profitability of MNOs correlates strongly with market share. See McKinsey, "Middle East and Africa: Telecommunications industry at cliff's edge", (2016), Exhibit 14.

⁹⁶ OpenSignal, "The State of LTE (February 2018)". OpenSignal is a company that specialises in tracking mobile network performance from the consumer's perspective.

⁹⁷ OpenSignal defines 'availability' as the percentage of time that users can connect to the service. This differs from population or geographic coverage, both of which omit the time dimension.

⁹⁸ OpenSignal, "The State of Mobile Network Experience: Benchmarking mobile on the eve of the 5G revolution", (May 2019).

⁹⁹ As discussed later, Dense Air intends to use recently acquired spectrum to enhance the coverage of mobile services in New Zealand.

¹⁰⁰ Consumer NZ, Telco Consumer Survey 2018.

- 3.81 A number of parties have submitted on the issue of service quality. According to 2degrees, mobile service quality has a number of dimensions, including those we identify above. 2degrees supported the monitoring of retail service quality as long as it avoids unnecessary costs and allows for meaningful comparisons between operators. 2degrees also noted that monitoring mobile performance is more complex than fixed-line services due to the greater sharing of resources.¹⁰¹
- 3.82 On behalf of Spark, NERA submitted that although the roll-out of 4G started later in New Zealand compared to Canada, the US, UK, and Australia, New Zealand's 4G coverage expanded quickly to reach levels similar to these countries.¹⁰²
- 3.83 Spark and Vodafone have both referred to New Zealand ranking 2nd highest in the GSMA Global Mobile Connectivity Index (GMCI).¹⁰³ The GMCI is comprised of four equally weighted sub-indices, measuring:
- 3.83.1 mobile infrastructure (including mobile coverage, speeds, spectrum);
 - 3.83.2 affordability of mobile services (mobile tariffs as a % of GDP per capita);
 - 3.83.3 'consumer readiness' (literacy, educational enrolment etc); and
 - 3.83.4 content (movies, music, games and sports).
- 3.84 Vodafone noted that New Zealand ranked 5th best in terms of infrastructure, 7th in terms of affordability and 10th in terms of network performance.¹⁰⁴
- 3.85 Vodafone argued that quality metrics should focus on the experience of consumers rather than arbitrary measures of technology used (such as the Commission's focus on 4G availability). Vodafone submitted that the New Zealand mobile networks perform well, and that fixed-line services are more problematic in terms of complaints than mobile.¹⁰⁵
- 3.86 In our view the availability measures relate very much to the experience of consumers. If a service is not available, it compromises the consumer experience. The availability metrics provide an additional measure of service quality to coverage and speed by introducing a time dimension to the assessment of service quality. However, we agree that availability alone does not provide a full view of quality.

¹⁰¹ 2degrees submission on the Issues paper, (26 October 2018), p 14-15.

¹⁰² NERA "Competition in the New Zealand Mobile Market", (26 October 2018), para 69-71.

¹⁰³ Spark submission, 26 October 2018, para 52; Vodafone submission, (26 October 2018), p 3.

¹⁰⁴ Vodafone submission on the Issues paper, (26 October 2018), p 4.

¹⁰⁵ Vodafone submission on the Issues paper, (26 October 2018), p 30.

- 3.87 Spark submitted that OpenSignal’s 4G availability metric does not measure coverage as such, but the period of time a device connects to a 4G rather than a 3G network. According to Spark, this can be influenced by various factors, including the MNO’s network configuration (to prefer connection to 3G or 4G), service performance, the extent to which voice calls are delivered using 3G or Voice over Long Term Evolution (VoLTE), and the capability of the device to connect to various 4G bands.¹⁰⁶
- 3.88 Spark has also said that its network monitoring indicates that Spark customers connect to its 4G network for a significantly higher proportion of time than suggested by OpenSignal.¹⁰⁷
- 3.89 The reasons for the difference in 4G availability reported by Spark and OpenSignal are not clear. For example, it might be that Spark performs relatively well in terms of 4G availability, although we currently do not have 4G availability results for the other MNOs. As discussed later in the ‘Consumer engagement’ section, access to information on mobile performance (including data speeds, service availability, and coverage) is an area that could be improved through the wider consumer and retail service quality work that we are prioritising.
- 3.90 Although New Zealand’s mobile networks generally appear to perform well in terms of most measures of quality, publicly available information on New Zealand’s overall performance in terms of 4G availability (measuring the proportion of time that end users can connect to 4G services) ranks relatively poorly.
- 3.91 As noted by NERA, New Zealand initially lagged behind other countries on 4G coverage, although currently it is broadly comparable. For example, in Australia Telstra and Optus report current 4G coverage of 99% and 97% respectively, which is slightly higher than the 96%-98% reported by the New Zealand MNOs.¹⁰⁸

Consumer satisfaction

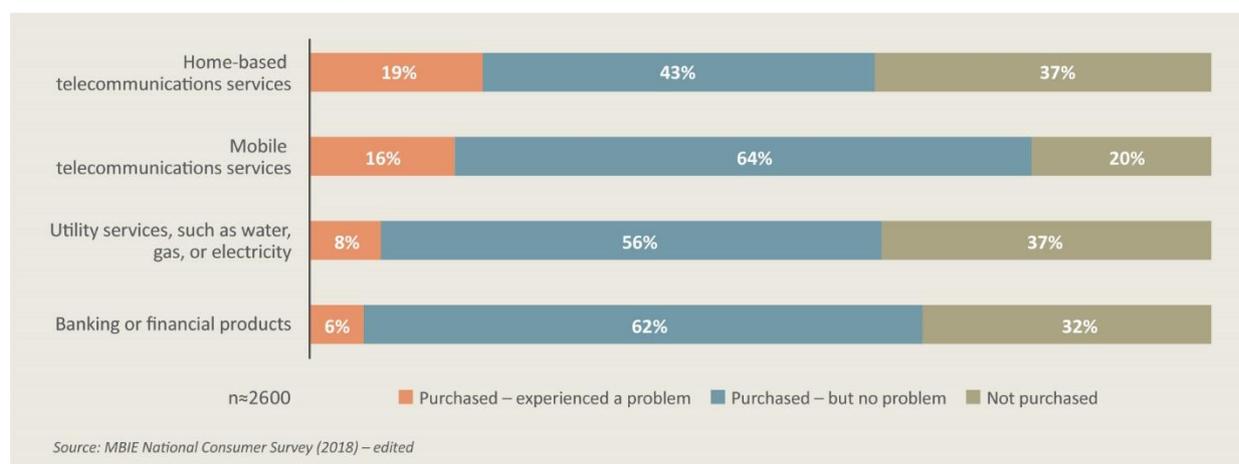
- 3.92 The consumer experience with mobile services is mixed. As shown in Figure 11, consumers experience fewer problems with mobile telecommunications than with fixed-line telecommunications but experience more problems with mobile services than utilities or banking services.

¹⁰⁶ Spark submission on the Preliminary Findings paper, (28 June 2019), para 15-16.

¹⁰⁷ Spark submission on the Preliminary Findings paper, (28 June 2019), para 19.

¹⁰⁸ Telstra Annual Report 2018, p 9; and <https://www.optus.com.au/shop/mobile/network>.

Figure 11 Purchasing experiences in the past two years by product or service category



3.93 While fixed-line telecommunications create more complaints than mobile services, many issues are industry wide (eg, billing, contracts, and sales tactics).¹⁰⁹

3.94 Satisfaction levels with mobile services are above fixed-line telecommunications services and energy retailers but below banks (see Table 6).

Table 6 Consumer satisfaction by sector¹¹⁰

Industry	Overall Satisfaction with Suppliers			
	Largest Supplier	Best Supplier	Worst Supplier	Industry Average
Retail - home tech	65%	85%	54%	68%
Retail - mobile handsets	59%	83%	54%	62%
Banking	54%	87%	54%	60%
Mobile	51%	77%	51%	56%
Fixed-line telecommunications	49%	68%	43%	51%
Energy	46%	66%	46%	51%

Source: Derived from Consumer NZ (Telecommunications 2018, Banking 2019, Retail 2018, Energy 2019).¹¹¹

¹⁰⁹ Complaints made to the Commerce Commission.

¹¹⁰ Red numbers show the lowest industry in each satisfaction category, green numbers the highest. % is the percentage of respondents who said they were very satisfied with their service provider.

¹¹¹ Results for the banking, energy and telco sectors are from Consumer NZ's nationally representative surveys of the New Zealand population; results for the retail home tech and mobile handset categories are from Consumer NZ member surveys.

Findings on the development of the mobile market

F1	Market shares among the three national MNOs have become more evenly balanced over time, particularly in the prepaid and residential on-account segments.
F2	Ongoing investment in the mobile networks has seen all three MNOs investing in new generations of mobile technology and 2degrees completing the roll-out of its national network.
F3	All three national MNOs are reporting profits, although profit margins vary, reflecting differences in market share and mix of customers.
F4	The three national MNOs appear to perform well on most technical measures of quality, although there is some evidence that the quality of coverage for 4G services (as measured by availability) may be relatively low compared to other countries.
F5	Prices of mobile services have been falling. Prices for low and medium usage bundles compare well with other OECD countries. Prices for higher usage bundles remain relatively expensive, especially when compared with Australia, although recent market developments have resulted in ongoing innovation and improved value for consumers in relation to higher usage bundles.
F6	Usage of mobile calls and in particular mobile data has continued to increase in recent years, with the amount of mobile data used per subscriber more than doubling over the last two years. Although average data usage appears to be relatively low compared to other countries, this may be due to a number of factors, including pricing of higher usage bundles and the availability and quality of fixed networks (including WiFi hotspots) in New Zealand.

Our views on the key issues in the mobile market

- 3.95 As discussed in the above sections, competition in the mobile market has been developing to the point where there are now three national MNOs, as well as a small number of MVNOs. Further MVNO-based entry has also been announced. The performance of the mobile market has generally improved in terms of delivering competitive outcomes to consumers, through lower prices, increasing quality, and greater choice of services.
- 3.96 Based on the above, as well as information provided in submissions received throughout the course of this study, there are three key issues which are likely to influence the further development of competition in the mobile market going forward. These issues relate to spectrum, MVNOs, and consumer engagement. Together these will potentially have a significant influence on conditions for competition in the mobile market.
- 3.97 We briefly discuss the importance of each of these issues below, before turning to each of them in more detail in Chapter 4.

Spectrum

- 3.98 Radio spectrum is a critical input used in the deployment of a mobile network. The type and amount of spectrum held by the MNOs will affect the way in which they deploy their networks, and the capacity and services they can offer to retail and wholesale customers.
- 3.99 The three MNOs currently have asymmetric holdings of spectrum, particularly in the sub-1 GHz bands and in some of the higher frequency bands. 2degrees submitted that it holds 18.5% of key mobile spectrum, compared to 40% held by Spark and 30% held by Vodafone.¹¹²
- 3.100 According to 2degrees, it has been able to compete and expand since its entry, although its ability to continue to do so will depend on acquiring sufficient new spectrum, particularly due to the rapid increase in demand for mobile data. Throughout this study, Vodafone and Spark have also referred to the importance of adequate spectrum being released in the 3.5 GHz band to support the development of 5G networks.
- 3.101 We note that 2degrees has now largely completed the roll-out of its national network, for which it has incurred significant fixed and sunk costs. As long as each of the MNOs has sufficient capacity, which will be influenced by their spectrum

¹¹² 2degrees submission on the Issues Paper, (October 2018). The balance of 11% was held by Blue Reach at the time of 2degrees' submission on the Issues Paper.

holdings, they are likely to face strong incentives to compete at both the retail and the wholesale level.

- 3.102 The allocation of spectrum will continue to have a very important influence on competitive conditions in downstream markets, including the mobile market, and on how competition evolves in the future.¹¹³

MVNOs

- 3.103 During this study, we have sought to better understand the performance of the retail market, and whether we should consider intervening to promote additional MVNO-based entry. If competition in the retail market is found to be delivering poor consumer outcomes which are not expected to improve, it may be appropriate to consider intervening at the wholesale level (such as through regulation of MVNO access) to promote entry. Any such intervention would need to be compared to what would happen in the absence of regulation – for example, whether competition at the wholesale level is likely to lead to sustainable MVNO-based entry.
- 3.104 In this regard, we have sought views on whether competitive conditions at the wholesale level have changed as a result of 2degrees having completed its national network, and how wholesale competition is expected to evolve over the next two-three years.
- 3.105 In response, a number of parties have provided extensive submissions throughout this study on competitive conditions at the wholesale level. Several submissions noted that MVNOs have brought a range of benefits in other countries, such as greater variety of mobile services, price competition, and increased options for bundling of mobile services with other services which in turn may be of growing importance for the effectiveness of competition in telecommunications markets.
- 3.106 Submissions from Spark, Vodafone and 2degrees generally claim that they are increasingly competing to attract MVNO business, pointing to the entry of Warehouse Mobile as well as the (then) anticipated new entry by Trustpower and Kogan Mobile.
- 3.107 For such MVNO-based competitors, the availability of MVNO access on reasonable terms will influence their ability to expand and evolve in retail markets. Until recently, there appears to have been limited competition between MNOs to host

¹¹³ The importance of competition objectives for spectrum allocation has been recognised in many overseas jurisdictions. See for example, BEREC, “BEREC report on practices on spectrum authorization, award procedures and coverage obligations with a view to considering their suitability to 5G”, (6 December 2018); ACCC “Allocation limits advice for the 3.6 GHz spectrum allocation”, (July 2018).

MVNOs, and this may have resulted in commercial MVNO agreements which have not been conducive to MVNO entry and expansion.

- 3.108 However, there has been some evidence provided in submissions and elsewhere that the level of wholesale activity has been increasing in recent years. Some parties have submitted that this increased activity at the wholesale level may be a result of this study. While the scrutiny brought about by this study may have had some effect in stimulating wholesale activity, we have also considered whether sustainable wholesale competition has emerged as a result of 2degrees completing its national network and becoming more active in pursuing wholesale opportunities and encouraging MVNOs on its network.

Consumer engagement

- 3.109 The level of engagement by consumers is an important source of competitive pressure on suppliers of mobile services. An important part of this study has been to better understand the nature and effectiveness of consumer engagement in the mobile market, and whether consumers face any issues in comparing and switching between retail mobile offers.
- 3.110 Although submissions have not revealed significant issues for consumer engagement in the mobile market, we remain of the view that it is important to better understand the extent to which mobile consumers are engaged and active, and what is important to consumers when choosing a mobile service provider.
- 3.111 The ability of different consumers to review their needs and to periodically compare and switch between retail mobile offers will affect expansion conditions within the mobile market and the incentives for mobile providers to compete. The ability of a mobile service provider to enter and expand in market segments will affect its competitive position. This is because the number and the mix of customers are likely to influence a mobile provider's costs, profitability, and its ability to continue to invest in its network.

Chapter 4 Key issues we identified

Purpose and structure of this chapter

- 4.1 During this study, we identified three key issues which may influence the performance of the mobile market in delivering competitive outcomes for mobile consumers in New Zealand:
 - 4.1.1 spectrum;
 - 4.1.2 MVNO access; and
 - 4.1.3 mobile consumer engagement.
- 4.2 This chapter sets out our more detailed exploration of these three key issues, discussing them and presenting our findings and actions.

Spectrum

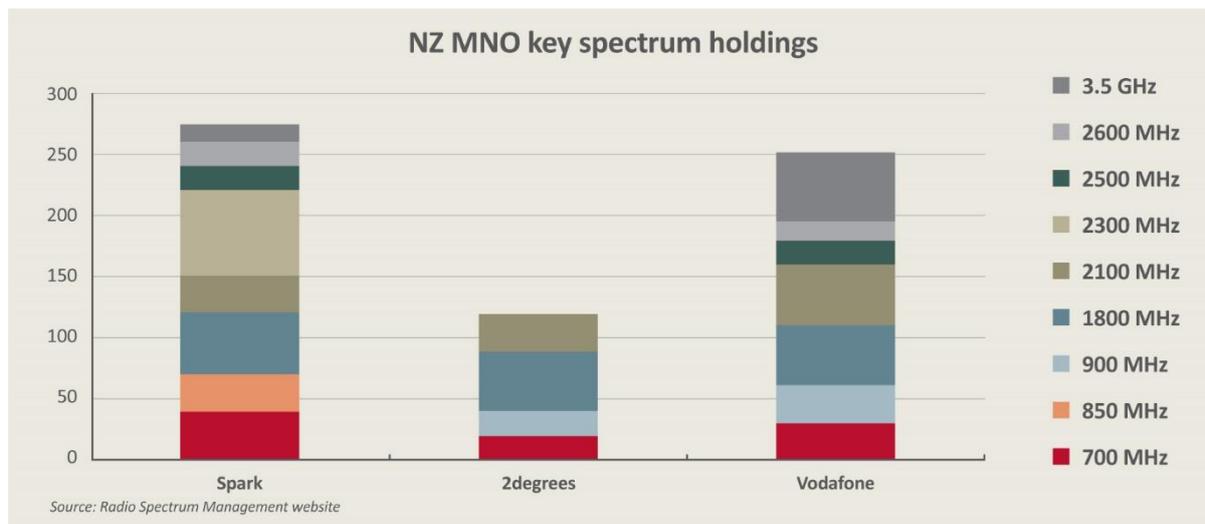
Introduction

- 4.3 This section sets out our analysis and findings on radio spectrum allocation including:
 - 4.3.1 the importance of spectrum for competition between existing MNOs;
 - 4.3.2 the importance of spectrum for new entry;
 - 4.3.3 other obligations and payment terms for spectrum allocation; and
 - 4.3.4 a summary of our views on spectrum.

Spectrum and competition between existing MNOs

- 4.4 Radio spectrum is a critical input used in the deployment of a mobile network. The type and amount of spectrum that is allocated to MNOs will affect the way in which they deploy their networks and the services that can be offered in downstream markets, including wholesale and retail markets. The existing spectrum holdings of the three MNOs are summarised in Figure 12.

Figure 12 Spectrum holdings



4.5 The asymmetries in existing spectrum holdings between the MNOs varies across spectrum bands. For example:

- 4.5.1 in the sub 1 GHz bands, Spark holds a total of 70 MHz spectrum (700 MHz/850 MHz), Vodafone holds a total of 60 MHz spectrum (700 MHz/900 MHz), and 2degrees holds a total of 40 MHz spectrum (700 MHz/900 MHz);
- 4.5.2 in the 1800 MHz band, each of the MNOs currently hold 50 MHz spectrum;
- 4.5.3 in the 2100 MHz band, Spark and 2degrees each hold 30 MHz, while Vodafone holds 50 MHz; and
- 4.5.4 in the 3.5 GHz band, Vodafone currently holds 56 MHz (which it will use for its 5G services from December 2019), and Spark holds 14 MHz

4.6 As discussed below:

- 4.6.1 the existing management rights in the 1800 MHz and 2100 MHz bands are due to expire in 2021. The Government has recently announced its decisions on the proposed renewal of management rights within these bands; and

- 4.6.2 the existing management rights in the 3.5 GHz band are due to expire in 2022.¹¹⁴ The management rights for the use of spectrum in this band beyond 2022 are due to be allocated in 2020.
- 4.7 The spectrum held by Spark and to a lesser extent Vodafone in some of the higher frequency bands (particularly the 2300-2600 MHz bands) has enabled them to launch fixed wireless broadband services while minimising disruption to their mobile customers. For example, the number of subscribers to Spark’s fixed wireless broadband service increased from 84,000 subscribers as of June 2017, to 140,000 subscribers as of June 2019.¹¹⁵
- 4.8 The ability to offer fixed wireless services may have been a factor in Trustpower’s decision to sign an MVNO agreement with Spark. Many of Trustpower’s rural customers are unlikely to have access to fibre services in the near future, and these customers can be served using fixed wireless services.¹¹⁶
- 4.9 In March 2019, the Government announced its decision on the renewal of radio spectrum management rights in the 1800 MHz and 2100 MHz bands. These rights are due to expire in 2021. As a result:¹¹⁷
- 4.9.1 in the 1800 MHz band, of the 50 MHz currently held by each of 2degrees, Spark and Vodafone, 40 MHz is proposed to be renewed; and
- 4.9.2 in the 2100 MHz band, all of the existing rights held by 2degrees (30 MHz), Spark (30 MHz), and Vodafone (50 MHz) are proposed to be renewed.¹¹⁸
- 4.10 A number of submitters agreed that significant disparities in spectrum holdings are likely to distort competition at both the retail and the wholesale level. For example, Sky said that effective spectrum allocation “lies at the heart of a competitive mobile market”.¹¹⁹ Trustpower and Spark agreed that spectrum is a critical input, and that significant asymmetries in holdings can affect competition.¹²⁰ Vocus said it

¹¹⁴ The current holdings of 3.5 GHz spectrum shown in Figure 12 are in the lower part of the 3.5 GHz band.

RSM are currently inviting expressions of interest for a proposed short-term allocation of spectrum in the upper portion of the 3.5 GHz band to support the deployment of 5G services between 2020-2022.

¹¹⁵ Spark New Zealand FY19 Results Summary, p 35.

¹¹⁶ Trustpower media release, “Trustpower pleased to announce wireless broadband and mobile services on the way for customers”, (20 November 2018).

¹¹⁷ Government media release, “Spectrum rights renewed in 3G and 4G bands”, (12 March 2019), available at <https://www.beehive.govt.nz/release/spectrum-rights-renewed-3g-and-4g-bands>.

¹¹⁸ An additional 10 MHz in the 2100 MHz band held by Telstra is not to be renewed.

¹¹⁹ Sky submission on the Preliminary Findings paper, (28 June 2019), para 2.1.

¹²⁰ Trustpower submission on the Preliminary Findings paper, (28 June 2019), p 3; Spark submission on the Preliminary Findings paper, (28 June 2019), p 1.

supported a rebalancing of spectrum to bolster the ability of 2degrees to compete at both the retail and wholesale levels.¹²¹

- 4.11 Vodafone also agreed that spectrum is a key input that will continue to have a very important influence on competitive conditions in downstream markets.¹²² According to Vodafone, compared to other countries, New Zealand has a significant amount of spectrum allocated to the MNOs, which has lowered the costs of network deployment and reduced the impact of other challenges (such as covering complex terrain and a small population).¹²³
- 4.12 Vodafone submitted that existing spectrum holdings have been driven by competition, allocation rules set by the Government, and commercial decisions by operators (citing the example of the 700 MHz spectrum allocation process, in which 2degrees did not seek to acquire the full block that was available to it). According to Vodafone, the resulting spectrum holdings reflect the market shares of each MNO, with 2degrees holding more spectrum on a per subscriber basis than Vodafone and Spark.¹²⁴
- 4.13 2degrees holds a smaller block of sub-1 GHz spectrum, and although its parent has stated that it has been able to compete with the other MNOs,¹²⁵ 2degrees has submitted that its ability to continue to compete and expand depends on acquiring new spectrum.¹²⁶ According to 2degrees' submission, existing disparities in spectrum should not be widened, and in particular:¹²⁷
- 4.13.1 2degrees should be able to acquire at least the same amount of 3.5 GHz spectrum as the other MNOs. Each MNO should be able to acquire a minimum of 80 MHz,¹²⁸ although 100 MHz would be ideal, allowing optimal long-term competitive delivery of wireless services; and
- 4.13.2 2degrees should be able to acquire the unused 2100 MHz held by Telstra.
- 4.14 In responding to Vodafone on spectrum holdings, 2degrees submitted that Vodafone's position would lock the market into a 'current state', with 2degrees'

¹²¹ Vocus submission on the Preliminary Findings paper, (28 June 2019), para 38.

¹²² Vodafone submission on the Preliminary Findings paper, (28 June 2019), p 9.

¹²³ Vodafone submission on the Preliminary Findings paper, (28 June 2019), p 3, 10.

¹²⁴ Vodafone submission on the Preliminary Findings paper, (28 June 2019), p 13.

¹²⁵ Trilogy International Partners, "Annual Information Form for the Year Ended December 31, 2017", (21 March 2018), p 16.

¹²⁶ 2degrees submission on the Preliminary Findings paper, (June 2019), p 6.

¹²⁷ 2degrees submission on the Preliminary Findings paper, (June 2019), p 9-10.

¹²⁸ 2degrees submission on the Issues Paper (October 2018), p 23.

market share being frozen by lower spectrum holdings. 2degrees submitted that this would not support ongoing competition at the retail or wholesale level.¹²⁹ 2degrees also noted that at the time of the 700 MHz spectrum auction in 2014, 2degrees was capital constrained. At the time, 2degrees was yet to record a profit, and was still deploying its national network and making substantial payments for national roaming.

- 4.15 In allocating spectrum, it is important that consideration is given to the likely competitive effects of any allocation. While we recognise that there may be competing objectives that the Crown will likely need to balance, we consider that promotion of competition should be an important consideration in spectrum allocation for the long-term benefit of New Zealanders.
- 4.16 The competition impacts of spectrum acquisitions can be considered in two ways:
- 4.16.1 under the Commerce Act through the merger clearance process and the ability for the Commission to undertake merger enforcement investigations under section 47 of the Commerce Act; and
 - 4.16.2 through tools applied as a matter of Government policy as part of auction design to promote competition, including setting the reserve price for spectrum allocations, spectrum caps (or acquisition limits), ‘use it or lose it’ provisions, implementation requirements, and payment terms.¹³⁰
- 4.17 In considering whether an acquisition (including renewals) of spectrum would be likely to substantially lessen competition under section 47 of the Commerce Act, we look at the impact of the acquisition on telecommunications markets. This is a relative test that examines competition with and without the acquisition to see whether competition would likely be substantially lessened as a result of the acquisition. The competitive impact may not only depend on the particular band of spectrum being acquired, but also on holdings in other spectrum bands which may be a close substitute.
- 4.18 The use of mechanisms such as spectrum caps as part of an auction for new spectrum allocations may seek to further promote competitive conditions. RSM has been consulting on the key issues surrounding the allocation of further spectrum (initially in the 3.5 GHz band) to support the deployment of 5G services, including the use of spectrum caps.¹³¹ The MNOs have submitted, both to RSM and

¹²⁹ 2degrees cross-submission on Preliminary Findings paper, (July 2019), p 3-4.

¹³⁰ These tools are discussed in the recent Cabinet Paper on 5G spectrum. See Cabinet Paper, “Allocation of Radio Spectrum for 5G Mobile”, (27 February 2019), para 49, 56, 76 and 78.

¹³¹ RSM, “Preparing for 5G in New Zealand: Discussion document”, (March 2018); “Discussion document: Technical Arrangements of the 3.5 GHz Band”, (June 2019).

throughout this study, that they should each be able to acquire 80-100 MHz of 3.5 GHz spectrum.

- 4.19 We consider that a key feature of the allocation process for this spectrum will be the setting of acquisition limits that prevent any party or parties from dominating spectrum holdings and distorting competition in downstream markets. The Minister of Broadcasting, Communications and Digital Media (the Minister) has recommended to the Cabinet Economic Development Committee that a limit be set on the amount of national 5G spectrum given to any one operator, “to prevent stronger players in the market from shutting out weaker incumbents or potential new entrants”.¹³²
- 4.20 In its advice to the Australian Minister for Communications on spectrum limits in relation to 3.6 GHz spectrum, the ACCC noted it may be appropriate to take into account existing holdings of spectrum in other bands when considering how much new spectrum a party should be able to acquire.¹³³
- 4.21 In commenting on spectrum caps to be applied in the upcoming 3.5 GHz auction, Spark said it would be concerned if an aggregate spectrum cap were to be applied.¹³⁴ Spark submitted that any conclusions on spectrum asymmetries should consider utilisation of existing holdings, and Spark’s core spectrum holdings are heavily utilised. As a result, Spark will need to invest in either additional spectrum or more sites. According to Spark, the latter is becoming more challenging due to community concerns, and so if Spark cannot acquire the spectrum it needs, the result will be capacity constraints, with implications for consumers and competition.¹³⁵
- 4.22 We note Spark’s submission on the importance for Spark of acquiring enough spectrum, otherwise network capacity will be compromised as it reaches spectrum saturation, and as it faces challenges building more sites. While this may be the case, it is likely to equally apply to the other MNOs, and, in particular, 2degrees due to its existing spectrum holdings. If existing asymmetries are widened significantly, such constraints are likely to be exacerbated. For example, we have already seen that 2degrees has not yet launched fixed wireless services, and this may be due to its lack of higher capacity spectrum.

¹³² Cabinet Paper, “Allocation of Radio Spectrum for 5G Mobile”, (12 December 2018 - released 27 February 2019), para 5, 27, 49.

¹³³ ACCC, “Allocation limits advice for the 3.6 GHz spectrum allocation”, (July 2018), p 2.

¹³⁴ Spark submission on the Preliminary Findings paper, (28 June 2019), para 26.

¹³⁵ Spark submission on the Preliminary Findings paper, (28 June 2019), para 30-31.

- 4.23 Spark also submitted that spectrum bands have different characteristics (such as coverage vs capacity), and that not all bands are strong substitutes.¹³⁶ At present, only the 3.5 GHz band has widespread equipment availability and large bandwidths available to support 5G services. According to Spark, existing holdings can have little practical relevance when considering 3.5 GHz spectrum acquisitions.¹³⁷
- 4.24 However, Spark has previously stated that different spectrum bands are readily substitutable. In its application for clearance to acquire 2300 MHz spectrum, Spark made the following statement:¹³⁸
- Spectrum in the 2300MHz and other spectrum bands made available for mobile and broadband services (including the 700MHz, 850MHz, 900MHz, 1800MHz, 2100MHz, 2500/2600MHz and 3400MHz bands) are readily substitutable with each other for the provision of LTE FWA services.
- 4.25 Substitutability between spectrum bands is an important consideration when looking at the implications for competition of a spectrum acquisition. This may be particularly relevant for the allocation of 3.5 GHz spectrum and the renewals of 1800 MHz and 2100 MHz spectrum.

Spectrum and new entry

- 4.26 As discussed above, access to spectrum is important for existing operators to compete in downstream retail and wholesale markets. Access to spectrum is also required for new entrants.
- 4.27 In addition to looking at differences in the current spectrum holdings of the three existing MNOs, we have considered whether parties other than the existing three MNOs should be able to participate in any future allocation of spectrum. This includes potential new MNOs, as well as other parties such as regional service providers.
- 4.28 Based on our analysis of the performance of the retail mobile market in New Zealand, there does not appear to be a strong case for regulatory intervention to promote a fourth MNO to enter the New Zealand market.

¹³⁶ Spark submission on the Preliminary Findings paper, (28 June 2019), para 33.

¹³⁷ Spark submission on the Preliminary Findings paper, (28 June 2019), para 37.

¹³⁸ Spark, "Notice Seeking Clearance of a Business Acquisition Pursuant to Section 66 of the Commerce Act 1986", 18 December 2015, para 8.7.

- 4.29 Several parties agreed that there is not a case for regulatory intervention to support a fourth MNO. For example:
- 4.29.1 2degrees submitted that a fourth national MNO is unlikely to be sustainable in a market with falling margins, in which network build is costly, and in which significant ongoing investment is required. 2degrees noted that new entry is emerging in the form of MVNOs as a result of wholesale competition;¹³⁹
 - 4.29.2 Covec submitted that it would be challenging to build a fourth mobile network in New Zealand and estimated a break-even market share of 10% of revenues would need to be achieved relatively quickly.¹⁴⁰ Covec noted that a fourth MNO would further fragment spectrum holdings.¹⁴¹
 - 4.29.3 TUANZ indicated that a fourth MNO was unlikely due to the capital costs required to build coverage across a geographically challenging and small market.¹⁴²
- 4.30 However, the upcoming 3.5 GHz spectrum allocation should not preclude the possibility of new entry if investors see a potential business case to acquire and use spectrum. In our view, any entry decision should be up to investors, who should be able to determine the merits of a business case for entry. Reserving the new spectrum solely for the use of the existing three MNOs would erect an absolute barrier to entry and would preclude the possibility of new entry into downstream markets.
- 4.31 A number of parties agreed. For example, Spark submitted that the design of spectrum auctions should not prevent possible entry from new operators.¹⁴³
- 4.32 Such entry may not necessarily be in the form of a fourth MNO that would compete against the existing MNOs. For example, in November 2018 Dense Air acquired 70 MHz of spectrum in the 2600 MHz band in New Zealand.¹⁴⁴ Dense Air intends to use the spectrum to offer network extension services to the existing MNOs, by using small-cell technology at the edge of cells to enhance coverage.

¹³⁹ 2degrees submission on the Preliminary Findings paper, (June 2019), p 8.

¹⁴⁰ Covec submission on the Issues paper, (24 October 2018), para 62.

¹⁴¹ Covec submission on the Issues paper, (24 October 2018), p 8, 9.

¹⁴² TUANZ submission on the Preliminary Findings paper, (30 June 2019), para 16.

¹⁴³ Spark submission on the Preliminary Findings paper, (28 June 2019), para 25.

¹⁴⁴ <http://denseair.net/dense-air-acquires-2-6-ghz-spectrum-assets-in-new-zealand/>.

- 4.33 Dense Air’s entry is more complementary to the existing MNOs, as Dense Air does not intend to compete with existing mobile operators at the retail level.¹⁴⁵ The Dense Air business model is targeted at enhancing MNOs coverage and capacity using Dense Air’s licenced spectrum to in-fill coverage gaps in urban areas and extend capacity weak spots in more rural areas where it is not economically efficient for MNOs to deploy this additional infrastructure themselves.
- 4.34 Potential interest in upcoming spectrum allocations in New Zealand has emerged from regional wireless internet service providers (WISPs). InternetNZ highlighted the importance of non-mobile operators such as WISPs being able to compete for spectrum rights.¹⁴⁶ According to InternetNZ, the issues raised by the Wireless Internet Service Providers Association of New Zealand (WISPA NZ) – including the prospect that spectrum currently used by WISPs may be transferred to the MNOs – are particularly relevant.¹⁴⁷
- 4.35 It appears that the WISPs will continue to have access to spectrum in the 3.5 GHz band, although the precise details of WISP allocations are yet to be confirmed. In its March 2018 discussion document on 5G spectrum, RSM referred to a total of 280 MHz of spectrum in the 3.5 GHz band as being available for 5G networks.¹⁴⁸
- 4.36 In February 2019, the Minister of Broadcasting, Communications and Digital Media said that officials have since identified that 390 MHz of spectrum could be allocated in the 3.5 GHz band, which could in principle be sufficient to meet the needs of up to four national network operators, as well as regional service providers (WISPs).¹⁴⁹ The amount of 3.5 GHz spectrum actually available for direct allocation will also depend on Treaty of Waitangi policy, and guard band considerations.¹⁵⁰
- 4.37 The Minister also noted that the allocation of 3.5 GHz spectrum is expected to take place in 2020, with the associated rights to use the spectrum to apply from 2022.¹⁵¹

¹⁴⁵ <http://denseair.net/dense-air-acquires-2-6-ghz-spectrum-assets-in-new-zealand/>.

¹⁴⁶ InternetNZ submission on the Preliminary Findings paper, (28 June 2019), para 13.

¹⁴⁷ InternetNZ submission on the Preliminary Findings paper, (28 June 2019), para 11.

¹⁴⁸ RSM “Preparing for 5G in New Zealand: Discussion document”, (March 2018), p 5.

¹⁴⁹ Cabinet Paper, “Allocation of Radio Spectrum for 5G Mobile”, (12 December 2018 - released 27 February 2019), para 5, 27.

¹⁵⁰ Cabinet Paper, “Allocation of Radio Spectrum for 5G Mobile”, (12 December 2018 - released 27 February 2019), para 27.

¹⁵¹ Cabinet Paper, “Allocation of Radio Spectrum for 5G Mobile”, (12 December 2018 - released 27 February 2019), para 6.

Other obligations and payment terms for spectrum allocation

- 4.38 Several parties have commented on whether obligations should be attached to the allocation of spectrum. Such obligations could include the following:
- 4.38.1 obligations to offer wholesale access to third parties;
 - 4.38.2 obligations to ensure the spectrum is used, rather than hoarded.
- 4.39 Wholesale access obligations have been supported by several parties, including Trustpower,¹⁵² TUANZ,¹⁵³ and Nova.¹⁵⁴
- 4.40 As discussed further in the MVNO section below, we do not see a strong case for regulatory intervention in respect of MVNO access. Our reasons for this – that the downstream retail market in which mobile services are supplied to end users is performing reasonably well, and that competition is also emerging at the wholesale level – apply both to the case for *ex ante* regulation (such as through the addition of an MVNO access service to Schedule 1 of the Telecommunications Act) and the case for including an obligation attached to spectrum rights to offer wholesale access to third parties.
- 4.41 We also note that although Red Dawn Consulting (RDC) flagged a wholesale obligation as a potential option to consider, RDC noted a potential disadvantage is that such an obligation may have an adverse impact on the extent and timing of 5G deployments. This could result in a significant detriment for end users. RDC also noted that it is uncommon for national regulators to attach wholesale obligations to spectrum, with a small number of exceptions (Germany and Romania).
- 4.42 Several submitters have referred to the risk that spectrum might be hoarded rather than used to roll out services. For example, InternetNZ has expressed concerns that spectrum is a scarce resource that is allocated for periods of up to 20 years, which can result in hoarding.¹⁵⁵ 2degrees also submitted that it will be important to have meaningful but realistic implementation conditions to dissuade speculative bidding.¹⁵⁶

¹⁵² Trustpower submission on the Issues paper, (26 October 2018), p 23.

¹⁵³ TUANZ submission on the Preliminary Findings paper, (30 June 2019), para 42.

¹⁵⁴ Nova submission on the Preliminary Findings paper' (28 June 2019), para 8.

¹⁵⁵ InternetNZ submission on the Issues Paper' (26 October 2018), p 9.

¹⁵⁶ 2degrees submission on the Preliminary Findings paper, (June 2019), p 8.

- 4.43 We support the inclusion of ‘use it or lose it’ obligations on parties acquiring spectrum. In this regard, we note that the recommendations of the Minister of Broadcasting, Communications and Digital Media to the Cabinet Economic Development Committee in February 2019 propose to include obligations to use spectrum allocated in the 3.5 GHz band. Such obligations are to ensure that spectrum is actually used, and to discourage hoarding and speculation, which could also have an adverse impact on competition. The requirements proposed by the Minister would require the recipients of the spectrum rights to implement a network within:¹⁵⁷
- 4.43.1 five years in the case of a national network, extendable to seven years on payment of a sum to be decided; and
 - 4.43.2 two years in the case of a regional or local network.
- 4.44 We also note that the February 2019 Cabinet Paper on 5G spectrum refers to the option of allowing recipients of spectrum to pay for the spectrum by instalments, and that the Minister will consider the case for instalments as part of the design of the 3.5 GHz auction.¹⁵⁸ This approach could reduce the barriers for new entrants or allow parties to secure viable spectrum allocations.
- 4.45 We will continue to engage with MBIE on the design of future spectrum auctions including the 5G auction.

¹⁵⁷ Cabinet Paper, “Allocation of Radio Spectrum for 5G Mobile”, (12 December 2018 - released 27 February 2019), para 5, 27 , 56.

¹⁵⁸ Cabinet Paper, “Allocation of Radio Spectrum for 5G Mobile”, (12 December 2018 - released 27 February 2019), para 78.

Findings on spectrum

- F7** Spectrum is a scarce and critical input into the supply of mobile services. Significant asymmetries in spectrum holdings (including in terms of the amount and type of spectrum held) can affect competition in the mobile market. The design of future allocation processes for spectrum should have regard to such asymmetries. In setting limits on the amount of spectrum that may be acquired, it may also be appropriate to have regard to existing holdings in other bands which represent a substitute for the spectrum being auctioned or allocated.
- F8** We do not believe there is a case for regulatory intervention to promote a fourth national MNO to enter the market. However, the design of the upcoming 3.5 GHz spectrum allocation process should not preclude new parties (including parties who may complement or compete with the existing MNOs) from obtaining spectrum.
- F9** We do not believe that there is a strong case for including a condition on spectrum rights that requires wholesale access to be offered to third parties.

MVNOs

Introduction

- 4.46 This section sets out our analysis and findings on MVNOs, including:
- 4.46.1 a brief outline of the potential benefits that MVNOs can bring for consumers of mobile services;
 - 4.46.2 describing the types of MVNO operating models and the gross margins expected for each type of MVNO model;
 - 4.46.3 examining the emergence of competition at the wholesale level for MVNO services in New Zealand; and
 - 4.46.4 summarising our findings with respect to MVNOs.

Potential benefits to consumers from MVNOs

- 4.47 MVNO entry can provide consumers with more choice of standalone mobile services as well as bundles that include mobile and other services. MVNOs can offer price competition and some service innovation, product differentiation, and a more flexible set of tariff arrangements which may better meet the needs of specific customer niches. MVNOs often enter to target niche segments of the market that traditional MNOs may not be willing or able to serve.
- 4.48 There are also benefits to consumers from being able to purchase bundled services. Fixed-line service providers can use an MVNO model to provide bundled offers. For example:
- 4.48.1 Vocus has been offering discounts to residential customers who purchase both a fixed-line broadband service, and a mobile service. For example, its Slingshot brand offers a monthly discount as well as upfront credits (currently \$300) when a customer signs up to any broadband and mobile plan for 12 months;¹⁵⁹
 - 4.48.2 Trustpower, when it launches, intends offering its fixed broadband and electricity customers the option of acquiring mobile services in its bundles.¹⁶⁰ Nova has also recently acquired an MVNO (MegaTEL), enabling

¹⁵⁹ Slingshot website accessed September 2019.

¹⁶⁰ Trustpower media release, "Trustpower pleased to announce wireless broadband and mobile services on the way for customers", (20 November 2018).

it to offer mobile services along with its energy and fixed-line services;¹⁶¹
and

4.48.3 WISPA NZ have indicated that there would be strategic value for WISPs in being able to offer a full-service bundle, including mobile, to rural consumers.¹⁶²

- 4.49 In submissions on the Preliminary Findings, there were a range of views on the importance of MVNO-based competition. Trustpower submitted that MVNO competition is important, and that the Commission may have taken a narrow view of the role that MVNOs can play in promoting competition. According to Trustpower, while some MVNOs may complement MNOs in serving customer niches, broader MVNO models have been successful in other countries in delivering cheaper prices, increased product variety, and consumer choice. Trustpower said that there is no reason why this cannot happen in New Zealand, as long as MVNO access arrangements don't limit the ability of MVNOs to compete and innovate.¹⁶³
- 4.50 Nova said that the ability of non-MNO retailers to gain wholesale access to mobile services on reasonable terms is crucial to ensuring sufficient competition and choice in both fixed and mobile markets.¹⁶⁴ TUANZ submitted that as a fourth MNO is unlikely to be sustainable, increased competition will have to come from MVNOs.¹⁶⁵
- 4.51 2degrees expects new MVNOs to offer additional choice to consumers, although submitted that the small size of the New Zealand market limits the scope for MVNO expansion compared to other countries. 2degrees also noted that there is already strong price competition between MNOs, and that MVNOs may face challenges in gaining the scale required to justify investment in fuller MVNO models.¹⁶⁶
- 4.52 Vodafone and Spark questioned whether greater MVNO participation in the retail market would actually improve consumer outcomes. According to Vodafone, consumers in New Zealand are currently getting a good deal on mobile services, and there is no evidence that MVNOs would add anything.¹⁶⁷ Spark referred to NERA's finding that there is no evidence of a link between MVNO market share and

¹⁶¹ Nova submission on the Preliminary Findings paper, (28 June 2019), para 3.

¹⁶² WISPA NZ submission on the Issues paper, (26 October 2018), p 2.

¹⁶³ Trustpower submission on the Preliminary Findings paper, (28 June 2019), p 4-5.

¹⁶⁴ Nova submission on the Preliminary Findings paper, (28 June 2019), para 6.

¹⁶⁵ TUANZ submission on the Preliminary Findings paper, (30 June 2019), para 26.

¹⁶⁶ 2degrees submission on the Preliminary Findings paper, (June 2019), p 3, 10.

¹⁶⁷ Vodafone submission on the Preliminary Findings paper, (28 June 2019), p 16.

improved consumer outcomes (such as download speeds, data usage, or 4G uptake).¹⁶⁸

- 4.53 In considering the benefits that MVNO-based entry brings for consumers, the performance of the retail market in which mobile services are delivered to consumers is relevant. If the retail market was found to be delivering poor outcomes to consumers, the benefits from promoting additional entry or expansion in the retail market, including through MVNOs, are likely to be greater.
- 4.54 In Chapter 3, we examined the development of mobile services and competition in New Zealand, based on a range of key indicators. These include indicators relating to the structure of the mobile market (including market shares and entry conditions), as well as performance indicators such as pricing, investment, and service quality. We found that the retail market continues to develop and deliver increasingly competitive outcomes for mobile consumers.
- 4.55 Trustpower noted that in other countries with a similar population to New Zealand, such as Denmark, Austria, Norway, and Ireland, there are a larger number of MVNOs.¹⁶⁹ However, while other countries have a larger number of MVNOs, we are ultimately interested in the long-term benefit of end users of telecommunications services, including mobile services, in New Zealand. In this regard, we have looked at the performance of the retail market for mobile services in terms of delivering competitive outcomes for consumers.
- 4.56 There appears to be mixed evidence of the benefits brought by MVNOs. This likely depends on the extent of competition between MNOs and the terms and conditions under which MVNOs operate in different jurisdictions.
- 4.57 We remain of the view that MVNO-based entry can bring a range of potential competitive benefits, including offering greater choice, service innovation (including bundles of mobile services and other services), and more competitive pricing. As noted earlier, MVNOs often target niche segments of the market that traditional MNOs may not be willing or able to serve.
- 4.58 However, MVNOs are dependent on their host network, and this may limit the extent to which they can differentiate their offerings from those of their host MNO, depending on the terms and conditions of access.¹⁷⁰

¹⁶⁸ Spark submission on the Preliminary Findings paper, (28 June 2019), para 51d.

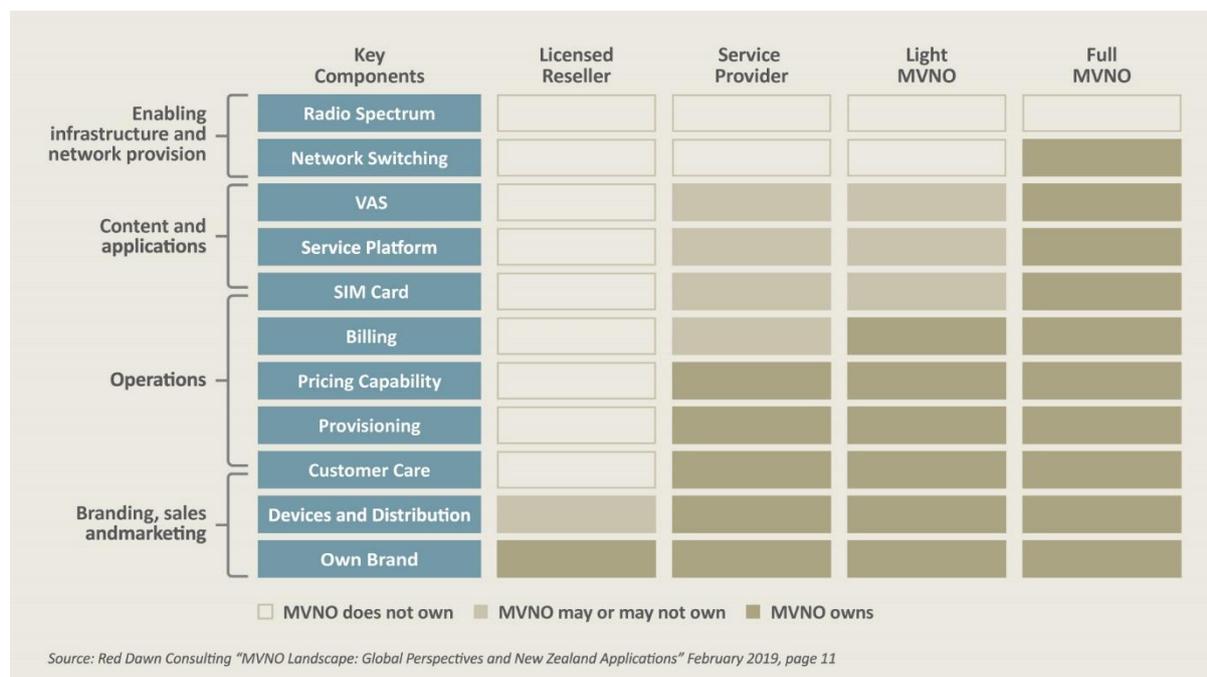
¹⁶⁹ Trustpower cross-submission on Preliminary Findings paper, (19 July 2019), p 4.

¹⁷⁰ The ACCC has also stated that it considers MVNOs to provide a limited constraint on the MNOs in Australia, “particularly as they rely on purchasing wholesale end-to-end mobile services from MNOs.”

MVNO operating models and margins

- 4.59 MVNOs typically provide the same or similar retail services as a traditional MNO. They purchase capacity from an MNO, then in turn offer services to their own customer base and acquire new customers from MNOs or other MVNOs.
- 4.60 There are different types of MVNO operating models. These are typically described as ranging from a licensed reseller, which is the minimalist form of MVNO, through intermediate models, to a ‘full’ MVNO (sometimes also referred to as ‘thick’ MVNOs). Under a full MVNO model, the MVNO invests in more of the key components of a mobile network apart from radio spectrum. The MVNO models offer the MNO the opportunity to generate revenue from spare network capacity.
- 4.61 Figure 13 illustrates the different MVNO operating models.

Figure 13 MVNO operating models



- 4.62 The number of key components carried out by the MVNO grows for each progressive model, as does the expected margin discount typically offered by the MNO.¹⁷¹ This is because the level of investment required by the MVNO increases as it moves from a simple reseller with minimal investment through to a ‘full’ MVNO, where the MVNO owns and operates core network elements. As a result, the

ACCC, “Statement of Issues TPG Telecom – proposed merger with Vodafone”, (13 December 2018), para 121 and 190.

¹⁷¹ The discounts expected under each of the MVNO operating models are further discussed below.

division of components between the MVNO and the host MNO will vary across the operating models, and the level of discount will reflect this division.

4.63 Table 7 below shows the typical range of gross margins (representing discounts off retail prices) expected for each of the MVNO models illustrated in Figure 13. These ranges are taken from the experience of RDC and its involvement in approximately one hundred MVNO arrangements globally.¹⁷²

Table 7 MVNO operating models and gross margin

MVNO Model	Gross Margin Range
Licensed Reseller	10-20%
Service Provider	20-35%
Light MVNO	35-55%
Full MVNO	45-70%

Source: RDC “MVNO Landscape: Global perspectives and New Zealand Applications” April 2019.

4.64 We note that the European Commission cleared a 4-to-3 merger in Austria on the condition that the merged entity meet a number of conditions to facilitate new entry, including providing wholesale access to MVNOs. The pricing terms of that wholesale access included a discount of 25% off the retail price (retail-minus discount).¹⁷³

4.65 We understand that the model operated by the Warehouse Mobile would sit towards the left-hand side of Figure 13 (Licensed reseller). Vocus and Trustpower appear to sit somewhere between Service Provider and Light MVNOs.¹⁷⁴

4.66 As RDC has noted, the potential growth of MVNO models may be moderated by the relatively small size of the New Zealand market and the set-up costs associated with MVNO operating models. According to RDC:

4.66.1 for an MVNO based on a licensed reseller model, set-up costs for the MVNO are low;

4.66.2 for a light MVNO, set-up costs incurred by the MVNO can be between \$1 million and \$2 million; and

¹⁷² RDC, “MVNO landscape: Global perspectives and New Zealand Applications”, (24 April 2019), p 12-13.

¹⁷³ European Commission Decision, Case No M.6497 – Hutchison 3G Austria / Orange Austria, (12 December 2012), p 165.

¹⁷⁴ Informed by RDC, “MVNO Landscape report” (24 April 2019), p 30.

4.66.3 for a full MVNO, set-up costs incurred by the MVNO can be between \$2 million and \$3 million.

4.67 RDC suggest that the full MVNO model is unlikely to be justified for a market the size of New Zealand.¹⁷⁵

4.68 Spark and Vodafone agreed with RDC's view that given the small size of the New Zealand market, there may be limited opportunities for MVNOs, and that such opportunities are likely to be at the reseller end of the spectrum shown in Figure 13 above.¹⁷⁶

4.69 We note RDC's view that the light MVNO model is likely to be appropriate for New Zealand:¹⁷⁷

In NZ, we suggest that the Light MVNO model is the most appropriate. The licenced reseller and service provider models are unlikely to provide sufficient margins, nor the ability to facilitate service differentiation for potential new entrants.

4.70 Trustpower and Vocus submitted that it is important for MVNOs to have the opportunity to negotiate access for thicker MVNO models, to give them greater control and deeper access to the mobile networks.¹⁷⁸ Trustpower noted that service providers with scale, particularly in fixed-line markets, are likely to be interested in thick MVNO arrangements.

4.71 We discuss the emergence of wholesale competition between the MNOs in the following section, where we note that a number of MNOs have expressed a willingness to continue to develop commercial arrangements to provide MVNOs with greater flexibility for differentiation and innovation. However, as noted by RDC, thicker MVNO models will involve greater investment by the MVNO partner.

Emerging competition at the wholesale level

4.72 Until recently, competition between the MNOs to supply wholesale mobile services to MVNOs appears to have been limited. The MVNOs that emerged in New Zealand prior to 2015 were hosted by either Vodafone or Spark, and market evidence indicates that commercial arrangements may have been a factor in limiting the ability of the MVNOs to expand in the retail market. As noted in Chapter 3, the

¹⁷⁵ RDC, "MVNO landscape: Global perspectives and New Zealand Applications", (24 April 2019), p 14.

¹⁷⁶ Spark submission on the Preliminary Findings paper, (28 June 2019), para 46; Vodafone submission on the Preliminary Findings paper, (28 June 2019), p 17.

¹⁷⁷ RDC, "MVNO landscape: Global perspectives and New Zealand Applications", (24 April 2019), p 14.

¹⁷⁸ Trustpower submission on the Preliminary Findings paper, (28 June 2019), p 5-6; Vocus cross-submission on Preliminary Findings paper, (19 July 2019), para 22 and 25.

share of the retail mobile market supplied by MVNOs is around 1%, which is considerably lower than in comparable countries.¹⁷⁹

- 4.73 Evidence collected during the study indicates that, until recently MNOs have shown little interest in hosting MVNOs, with MVNO negotiations often being difficult and protracted.
- 4.74 Trustpower has previously submitted that competitive tension at the wholesale level in New Zealand is likely to be low, due to the third MNO being a relatively late entrant with more limited coverage than the other MNOs.¹⁸⁰ 2degrees has also submitted that it had previously been limited in its ability to offer competitive MVNO services.¹⁸¹

When pricing MVNOs, 2degrees offers a national service, including coverage in areas where it purchases national roaming services. In the past, the blended rates it offers on voice, SMS and data would have been higher due to the costs and risks associated with national roaming, but these have improved over the last two years as the reliance on national roaming has reduced. Now, in 2018, national roaming accounts for a very small amount of network traffic.

- 4.75 2degrees also argued that in the past, two MNOs with broadly similar market shares had little incentive to support MVNOs, “but the presence of a growth-oriented third network will change behaviour”.¹⁸² 2degrees pointed to similar trends in overseas markets, where a third MNO pursues growth using MVNOs, prompting a competitive response from incumbents.
- 4.76 There is some evidence to suggest that competitive conditions at the wholesale level have recently been improving, along the lines suggested by 2degrees.
- 4.76.1 The Warehouse Mobile launched mobile services in late 2015, based on 2degrees’ network.
- 4.76.2 Spark submitted that it has improved the commercial terms it has been offering for MVNO services.¹⁸³

¹⁷⁹ For example, in its final report on its Communications Sector Market Study, the ACCC reported the market share of MVNOs as being greater than 10%. See ACCC, “Communications Sector Market Study”, (April 2018), Figure 4.2.

¹⁸⁰ Trustpower, “Promoting a vibrant mobile market in New Zealand”, (3 November 2015), p 12.

¹⁸¹ 2degrees submission on the Issues paper, (26 October 2018), p 17.

¹⁸² 2degrees submission on the Issues paper, (26 October 2018), p 18.

¹⁸³ Spark submission on the Issues paper, (26 October 2018), para 113.

- 4.76.3 Trustpower received competing MVNO offers from 2degrees and Spark in 2018¹⁸⁴ In November 2018, Trustpower announced it had signed an MVNO agreement with Spark, enabling Trustpower to start offering mobile and wireless broadband services. Trustpower said it had nearly 400,000 customers in total across all its services, including 91,000 fixed-line telecommunications customers.¹⁸⁵
- 4.76.4 Kogan Mobile, who supply mobile services in Australia, has recently launched mobile services in New Zealand, based on its wholesale agreement with Vodafone.¹⁸⁶
- 4.76.5 MyRepublic has also announced that it intends to enter as an MVNO in Australia and New Zealand, following its entry into the Singapore market.¹⁸⁷
- 4.77 Although it did not secure Trustpower’s MVNO business, 2degrees is likely to continue to compete for MVNO opportunities as:
- 4.77.1 it has invested in a Mobile Virtual Network Enabler (MVNE) platform that supports independent and differentiated MVNO models;
- 4.77.2 it can now offer comparable levels of coverage as the other MNOs; and
- 4.77.3 having incurred the fixed costs of building its network, it can improve scale and reduce unit costs through increased wholesale activities.
- 4.78 Several parties have questioned whether competitive conditions at the wholesale level have improved in recent years. For example, Trustpower submitted that while its preference is for commercial arrangements, it is not confident that wholesale competition has developed to provide sufficient incentives for MNOs to negotiate. Trustpower submitted that the recent interest shown by MNOs in hosting MVNOs is likely to be a result of this study.¹⁸⁸
- 4.79 Nova acknowledged that 2degrees is likely to compete for MVNO opportunities, given its investment in an MVNE platform, although Nova has not yet seen any

¹⁸⁴ 2degrees submission on the issues paper, (26 October 2018), p 16.

¹⁸⁵ Based on its 30 September 2018 results. Also https://www.nzherald.co.nz/business/news/article.cfm?c_id=3&objectid=12163254, 20 November 2018.

¹⁸⁶ See <https://www.koganmobile.co.nz/>.

¹⁸⁷ Communications Day, “MyRepublic plans ANZ MVNO launch within a year”, (26 June 2018), and Commerce Commission correspondence with Kogan Mobile and MyRepublic.

¹⁸⁸ Trustpower submission on the Preliminary Findings paper, (28 June 2019), p 7.

actual evidence that 2degrees has prompted a competitive response from Spark or Vodafone.¹⁸⁹ Sky questioned why the wholesale market for mobile services in New Zealand has not yet developed as in other countries,¹⁹⁰ while InternetNZ also submitted that New Zealand's low MVNO share is out of step with other OECD countries.¹⁹¹

- 4.80 According to Vocus, any finding that 2degrees has increased competition at the wholesale level is optimistic and speculative.¹⁹² Vocus submitted that it is prepared to be proven wrong, and it intends to issue a request for proposal (RFP) which will give all three MNOs an equal opportunity to bid for its MVNO business.¹⁹³
- 4.81 2degrees has noted that it continues to be in discussion with several potential MVNOs.¹⁹⁴ 2degrees said that it will continue to pursue MVNO wholesale agreements as it has invested in its own MVNE platform and has an incentive to recover the cost of that investment.¹⁹⁵
- 4.82 2degrees also disputed other submissions that competition for MVNOs is only emerging as a result of this study. 2degrees submitted that it had invested in its MVNE platform prior to the commencement of this study,¹⁹⁶ and that it continues to be interested in engaging in genuine commercial discussions with existing and potential MVNOs.
- 4.83 For MNOs, wholesale agreements must be commercially viable. In providing wholesale MVNO access, the MNO will risk cannibalising some of its retail market share to the MVNO, particularly if the MNO has established sub-brands which may be vulnerable to the MVNO.
- 4.84 The MNO will need to balance this risk of cannibalisation against the risk that the MVNO will secure a wholesale agreement with a rival MNO, enabling it to compete at the retail level in which case the MNO would then still risk losing those customers. This risk has increased with the presence of three established mobile networks.
- 4.85 For an MVNO, the commercial terms of a wholesale agreement, and in particular the gross margin or discount off retail prices that the MVNO receives, should reflect

¹⁸⁹ Nova submission on the Preliminary Findings paper, (28 June 2019), para 7(b).

¹⁹⁰ Sky submission on the Preliminary Findings paper, (28 June 2019), para 20.

¹⁹¹ InternetNZ submission on the Preliminary Findings paper, (28 June 2019), para 16.

¹⁹² Vocus submission on the Preliminary Findings paper, (28 June 2019), para 13.

¹⁹³ Vocus submission on the Preliminary Findings paper, (28 June 2019), para 17.

¹⁹⁴ 2degrees submission on the Issues paper, (26 October 2018), p 2.

¹⁹⁵ 2degrees submission on the Issues paper, (26 October 2018), p 17, 18.

¹⁹⁶ 2degrees cross-submission on the Preliminary Findings paper, (July 2019), p 8.

the functions carried out by the MVNO. As shown in Table 7, the typical gross margins will vary, depending on the type of MVNO operating model.

- 4.86 We appreciate that throughout this study, a range of views have been submitted to us on the state of the wholesale market for mobile services in New Zealand. A number of parties have referred to New Zealand's low MVNO market share, and the difficulties of negotiating wholesale access, as evidence of a lack of competition or market failure. However, in our view, market failure would need to be demonstrated not solely on the basis of a single, narrow indicator such as MVNO market share, but in terms of the broader market in which mobile services are supplied to consumers. Ultimately, our concern is the long-term benefit of end users. As discussed in Chapter 3, the performance of the mobile market has generally improved in terms of delivering competitive outcomes to consumers through lower prices, increasing quality, and a greater choice of services.
- 4.87 As noted above, competitive conditions at the wholesale level have also been improving, in particular as a result of 2degrees completing its own national network and reducing its reliance on Vodafone. 2degrees noted that MVNOs represent an important source of revenue and an opportunity to grow market share, increase utilisation of its network, and gain economies of scale. This provides 2degrees with an incentive to continue to pursue wholesale opportunities. We have seen evidence of this, with 2degrees investing in the development of wholesale arrangements through its MVNE platform to support differentiated wholesale services. 2degrees has been seeking wholesale opportunities with existing and potential MVNOs for a number of years prior to this study.¹⁹⁷
- 4.88 During this study, we have reviewed a considerable amount of information on the development of commercial MVNO arrangements in New Zealand. This includes commercial agreements and supporting information. For example, one MVNO commissioned independent advice on what reasonable commercial terms (including retail-minus discounts) would look like. The discounts contained in the commercial agreements that we have reviewed are broadly in line with that advice, and with the ranges provided by RDC as summarised in Table 7.
- 4.89 While recent activity in the market indicates competitive conditions for MVNOs are improving, there are barriers to switching between MNOs that may impact the willingness of MVNOs to change their host network. One barrier is the need for an MVNO to have its customers switch out SIM cards for their service to continue on

¹⁹⁷ 2degrees submission on the Issues paper, (26 October 2018), p 2.

another host network. The introduction and support of eSIMs by MNOs has the potential to reduce this barrier significantly over time.¹⁹⁸

- 4.90 We note that MVNOs in other countries have emerged in a range of circumstances. In some countries, MVNO access has been introduced via conditions on the award of spectrum or as conditions imposed on mergers.¹⁹⁹ In a small number of cases, MVNO access is directly regulated. In countries such as the UK and Australia, there is no MVNO regulation, with MVNOs emerging as a result of commercial negotiations.
- 4.91 We agree with NERA's submission (on behalf of Spark) that access regulation of markets with multiple competing networks is not common, and that to do so would require compelling evidence of a competition problem or market failure.²⁰⁰ NERA also note that a lack of MVNOs may simply indicate there are not many profitable niches for MVNOs to reach that are not already served by MNOs.²⁰¹
- 4.92 Wholesale competition between the MNOs has recently strengthened and is likely to be sustained because the underlying structural conditions now exist to support it. However, as noted earlier in this chapter, this may be influenced by the future allocation of spectrum. In this regard, we note that the increased capacity available on 5G networks may further stimulate wholesale activity.
- 4.93 As a result, there is potential for further MVNO entry and expansion, as long as the terms of MVNO access are competitive and the MVNO is able to add value to the retail market. Competition, supported by spectrum allocation, should deliver this.

¹⁹⁸ We discuss eSIMs further in Chapter 6 below.

¹⁹⁹ See for example, the Hutchison 3G Austria/Orange Austria merger in 2012 (referred to in para 4.64 above). In the US, in its recent decision on the T-Mobile/Sprint merger, the Department of Justice has proposed a requirement to offer MVNO access to a third party (Dish). See Department of Justice, "Proposed Final Judgment", (26 July 2019), p 19.

²⁰⁰ NERA submission on behalf of Spark, "Competitive effects of MVNO's and assessment of regulated MVNO access", (26 October 2018), para 3.

²⁰¹ NERA submission on behalf of Spark, "Competitive effects of MVNO's and assessment of regulated MVNO access", (26 October 2018), at para 5a.

- 4.94 Although we remain of the view that there is no need to intervene to regulate MVNO access at this stage, we intend to monitor the development of MVNOs, including ongoing monitoring of MVNO market shares and the impact that MVNO-based entry has in the retail market. We also intend to undertake periodic reviews of commercial MVNO arrangements. Reviewing commercial contracts will provide us with greater ongoing visibility of the terms being offered to MVNOs,²⁰² and how the commercial terms compare to key price and non-price dimensions of MVNO access. The competition that is developing at the wholesale level for MVNO services would be expected to encompass multiple dimensions of MVNO contract terms, including price and non-price terms. While the range of MVNO operating models vary considerably, some of the key dimensions include the following:
- 4.94.1 pricing and margin protection;
 - 4.94.2 branding and marketing;
 - 4.94.3 devices and SIMs;
 - 4.94.4 migration to other MVNO models;
 - 4.94.5 service equivalence;
 - 4.94.6 operations; and
 - 4.94.7 contract termination.
- 4.95 Several parties submitted that as part of such monitoring, we should establish targets for MVNO market shares, and that these could trigger an investigation into whether to regulate MVNO access.²⁰³ We do not agree with setting such formal targets, as this would hinge any decision to commence a Schedule 3 investigation on a narrow metric which may not adequately reflect any market failure. As noted earlier, we have examined the performance of the downstream retail market by considering a broad range of competition indicators.
- 4.96 We also note submissions from a number of parties that we should publish benchmarks for a wholesale price for MVNO access, and a reference contract, in

²⁰² During 2017, we similarly undertook a review of commercial roaming arrangements. See Commerce Commission, “Summary of findings of investigation of the national roaming agreement between Vodafone and 2Degrees”, (October 2017).

²⁰³ Vocus submission on the Preliminary Findings paper, (28 June 2019), para 28; Nova submission on the Preliminary Findings paper, (28 June 2019), para 10.

order to provide guidance to MVNOs in their negotiations with MNOs.²⁰⁴ In this regard, we refer to the gross discounts summarised in Table 7, which provides an indication of the gross margins expected for the different forms of MVNOs. As discussed earlier, these margins are based on RDC’s experience with MVNOs in other markets, and are broadly consistent with other evidence we have reviewed during this study. We do not agree with suggestions that we publish a reference contract. Rather we think it preferable that contracts are negotiated to best suit parties’ needs in the context of a competitive wholesale market.

- 4.97 The competition that has been emerging at the wholesale level has enabled a number of prospective MVNOs to secure wholesale mobile access agreements with the MNOs. Such wholesale agreements should enable further entry into the retail mobile market, as long as MVNOs are able to offer retail services or bundles of services that are attractive to end users.

Findings on MVNOs

F10 Until recently, wholesale competition between MNOs to host MVNOs has been limited. MVNOs currently serve just over 1% of the retail mobile market, although there is some evidence that increased wholesale activity by 2degrees has prompted a response from Spark and Vodafone in offering MVNO access. New commercial MVNO agreements have been signed during the past 18 months, such as those between Trustpower and Spark, and Kogan Mobile and Vodafone.

F11 With three national mobile networks, sufficient competitive conditions at the wholesale level exist and we expect MVNOs should emerge if they are commercially viable. The commercial viability of an MVNO will in part depend on the terms agreed with the host MNO. Based on the evidence that we have seen and the entry expected (as noted in F10), competition at the wholesale level has improved. However, spectrum allocation decisions will be critical to support this competition.

F12 In light of this, we do not consider MVNO access regulation to be appropriate at this time. There would need to be greater evidence of market failure in respect of outcomes delivered to mobile consumers to justify wholesale access regulation. We intend to monitor the development of MVNOs, including the commercial terms being offered by the MNOs.

²⁰⁴ Vocus submission on the Preliminary Findings paper, (28 June 2019), para 33-37; Nova submission on the Preliminary Findings paper, (28 June 2019), para 10; Chorus submission on the Preliminary Findings paper, (28 June 2019), para 26.

Consumer engagement and experience with mobile services

Introduction

- 4.98 Markets will best deliver benefits to New Zealanders when both the demand (consumer) side of the market and the supply (provider) side of the market are working well. Where active and well-informed consumers switch to those providers who best meet their needs, suppliers are incentivised to innovate and efficiently meet those needs. Active customers who are prepared to switch will also make it easier for new suppliers to enter and expand by lowering customer acquisition costs.
- 4.99 This section sets out our consideration of:
- 4.99.1 how effectively mobile consumers are able to engage in the mobile market, following the three As (Access, Assess, and Act) approach to evaluating the state of consumer engagement within the mobile market;²⁰⁵
 - 4.99.2 whether mobile consumers exhibit behavioural biases which may influence competition between existing suppliers as well as the prospect for potential suppliers to enter the mobile market; and
 - 4.99.3 potential remedies and actions that could be taken to promote consumer engagement in the mobile market.
- 4.100 We then summarise our views on consumer engagement in the mobile market.

How easily can consumers access the information they need?

- 4.101 For consumers to be able to engage effectively in the mobile market and make informed purchasing decisions, they need to have the right information available to them. Consumers need to access information on both the key features of competing offers and their own mobile usage in order to compare these offers and to select which offer will best meet their needs.
- 4.102 Consumers can freely access plan information on mobile provider websites (and comparison websites).²⁰⁶ Consumers can also gain (often incomplete) plan information through advertising and word-of-mouth.

²⁰⁵ Office of Fair Trading, “What does Behavioural Economics mean for Competition Policy?”, (March 2010), p 10-17.

²⁰⁶ As discussed below, the utility of price comparison websites will depend on how the information is presented.

- 4.103 According to Consumer NZ’s survey of mobile consumers, most consumers appear to find it easy to access their mobile usage information, as shown in Figure 14.
- 4.104 The same survey also showed the ways in which consumers access their usage information, with 58% of consumers accessing their usage via a mobile app, 18% via their provider’s website, and 16% via their monthly bill (although we note that this usage information is often limited to a short time period eg, one month). In their submissions throughout this study, the MNOs also noted that consumers can access their usage information on their mobile provider’s app or website.

Figure 14 Ease of accessing mobile usage information



- 4.105 Along with plan information and their usage trends, consumers could benefit from information on mobile performance ie, the quality of the mobile service they are currently receiving or could possibly receive from another provider. While all three MNOs have coverage maps on their websites there is no shared map for consumers that compares coverage between the three MNOs.
- 4.106 In addition, even when there is nominal coverage there may be ‘holes’ in this coverage caused by a range of factors eg, signal degradation caused by buildings and/or topography, or network base stations being at or nearing capacity.²⁰⁷

How easily can consumers assess the information they have?

- 4.107 Even if consumers have access to usage and performance information, they also need to be able to assess their options ie, the plans available in the market and service quality against their mobile service needs. This assessment is complicated in that consumers need to anticipate what their future usage will be.
- 4.108 The presence of complex choices and/or of non-transparent add-on costs may make plan comparisons more difficult. This can lead to consumer confusion, deterring consumers from actively comparing retail plans. Even where consumers do compare plans, they may end up making poor choices.

²⁰⁷ See, for example, the earlier discussion of 3G and 4G availability in the context of quality of mobile service in Chapter 3.

- 4.109 As an example, where prices are advertised on a non-standardised basis, the ability of consumers to correctly identify the cheapest option will be affected. In this regard, we note that Skinny offers bundles of mobile minutes, texts, and mobile data which renew every 28 days. Other mobile providers offer bundles of minutes, texts, and data on a monthly basis. In order to make a valid comparison, consumers would have to adjust the prices and allowances of the Skinny offer to a monthly equivalent. For example, Skinny’s \$77 plan – with unlimited minutes and texts, and ‘unlimited’ data (with speeds throttled once a 40GB threshold is reached) – is equivalent to \$83.42 per month.
- 4.110 We also note that mobile providers typically offer a range of add-on options which allow consumers to purchase additional minutes or data. Where a consumer is not aware of these additional charges, their ability to select the plan best suited to their needs will be diminished.
- 4.111 Such confusion may deter consumers from comparing retail plans. As shown in Figure 15, most consumers do not compare mobile plans frequently.

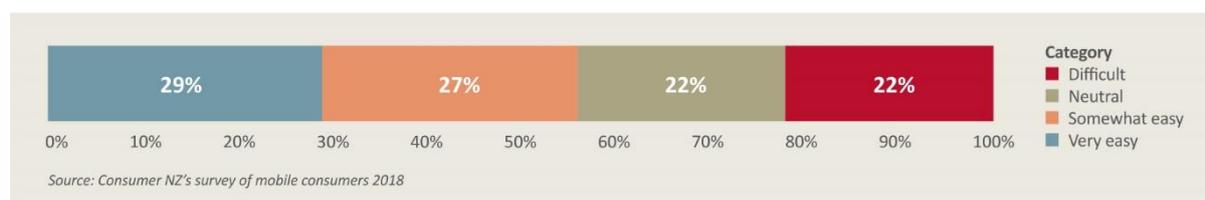
Figure 15 Frequency of comparing plans



- 4.112 2degrees submitted that this was not cause for concern as customers that are happy tend not to invest time and effort into reviewing other plans. 2degrees noted that according to Consumer NZ’s survey of mobile consumers, 70% of consumers are satisfied with their current mobile service provider.²⁰⁸
- 4.113 Nevertheless, consumers may be able to get a better deal if they did compare available options. If many consumers ‘never’ or ‘rarely’ compare plans due to the difficulty of the process, this would be a significant concern. As shown in Figure 16 this does not appear to be the case, as over half of respondents find it easy to compare plans.

²⁰⁸ 2degrees submission on the Preliminary Findings paper (28 June 2019), p 12. We note that Consumer NZ found that 70% of consumers who have not switched within the last 12 months were satisfied with their service.

Figure 16 Ease of comparing providers and plans



- 4.114 It is worth noting that some consumer segments find it relatively more difficult to compare plans. For example, 32% of consumers aged 65 or older in the Consumer NZ survey found it 'difficult' to compare mobile providers and plans.²⁰⁹ It may also be the case that although they generally perceive it to be easy to compare retail plans, consumers may not actually end up on the plan that is best suited to their needs.
- 4.115 The business segment covers a range of customers, with differing abilities and attitudes to reviewing competing mobile plans. Smaller enterprises may face similar search costs and challenges as residential customers when assessing retail offers. Larger corporate customers with higher level of spend on mobile services (often within a whole of business contract) or with more specific requirements are more likely to be better served due to the value of their business. Such customers will often have a procurement team to manage competitive tenders and contracts.
- 4.116 An important issue for consumers being able to make informed purchasing decisions is whether accurate and clear information is available. We have investigated misleading claims from mobile providers in the past. These have included:
- 4.116.1 misleading consumers over 2G network closures;²¹⁰ and
 - 4.116.2 the clarity and visibility of contract terms and charges for SMS/multimedia media services (MMS)/data when consumers send messages or exceed their data bundle allowances.
- 4.117 These are indicative of the issues consumers can face when trying to assess which offers in the market may best meet their needs.

Bundling

- 4.118 While bundles may provide consumers with benefits in the form of discounts and convenience (one bill, one point of contact), the presence of bundles adds another

²⁰⁹ Consumer NZ, Telco Consumer Survey 2018.

²¹⁰ Commerce Commission media release, "Four telcos warned by Commission", (14 Aug 2017).

factor the consumer must consider when comparing plans. This can make it more difficult for consumers to assess different retail offers.

- 4.119 Bundling of services can also increase customer stickiness, for example:
- 4.119.1 Trustpower has reported that churn rates for bundled services (electricity, gas and broadband) are materially lower than for standalone energy services;²¹¹ and
 - 4.119.2 in our 2018 decision on the proposed merger between Sky and Vodafone, we noted evidence indicating that bundling reduces customer churn and increases customer acquisition costs.²¹²
- 4.120 As discussed earlier, uptake of bundles that include mobile services is currently low among residential consumers. Consumer NZ found that 73% of respondents in its 2018 survey do not bundle their mobile service with other services, and Analysys Mason’s Connected Consumer Survey also found that when choosing a mobile plan, the ability to bundle mobile connectivity with other services was ranked relatively low by respondents.²¹³ Of consumers who do bundle their mobile service, most bundle it together with fixed-line broadband and/or streaming services.
- 4.121 The prevalence of business consumers buying mobile services as part of a wider bundle is likely to be higher than residential customers due to the importance of whole of business connectivity. For example, in our 2015 business mobile market study, 78% of businesses said that bundled solutions are important.²¹⁴ As noted in the preceding paragraph, Analysys Mason has found that bundling is ranked relatively low by individual consumers.
- 4.122 Currently in New Zealand there do not appear to be any bundles of mobile services with products for which there are no good alternatives. However, the Commission will continue to monitor the development of bundles.

²¹¹ Trustpower, “Investor Briefing 2018 half Year Results”, (8 November 2018), slide 7.

²¹² Commerce Commission, “Vodafone Europe B.V. and Sky Network Television Limited [2017] NZCC 1 Sky Network Television Limited and Vodafone New Zealand Limited [2017] NZCC 2”, (22 February 2018), para X26, 182 to 185.

²¹³ Consumer NZ, Telco Consumer Survey 2018; Analysys Mason, “Connected Consumer Survey 2018: mobile customer satisfaction in Australia and New Zealand”, slide 11.

²¹⁴ UMR, “Competition for Business Customers in the Mobile industry: A Report for the Commerce Commission”, (December 2015), p 28.

- 4.123 We will also continue monitoring the uptake of bundles that include mobile services to assess whether firms may be using bundles strategically to raise barriers to entry and to limit the market available to competitors.

How easy is it for consumers to act?

- 4.124 The level of switching observed in a market may be indicative of the ability of consumers to act and take advantage of competing offers. Various types of costs consumers incur can impede switching.²¹⁵
- 4.125 However, it is important to understand what underpins the level of switching – including the reasons for switching or not switching, and any barriers to switching – and the implications for consumers. For example:
- 4.125.1 a high level of switching may result in poorer consumer outcomes if consumers end up on plans that make them worse off. For example, research in the UK has found that 17% of consumers switching electricity suppliers ended up worse off;²¹⁶ and
- 4.125.2 a low level of switching may reflect a high level of satisfaction among consumers with their current supplier, with suppliers competing to retain their customers.²¹⁷
- 4.126 Over the past four years the number of mobile subscribers who have ported (kept) their number when switching between suppliers has stayed constant at around 5% per annum.²¹⁸ The Consumer NZ 2018 survey indicates a slightly higher rate of switching (9% in the past 12 months) which could be in part explained by customers relinquishing their number when they switch.²¹⁹ This is slightly lower than numbers for Australia at 10% and the average for 28 European countries at 13%.²²⁰
- 4.127 In our 2015 business mobile market study we found that 14% of businesses had changed mobile provider within the previous two years, and that this was lower

²¹⁵ For example, transaction costs, compatibility costs, learning costs, contractual costs or psychological costs, see Office of Fair Trading (UK) OFT655, “Switching Costs Economics Discussion Paper 5: Part One Economic models and policy implications”, (April 2003), Ch 2.

²¹⁶ Wilson, C., and Waddams Price, C., “Do Consumers Switch to the Best Supplier?”, (10 March 2010).

²¹⁷ This may be by way of suppliers’ drip-feeding incremental improvements to their customers.

²¹⁸ Porting numbers are from the New Zealand Telecommunications Forum (TCF) Number Portability Statistics, overall subscriber numbers are from our Annual Monitoring Questionnaire.

²¹⁹ Consumer NZ, Telco Consumer Survey 2018.

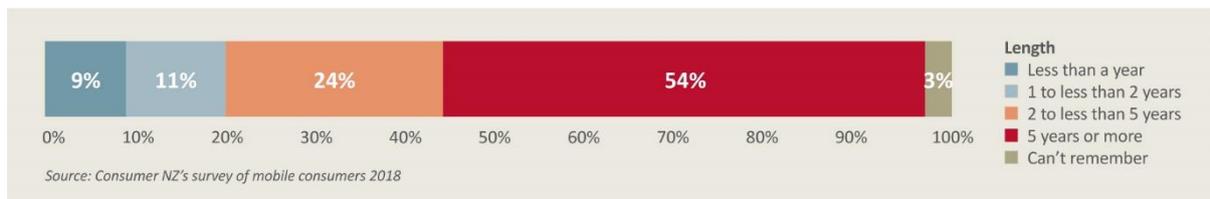
²²⁰ ACCC, “Communications Sector Market Study Final Report”, (April 2018), p 120; European Commission, “Consumer Markets Scoreboard 2018 Edition”, (2018), Fig 25.

than the percentage of businesses that had switched power company (26%) but higher than the percentage that had switched banks (5%).²²¹

4.128 Both 2degrees and Spark submitted that, in their experience, switching levels are higher than the statistics above, as the statistics above exclude ‘internal switches’ where a customer changes plans but not their provider.²²² While we acknowledge that internal switching between plans offered by the same supplier may indicate that consumers are more active, we consider that switching between suppliers is more relevant to competition.

4.129 While the switching statistics show that some consumers are moving, over half of residential consumers have not switched provider in the last five years (see Figure 17).

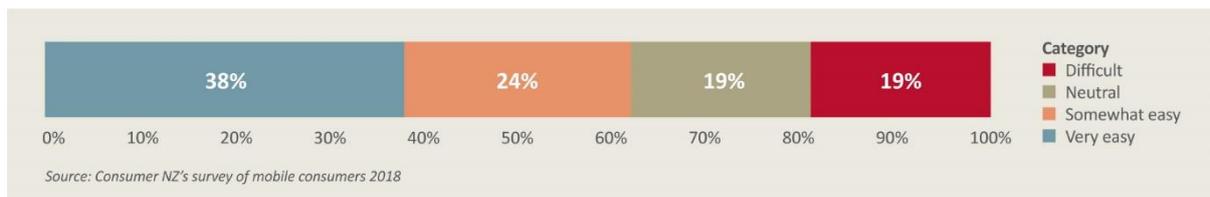
Figure 17 Time with current provider



4.130 There is no fixed proportion of the market that should be expected to switch. Consumers not switching provider is not necessarily a concern if those consumers do not face significant barriers to switching.

4.131 Figure 18 shows that 19% of consumers think that it is difficult to switch.

Figure 18 Perceived ease of switching provider

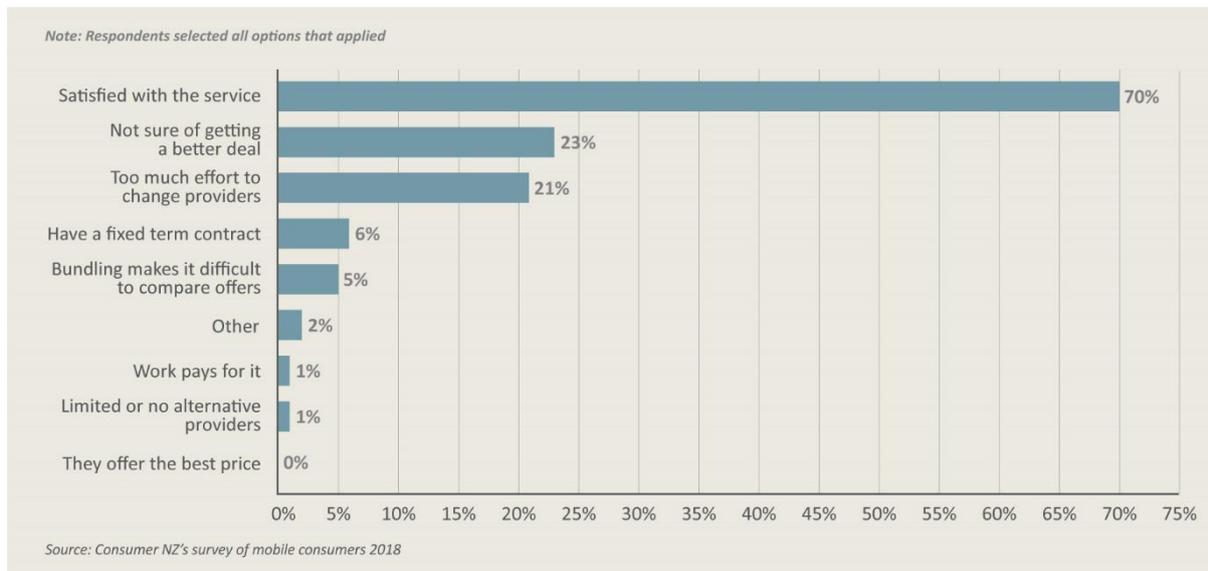


²²¹ UMR Research, “Competition for Business Customers in the Mobile Industry: A Report for the Commerce Commission”, (December 2015), p 91, 96.

²²² 2degrees submission on the Preliminary Findings paper, (28 June 2019), p 13; Spark submission on the Preliminary Findings paper, (28 June 2019), para 59, 60.

4.132 A low level of switching could also reflect that consumers are generally satisfied with their current provider. As shown in Figure 19, 70% of consumers who have not switched in the past 12 months stayed with their current provider because they are satisfied with the service they are receiving.

Figure 19 Main reason for staying with provider



4.133 Spark agreed with this hypothesis, submitting that year-on-year increases in value, quality and other benefits mean that customers are content to remain with their current supplier.²²³ This view was supported by 2degrees during the cross-submission process.²²⁴

4.134 2degrees also noted in its cross-submission that customers can often meet their needs by switching between plans rather than mobile providers.²²⁵

4.135 Although satisfaction with current provider is the most common reason given for not switching, a number of the other reasons given by mobile consumers for remaining with their current provider relate to barriers to switching. These include a lack of confidence of getting a better deal, perceptions around the effort involved in changing providers, and the presence of fixed contracts.

²²³ Spark submission on the Preliminary Findings paper, (28 June 2019), p 2.

²²⁴ 2degrees cross-submission on Preliminary Findings paper, (19 July 2019), p 9.

²²⁵ 2degrees cross-submission on Preliminary Findings paper, (19 July 2019), p 9.

Switching barriers

- 4.136 A number of barriers to switching suppliers have been reduced in the mobile market. This is likely to explain why most consumers consider switching between mobile suppliers to be easy.
- 4.137 Most importantly, the introduction of mobile number portability has reduced switching costs by allowing consumers to retain their numbers when they change suppliers.
- 4.138 Another example relates to handset locking. As previously noted, the practice of locking handsets increases switching costs and has led to us raising concerns over the practice in the past.²²⁶
- 4.139 We will continue to monitor the number of locked handsets and the break fees attached to these phones. Even where break fees do not apply, the inconvenience of having to unlock a device is likely to raise switching costs for the consumer.
- 4.140 There have been cases of consumers on fixed-term contracts that include a handset continuing to pay the same price for mobile services beyond the end of their contract.²²⁷ As pointed out in submissions during this study, this is not a significant issue in New Zealand as there has been a move away from fixed-term contracts which include handsets in the residential market.²²⁸
- 4.141 While the move away from fixed-term contracts for residential customers will have made switching easier, there is likely a trade-off in that contract plans can offer considerably better value. As seen in Australia, twelve-month contracts often offer better value in exchange for the commitment of a contract, particularly enabling much higher data allowances. However, we note that Telstra has recently moved away from mobile plans with fixed-term contracts.
- 4.142 In the business segment, our 2015 business mobile market study found that 73% of businesses surveyed were on fixed-term contracts.²²⁹ Our 2018 annual monitoring questionnaire found that 58% of business customers were on fixed-term contracts. This suggests there may have been a move towards open term contracts, similar to the current trend in the residential on-account segment where the market has moved towards handset payment plans.

²²⁶ While we raised concerns in the past, we also noted that a transparent lock in period that reflects the recovery of subsidised costs may not undermine competition.

²²⁷ Behavioural Insights Team “Applying behavioural insights to regulated markets”, (26 May 2016), p 45.

²²⁸ For example, 2degrees submission on the Issues Paper, (October 2018), p 29; Spark submission on the Issues Paper, (26 October 2018), para 157.

²²⁹ Commerce Commission, “Summary of business mobile market segment study” (30 March 2017).

4.143 We note that while concerns may arise with fixed-term contracts that have excessive terms, we are not opposed to the existence of fixed-term contracts *per se*. The existence of twelve-month contracts alongside pay-monthly plans may be positive from a consumer choice perspective.

Behavioural biases

4.144 We have examined whether consumers, when faced with competing retail offers of mobile services, may make decisions in which they fail to select an offer that would better meet their needs than their current offer. Such decisions may result from ‘behavioural biases’ which inhibit consumers from making better choices.²³⁰

4.145 As discussed above, more than half of respondents to Consumer NZ’s mobile consumer survey reported that they had been with their current provider for more than five years. This may indicate a preference among the majority of mobile consumers for the familiarity of their current supplier (a preference for the ‘status quo’).

4.146 Although a reason given by most mobile consumers for not switching is that they are satisfied with their current provider, we note that mobile consumers tend to compare alternative offers infrequently. As a result, such consumers may be unaware if there are other retail offers available that might better meet their needs.

4.147 It may also be the case that a consumer’s existing supplier offers incremental improvements in value (such as additional data for the same monthly price) in order to retain the customer and to reduce their propensity to shop around. As discussed earlier, both Spark and 2degrees have noted that increases in value, quality and other benefits mean that customers are more likely to remain with their current supplier.^{231,232} This may reinforce a ‘status quo’ bias, even if better offers were available elsewhere.

4.148 Even if consumers were aware of better competing offers, there is research that indicates that consumers “value what they have more than what they might have”. Such an aversion to losing what they currently have may result in consumers

²³⁰ Behavioural Insights Team, “Behavioural Biases in Telecommunications: A review for the Commerce Commission”, (May 2019).

²³¹ Spark submission on the Preliminary Findings paper, (28 June 2019), p 2.

²³² 2degrees cross-submission on Preliminary Findings paper, (19 July 2019), p 9.

missing out on benefits from switching, as competing suppliers would have to offer substantial inducements to get a consumer to switch.²³³

- 4.149 Consumers may also be overconfident in their ability to forecast their usage, for example the number of minutes or the amount of data they will use each month. This may be an issue where demand is changing rapidly, and the costs of incorrectly forecasting usage are high. In this regard, the cost of purchasing additional mobile data appear to be relatively high. For example, Vodafone's mobile data add-ons include \$15 for 1GB, and 2degrees' mobile data add-ons include \$20 for \$1GB.²³⁴
- 4.150 Where a customer's actual usage is higher than expected and results in the customer having to purchase additional data, this can result in a monthly bill that is significantly higher than expected (a form of 'bill shock').
- 4.151 Conversely, where customers overestimate their usage, they may end up with unused minutes and data. Where unused allowances can be rolled over, the customer can carry forward unused balances. However, where this persists, this may indicate that the customer is on a more expensive plan that is necessary to meet their usage.
- 4.152 Spark submitted that it is not convinced that the Commission's analysis of behavioural biases reflects the complexity of customer behaviour. Spark argued that more longitudinal evidence (data over a longer period) is required to be confident that a behavioural bias problem exists. Spark expects that further analysis would confirm that there is no behavioural bias problem.²³⁵
- 4.153 Similarly, Vodafone submitted that customers are often in the best position to make decisions about their plans and that plan decisions can be influenced by several factors that are entirely rational and in the consumer's interest.²³⁶
- 4.154 We agree that consumer decision making is complex and that there can be a wide range of reasons for consumers staying with their provider or plan. To shed light on whether the high number of customers choosing to remain with their mobile supplier is cause for concern, we are currently undertaking some research into the extent to which mobile consumers are on retail plans that do not best suit their needs. This is discussed further below.

²³³ Lunn P. "Telecommunications Consumers: A Behavioural Economic Analysis", (19 January 2012), p 10-11.

²³⁴ Operator websites accessed September 2019.

²³⁵ Spark submission on the Preliminary Findings paper, (28 June 2019), para 57-58.

²³⁶ Vodafone submission on the Preliminary Findings paper, (28 June 2019), p 7.

Are consumers on plans that are suited to their usage?

- 4.155 Although there is some evidence that mobile consumers find it easy to compare retail plans, they only do so infrequently. Consumers may therefore be unaware if there are other retail offers available that might better meet their needs. This is a potentially important issue to ensure that suppliers face the correct incentives to compete for customers. At this stage, we do not have robust evidence on whether mobile subscribers are on plans that are well-suited to their usage.
- 4.156 We are currently analysing mobile bills to understand whether mobile consumers are ‘leaving money on the table’ by remaining on plans that are more expensive than they need to be in order to satisfy their usage. There are two situations where a consumer may be paying too much for mobile services:²³⁷
- 4.156.1 a consumer’s actual usage (in terms of minutes, SMS, and mobile data used per month) is lower than the allowance they are purchasing; or
 - 4.156.2 a consumer’s actual usage could be met using a cheaper plan (either with the same operator or with a competing operator).
- 4.157 Consumers must anticipate their future needs to assess which plan best meets their needs. This can be difficult for consumers,²³⁸ although a number of plans currently available (such as Vodafone’s MyFlex plan) provide consumers with flexibility to adjust in light of their usage.²³⁹ This has been raised as an issue in other markets (such as electricity) where consumers have not necessarily chosen the best plan.²⁴⁰
- 4.158 We will be looking to understand the best approaches to encourage consumers to review their current plans and to consider switching to alternatives that may offer better value. We are undertaking some analysis of mobile bills as part of our wider section 9A monitoring and consumer work, outside of this study.

Potential remedies/actions

- 4.159 It appears that consumers can access information on mobile services, assess alternatives, and switch relatively easily. However, consumers do not appear to frequently compare mobile plans, and there are some features of mobile plans which may reduce the ability of consumers to identify plans that are best suited to

²³⁷ We note that consumers may also be willing to pay more for improved service.

²³⁸ Dr P Xavier, “Behavioural Economics and Customer Complaints in Communications Markets”, (May 2011), Ch 5.

²³⁹ An example in the case of fixed broadband services is Spark’s ‘Unplan’ offers.

²⁴⁰ Wilson, Chris M. and Price, Catherine Waddams, “Do Consumers Switch to the Best Supplier?”, (10 March 2010). This found that 17% of consumers in the UK electricity market reduced their surplus (were worse off) by switching.

their usage. We also note that a large proportion of mobile consumers have remained with their current supplier for five years or more.

- 4.160 The passage of the Telecommunications (New Regulatory Framework) Amendment Act 2018 introduced several new consumer provisions aimed at improving retail service quality (RSQ) through increased information and added consumer protections. These provisions apply to both fixed-line and mobile telecommunications.
- 4.161 Both 2degrees and Vodafone expressed concern in their submissions over possible regulatory action in this area:
- 4.161.1 2degrees commented that it is keen to ensure that the Commission's responses are proportionate to any problem/s that are identified. It also outlined that it would be concerned if an expensive and complex consumer engagement mechanism were to be introduced,²⁴¹ and
- 4.161.2 Vodafone noted that any intervention that limits consumer choice risks creating worse outcomes for New Zealanders.²⁴²
- 4.162 We agree that any regulatory action or intervention needs to be proportionate and take account of the potential costs. At this stage we are not advocating regulatory action in relation to consumer engagement in the mobile market. However, mobile consumers will continue to be considered as part of our wider consumer and RSQ work. This will help ensure that any future interventions are proportionate.
- 4.163 Our analysis of mobile bills is being conducted separately from this mobile market study and the results of this analysis will inform our ongoing monitoring and oversight of the mobile market as well as wider consumer and RSQ activities.
- 4.164 There have been recent legislative changes in Australia to introduce a Consumer Data Right (CDR), which will first apply to banking, followed by energy and then possibly telecommunications.²⁴³ MBIE is considering the role that CDR initiatives could play in the New Zealand commercial and consumer environment. The CDR is essentially a data portability right and has the potential to enable greater levels of transparency and encourage competition between providers.

²⁴¹ 2degrees submission on the Preliminary Findings paper, (28 June 2019), p 13-14.

²⁴² Vodafone submission on the Preliminary Findings paper, (28 June 2019), p 8.

²⁴³ ACCC website, Consumer Data Right, (28 March 2019), <https://www.accc.gov.au/focus-areas/consumer-data-right-cdr-0>.

- 4.165 Establishing a CDR that achieves the desired outcomes is not easy.²⁴⁴ As noted earlier, it appears that mobile consumers are already able to access information about their usage of mobile services. Hence, we are proposing to continue to monitor developments in Australia and other markets rather than recommending the introduction of such a measure in New Zealand.
- 4.166 Price comparison websites can facilitate the comparison of different mobile service plans and lower search costs for consumers. However, there may be concerns over the transparency and independence of these websites and the accuracy of the information they present.²⁴⁵ As price comparison websites cover both mobile and fixed telecommunications services, we will evaluate them further, outside of this study, as part of our wider consumer work.

²⁴⁴ Behavioural Insights Team, “Behavioural Biases in Telecommunications: A review for the Commerce Commission”, (May 2019).

²⁴⁵ Ofcom runs an accreditation scheme for price comparison websites to ensure that comparisons of services are “accessible, accurate, transparent and comprehensive.” See <https://www.ofcom.org.uk/consultations-and-statements/category-2/price-calculator-accreditation>.

Findings on consumer engagement

F13 Most consumers can easily access their mobile usage information, but information on mobile performance (speeds, actual quality of coverage etc) is harder to access.

F14 Most consumers find it easy to compare available plans, but report that they only do so infrequently.

Our evidence shows that the process for residential consumers to switch between mobile suppliers is relatively easy, given that:

- F15**
- a) mobile number portability is available;
 - b) there are low numbers of locked handsets; and
 - c) long-term contracts for residential consumers are not prominent.

Bundling of mobile and fixed-line services, which can increase customer stickiness, does not appear to be widespread in the residential market.

F16 While residential consumers report being able to easily access usage information and compare plans, and that the process of switching appears to be relatively easy, a significant proportion of consumers have not compared plans in the last 12 months and have remained with their current supplier for more than five years. This suggests that there is a degree of consumer inertia, and we have commenced a review of mobile bills to shed light on whether this is cause for concern.

F17 Switching in the business market appears to be more complex and more infrequent than residential mobile services. Businesses typically purchase mobile and fixed services as a package, often through fixed-term contracts, with brand reputation being an important driver. Larger business customers are more sophisticated buyers, generally have more access to specialist advice and support, and are more likely to have dedicated procurement resources.

Chapter 5 State of competition in the mobile market

Purpose and structure of this chapter

Purpose

- 5.1 In this chapter, we set out our views on the state of competition in the mobile market. This draws on our overview of the mobile market in Chapter 3 and on our assessment of the key issues discussed in Chapter 4.

Structure

- 5.2 We first discuss how competition between the existing mobile suppliers has evolved since the entry of the third MNO. We then consider the conditions for further expansion by existing suppliers and for entry of new suppliers. We conclude with our views on whether consumers have been able to take advantage of competition between suppliers of mobile services.

Our view on the state of competition in the mobile market

Existing competition

- 5.3 Competition in the New Zealand mobile market has become more established with the emergence of the third MNO.²⁴⁶ The entry of 2degrees, and the completion of its own national network in recent years, has resulted in mobile consumers now having the choice of three independent network-based competitors, each offering similar levels of population and geographic coverage.
- 5.4 We have previously noted that the entry of 2degrees had a significant impact in terms of improving consumer choice and competitive offerings. When 2degrees first entered in 2009, it initially offered prepaid mobile services,²⁴⁷ with prices that were significantly lower than those offered by Vodafone and Telecom at the time.²⁴⁸

²⁴⁶ For a discussion of established competition, see Yarrow, G., "Report on the impact of maintaining price regulation", (January 2008).

²⁴⁷ 2degrees started offering on account mobile services in 2010.

²⁴⁸ Commerce Commission, "New Zealand Retail Prices for Fixed Line and Mobile Services: A Benchmarking Comparison", (November 2010), p 23.

- 5.5 Both Vodafone and Spark have responded to the entry and expansion of 2degrees. For example:
- 5.5.1 in early 2012, Spark launched its Skinny brand offering prepaid mobile bundles, initially targeting the youth end of the market before refocusing as a budget brand in 2013;²⁴⁹
 - 5.5.2 in 2014, we noted that competition had been more intense in the low to medium use and prepaid segments of the mobile market, as evidenced by a reduction in prices in these segments compared to the OECD average;²⁵⁰ and
 - 5.5.3 in 2016, Vodafone introduced its MyFlex prepaid plan, providing customers with the flexibility to adjust the number of minutes, texts, and data in their prepaid bundles.
- 5.6 Such competition has continued and has extended into the higher value segments of the retail market. For example, all three MNOs now offer bundles of unlimited minutes, SMS and ‘unlimited data’ (although all of these plans have data thresholds, beyond which the quality of the service is degraded). Several recent market developments have improved value for higher usage mobile consumers in New Zealand.
- 5.6.1 In April 2019, 2degrees introduced a shared ‘unlimited’ plan, at \$85 per month with a data threshold of 40GB beyond which speeds are reduced. The price per subscriber drops as additional subscribers are added. Up to four people can subscribe to the plan, at which point each subscriber gets 40GB for \$40 per month. In addition, 2degrees offered a short-term promotion in June 2019, offering a 50% discount on most of its pay-monthly prices for three months.
 - 5.6.2 In May 2019, Skinny added a 40GB plan for \$77, renewing every four weeks. When adjusted to a monthly basis, the Skinny plan offers 43GB for \$83.
 - 5.6.3 As Spark noted in its submission on the Preliminary Findings paper, it recently increased the threshold at which speeds are throttled on its ‘unlimited’ mobile plans, from 22GB to 40GB.²⁵¹ According to Spark, there

²⁴⁹ Commerce Commission, “Annual Telecommunications Monitoring Report 2014”, (June 2015), p 25.

²⁵⁰ Commerce Commission, “International Price Comparison for Retail Mobile Telecommunications Services 2013”, (March 2014), p 17.

²⁵¹ Spark submission on the Preliminary Findings paper, (28 June 2019), para 9c.

has been a significant shift towards such plans in the New Zealand market.²⁵²

- 5.6.4 Vodafone has also recently increased the threshold on its ‘unlimited’ plans, from 22GB to 40GB.
- 5.6.5 In September 2019, Kogan Mobile commenced offering prepaid mobile plans with unlimited calls and SMS, and up to 32GB per month. Subscribers can pay in advance for 30 days, 90 days, or 365 days.
- 5.7 As shown earlier in Figure 3, the overall market shares of the three MNOs have been quite stable in recent years. Over the five years to 2018, Spark’s share of mobile subscribers increased from 34% to 38%, largely as a result of Skinny’s increase in the prepaid segment. Vodafone’s share has dropped from 44% to 41%, with declines in the residential segment and gains in the business segment.
- 5.8 2degrees’ overall market share has been flat in recent years, and it has a relatively high proportion of prepaid customers, resulting in a lower ARPU. However, it has been continuing to expand in the higher value residential on-account segment, albeit at a growth rate that appears to be slowing.
- 5.9 As discussed in Chapter 3, prices of mobile services in New Zealand have been falling, as evidenced by ARPU and usage trends. The volume of mobile voice minutes and mobile data used by each mobile subscriber has continued to increase, although average mobile data usage in New Zealand remains relatively low by international standards. This may be due to a number of factors, including pricing of higher usage bundles and the availability and quality of fixed networks in New Zealand.
- 5.10 A number of submissions throughout this study have argued that the mobile market in New Zealand is competitive and has been performing well.²⁵³ Other submitters put forward a different view, that competition is not effective at the retail (and wholesale) level, and that 2degrees had struggled to compete as a result of its limited network coverage and its reliance on roaming.²⁵⁴

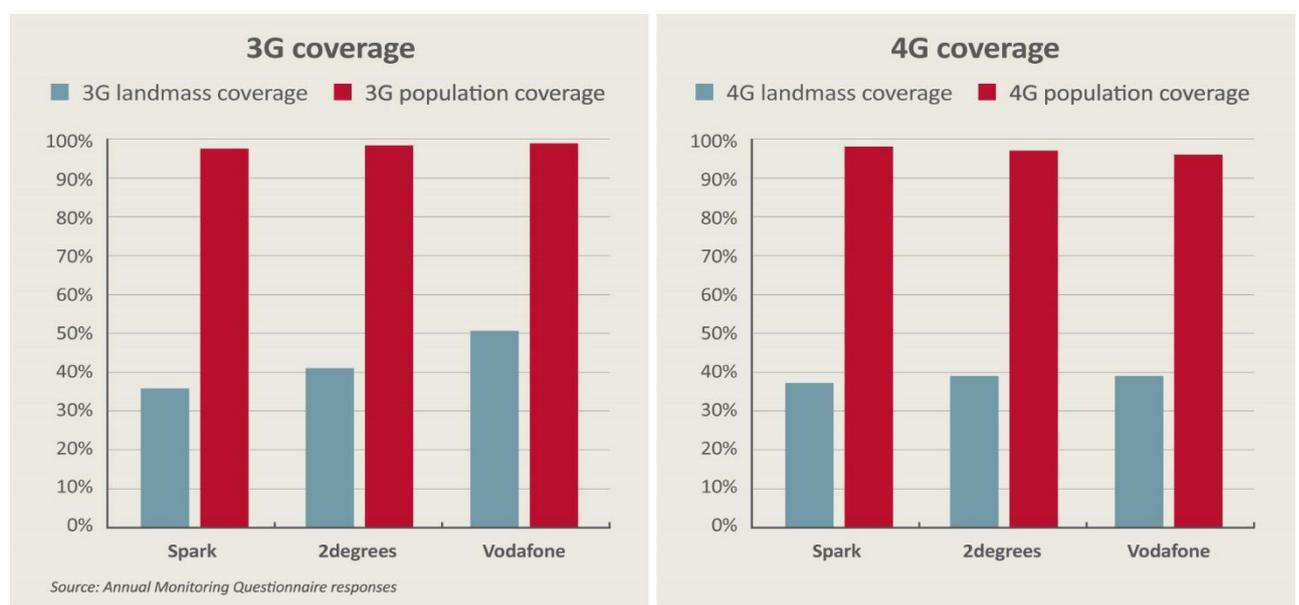
²⁵² Spark cross-submission on Preliminary Findings paper, (19 July 2019), para 10.

²⁵³ Spark submission on the Issues paper, (26 October 2018), p 2; NERA, “Competition in the New Zealand Mobile Market”, (26 October 2018), para 29, 32, 34; 2degrees submission on the Issues paper, (26 October 2018), p 7; Vodafone submission on the Issues paper, (26 October 2018), p 3. Also see submissions from these parties on the Preliminary Findings paper.

²⁵⁴ Trustpower submission on the Issues paper, (26 October 2018), para 3.1.1; Vocus submission on the Issues paper, (26 October 2018), para 11; WISPA NZ submission on the Issues paper, (26 October 2018), p 2. Also, see submissions on the Preliminary Findings paper.

- 5.11 We note that as it was deploying and expanding its own network, 2degrees' reliance on roaming may have constrained its ability to independently compete in some segments. 2degrees entered by building its own mobile network in the main centres (initially covering 47% of New Zealand's population with its own network) and relying on roaming on Vodafone's mobile network in order to be able to offer national coverage.
- 5.12 2degrees has since extended its own network coverage to reach levels similar to the other MNOs. Figure 20 summarises the latest information available from our 2018 annual monitoring questionnaire, showing 3G and 4G coverage of each MNO.

Figure 20 Total national 3G and 4G coverage (2018)



- 5.13 As 2degrees invested in expanding its own network coverage, its reliance on roaming on Vodafone's network has diminished. 2degrees submitted that it relies on roaming for less than 1.5% of its traffic.²⁵⁵ This is consistent with the responses to our annual monitoring questionnaire.
- 5.14 There is some evidence that in the past, 2degrees' smaller network footprint may have created reputational challenges in serving some segments of the mobile market. For example, in our 2015 mobile market study into the business segment of the mobile market, we found a general perception among business customers that 2degrees offered a lower service quality and less extensive coverage.

²⁵⁵ 2degrees submission on the Issues paper, (26 October 2018), p 2.

- 5.15 However, we also found that those business customers who subscribed to 2degrees were the most satisfied (93% of business customers were satisfied with their mobile service, compared to 77% for Spark and 81% for Vodafone).²⁵⁶
- 5.16 After 10 years in the mobile market, 2degrees has an established track record as an MNO in New Zealand and a number of parties have acknowledged that perceptions of 2degrees appear to be changing.²⁵⁷ We also note that 2degrees is the only telecommunications provider to appear in Colmar Brunton’s Corporate Reputation Index in 2019, which is a measure of New Zealand’s most respected brands.²⁵⁸
- 5.17 According to 2degrees, the completion of its network build means that the structure of the New Zealand mobile market is set for increased retail and wholesale competition:²⁵⁹
- Achieving a comparable footprint to its competitors means New Zealand now has three truly national network operators. This creates enduring competitive tension because 2degrees, as the newest entrant, is strongly incentivised to continue growing to deliver a return on past investment – and fund upcoming 5G deployment.
- 5.18 As noted earlier, 2degrees has invested in the development of wholesale arrangements through its MVNE platform, which allows wholesale customers to develop their own differentiated products.²⁶⁰
- 5.19 It therefore appears that 2degrees is well-positioned to compete in the supply of mobile services across all customer segments.
- 5.20 However, as we discuss in Chapter 4, the ability of each MNO to compete going forward will also depend on the amount and type of spectrum held by the MNOs.

Conditions for further expansion and entry

- 5.21 In considering the ability of existing suppliers of mobile services to expand further, and new suppliers to enter, we have examined potential barriers to entry and expansion which could influence competition in the New Zealand mobile market going forward.

²⁵⁶ UMR Research, “Competition for Business Customers in the Mobile Industry: A Report for the Commerce Commission”, (December 2015), p 87.

²⁵⁷ For example, WISPA NZ submission on the Issues paper, (26 October 2018), p 2.

²⁵⁸ Colmar Brunton, “Corporate reputation Index 2019”, available at <https://www.colmarbrunton.co.nz/wp-content/uploads/2019/04/Colmar-Brunton-Corporate-Reputation-Report-April-2019.pdf>.

²⁵⁹ 2degrees submission on the Issues paper, (26 October 2018), p 1.

²⁶⁰ 2degrees submission on the Issues paper, (26 October 2018), p 17.

- 5.22 For MNOs, access to adequate spectrum will be an important issue to sustain competition and to accommodate rapidly growing demand for services supplied over mobile networks, particularly mobile data and wireless broadband services which require significant capacity. We note that disparities in spectrum holdings can potentially affect downstream competition, and that this may be a particularly important issue for consideration in the upcoming allocation of 3.5 GHz spectrum.
- 5.23 As discussed in Chapter 4, there does not appear to be a case for regulatory intervention to promote a fourth MNO to enter the market. However, we consider it appropriate to allow parties other than the existing three MNOs to participate in future spectrum acquisition processes.
- 5.24 The availability of national roaming is also important for an entrant as it builds out its own network. National roaming allowed 2degrees to offer widespread coverage as it invested in its own network. Roaming remains a specified service in Schedule 1 of the Telecommunications Act.
- 5.25 For MVNO-based competitors, the availability of MVNO access on competitive terms will influence the ability of MVNOs to enter and evolve in the retail market. We note that there are a range of MVNO operating models, and we have assessed information on existing and potential MVNOs in New Zealand.
- 5.26 Until recently, competition between the MNOs to supply wholesale mobile services to MVNOs appears to have been subdued. Absent competition from 2degrees, the other MNOs appear to have shown little interest to offer MVNO access, suggesting unsatisfactory wholesale market conditions for MVNOs.
- 5.27 There is some evidence to suggest that competitive conditions at the wholesale level have recently been improving, with 2degrees more aggressively pursuing wholesale opportunities. As discussed in Chapter 4, 2degrees has invested in the platforms and systems to support more independent and differentiated MVNO models. This is evidenced by its efforts to attract Trustpower's MVNO business. Vocus recently submitted that it intends to test the wholesale market by issuing an RFP for its MVNO business.
- 5.28 The other MNOs appear to have been responding. 2degrees submitted that it has driven a 'positive competitive dynamic' for MVNOs, with Trustpower announcing that it will be launching retail services following a competitive MVNO process won by Spark.²⁶¹ We also note that Kogan Mobile has recently launched MVNO-based mobile services.

²⁶¹ 2degrees submission on the Preliminary Findings paper, (June 2019), p 3.

- 5.29 2degrees is likely to face ongoing incentives to attract MVNOs onto its network in order to recover its investment in its MVNE platform, and to help it grow mobile volumes and achieve economies of scale. Its ability to continue to do so is likely to depend on gaining adequate spectrum in future allocations.
- 5.30 We therefore consider that competitive conditions are emerging that are likely to support commercial MVNO activity where there is a market opportunity for such services. The prospects for MVNO-based entry and expansion are also likely to depend on whether consumers of mobile services are actively engaged and prepared to switch between suppliers.

Consumer engagement

- 5.31 As competing suppliers emerge in a market, the increased range of choice and offers can give rise to issues around the level of consumer engagement and confidence. As we have noted, if consumers find it difficult to compare proliferating offers and to choose the services that best meet their needs, this is likely to create barriers to entry and expansion in the supply of mobile services.
- 5.32 In Chapter 4, we examined the available evidence on the ability of consumers to compare alternative offers and to switch between service providers.
- 5.33 It is important for consumers of mobile services to be able to easily access information on their usage and to compare retail prices of mobile services. It appears that most consumers can easily get information on their monthly usage, such as the number of minutes and texts, and the amount of data they use (although usage history is often limited to a short time period eg, one month). Consumers also appear to find it easy to compare retail plans, but only do so infrequently.
- 5.34 Non-price features of mobile services are less visible to consumers, including information on speeds and the extent and quality of coverage.
- 5.35 Switching between mobile suppliers appears to be relatively easy, given that mobile number portability is available, there are low numbers of locked handsets, and that long-term contracts for residential consumers are not prominent in New Zealand. Despite this, a significant proportion of consumers have remained with their current supplier for more than five years, suggesting a degree of customer inertia.
- 5.36 A key reason why consumers state they remain with their current supplier is that they are satisfied with their service. However, this does not generally reflect active comparison by many consumers of alternatives and may simply reflect a status quo bias encouraged by gradual improvements in plan content. Consumers give a

variety of reasons for remaining with their current supplier, including the customer being unsure whether they could get a better deal elsewhere.

Findings on the state of competition

F18

Our view is that competition in the retail mobile market has become more established with three independent, national network-based competitors. This has resulted in mobile consumers benefitting from an increasingly competitive market environment.

F19

There remain some areas where we anticipate competitive outcomes for consumers could improve further, such as pricing for higher usage bundles of mobile services, (although recent market developments have improved consumer outcomes for higher usage bundles). Average mobile data usage in New Zealand remains low by international standards, which may be due to a number of factors, including pricing of higher usage bundles and the availability and quality of fixed networks (including WiFi hotspots) in New Zealand.

F20

We believe that the conditions for effective competition exist, with the three MNOs each having a network of similar technology with similar geographic and population coverage metrics. We consider that:

- a) spectrum must be allocated with wholesale and retail competition matters at the forefront of decisions;
- b) with the pre-conditions for competition in place and the adequate allocation of spectrum, we would expect MVNO services to continue to develop where market opportunities exist; and
- c) there may be room for improved consumer engagement, to ensure that consumers are aware of and able to easily take advantage of competing offers to drive competition.

Actions on the state of competition

A1	We will continue to engage with MBIE on the importance of the upcoming spectrum allocation/auctions for delivering competitive outcomes in the mobile market.
A2	We have amended the annual monitoring questionnaire to capture information on the development of MVNO market share and business sustainability. We also intend to periodically review commercial MVNO arrangements. This will provide us with greater ongoing visibility of the terms being offered to MVNOs, and how the commercial terms compare to key price and non-price dimensions of MVNO access.
A3	<p>We will undertake further work as part of our wider responsibilities under section 9A and Part 7 of the Telecommunications Act (outside of this study) to:</p> <ul style="list-style-type: none">a) improve our understanding of the extent to which consumers can and do access, assess and act on relevant information in the mobile and wider telecommunications markets;b) assess consumers' choices of mobile plans against their usage, including quantification of the potential savings mobile consumers could make if they were on plans that better match their usage; andc) assess the quality of services provided by mobile suppliers and the extent to which consumers are actively engaged in the mobile market, as part of our wider retail service quality programme, including our ability to review or create retail service quality codes if appropriate.

Chapter 6 Future developments in mobile services

Purpose of this chapter

- 6.1 This chapter sets out our analysis of some of the key issues relating to the future development of the mobile market—in particular, those issues raised throughout the study. These include potential future developments in the supply of mobile services and our views on their potential effects on competition.
- 6.2 One of the aims for this study was to gain a better understanding of how mobile markets are currently performing and developing, and to consider how the mobile landscape may evolve in the future.²⁶² This chapter attempts to address the second aspect of that aim.
- 6.3 The selection of future developments in this chapter is a subset of the potential future developments in mobile technology and trends and is not intended to be exhaustive. 5G and eSIMs are potentially transformative technologies. Network slicing and increased infrastructure sharing have the potential to alter the investment profiles for MNOs and access conditions for MVNOs. For a fuller and broader investigation of future trends please refer to the Red Dawn “Global Industry Trends” Report.²⁶³

5G mobile networks

- 6.4 5G is the next generation of mobile technology and will require mobile operators to invest in spectrum and in key network infrastructure, including radio access network equipment, backhaul and core networks.²⁶⁴
- 6.5 The competition between 5G networks in New Zealand and the timing of their deployment will be heavily dependent on the upcoming spectrum allocations. Operators must also navigate their proposed 5G infrastructure and network deployment plans through the statutory process administered by the Government Communications Security Bureau (GCSB) before they are able to commence deployment.²⁶⁵

²⁶² Commerce Commission, “Scope for our study of mobile telecommunications markets in New Zealand”, (27 March 2018), para 2.

²⁶³ Red Dawn Consulting, “Global mobile industry trends: Implications for New Zealand”, (April 2019).

²⁶⁴ Ferry Crijpink, Alexandre Ménard, Halldor Sigurdsson, and Nemanja Vucevic, “The road to 5G: The inevitable growth of infrastructure cost”, McKinsey & Company, (February 2018).

²⁶⁵ This process is set out in the Telecommunications (Interception Capability and Security) Act 2013.

- 6.6 The statutory process relates to identifying and mitigating any network security risks that may arise in relation to public telecommunications networks. In November 2018, following a media release by Spark, the GCSB confirmed that it had identified a network security risk associated with Spark’s planned use of Huawei’s equipment within its 5G radio access network.^{266,267} The GCSB process is ongoing, and Spark has the opportunity to mitigate the concerns raised by the GCSB.
- 6.7 In the event those concerns cannot be mitigated to the GCSB’s satisfaction, the ultimate decision will rest with the Minister responsible for the GCSB. Only the Minister responsible for the GCSB can issue a direction to prevent, sufficiently mitigate, or remove a network security risk identified by the GCSB.
- 6.8 In making such a direction, the Minister responsible for the GCSB must consult with the Minister for Trade and Export Growth and the Minister for Broadcasting, Communications and Digital Media, and must have regard to additional factors including:
- 6.8.1 the impact on the MNO of meeting the costs associated with the direction;
 - 6.8.2 the potential consequences that the direction may have on competition and innovation in telecommunications markets; and
 - 6.8.3 the anticipated benefits to New Zealand from preventing, sufficiently mitigating, or removing the network security risk.
- 6.9 The consequences of any decision that has the effect of excluding or restricting the involvement of Huawei, or any equipment supplier, in the roll-out of 5G networks could potentially affect the development of competition and the costs of deploying 5G networks in New Zealand.
- 6.10 In commenting on the GCSB decision, 2degrees has referred to the importance of multiple vendors to deliver price competition, and that if the GCSB decision is confirmed and extended to 2degrees, “it will be a real disappointment for competition.”²⁶⁸ Spark has also commented publicly that “Huawei had been a very competitive provider of services that had helped keep the vendor market honest.”²⁶⁹

²⁶⁶ GCSB statement, (28 November 2018); <https://www.gcsb.govt.nz/news/gcsb-statement/>.

²⁶⁷ Spark, “GCSB declines Spark’s proposal to use Huawei 5G equipment”, (28 November 2018).

²⁶⁸ <https://www.stuff.co.nz/business/108940155/gcsb-declines-huawei-proposal>.

²⁶⁹ <https://www.stuff.co.nz/business/industries/108261662/kiwi-mobile-phone-users-would-pay-for-5g-ban-on-chinas-huawei-2degrees-warns>.

- 6.11 The roll-out of 5G networks will enable MNOs to further benefit from supply side economies of scope by offering multiple services over the same infrastructure, particularly fixed wireless, mobile services and IoT. While there is a lot of industry and media interest about innovation and new applications using 5G technology in areas such as production, smart devices, agriculture, and entertainment, the initial focus from MNOs in New Zealand appears to be in the enhanced capacity for mobile and fixed wireless broadband.²⁷⁰
- 6.12 In its initial phase, 5G is likely to be a basic overlay on existing 4G technology platforms. The 3rd Generation Partnership Project, which is the international body that governs cellular standards, has completed and published the 5G technical standards. This allows for the deployment of fully compliant 5G networks, on top of existing legacy LTE networks.
- 6.13 Much like the transitions from 3G to 4G and 4.5G, the initial launch of 5G in New Zealand is likely to involve the replacement of equipment on existing base stations. If data usage continues to grow exponentially, and new use cases come online, higher spectrum frequencies and additional cell sites are likely to be needed. This may increase the cost of further 5G deployment compared to the initial phase and potentially increase the complexities and scale for consenting, site sourcing, site access and environmental consents.²⁷¹
- 6.14 Spark, Vodafone and 2degrees have all indicated that they plan to roll out competing 5G networks by leveraging their existing network infrastructure.²⁷² Vodafone has announced that it will initially launch 5G services in select locations in Auckland, Wellington, Christchurch and Queenstown in December 2019, using its existing 3.5GHz spectrum holdings (which are due to expire in 2022) and with Nokia Networks as its technology partner.²⁷³ Spark has also signalled its intention to launch 5G services as soon as spectrum becomes available.²⁷⁴
- 6.15 Dense Air's recent entry into New Zealand, and its wholesale small-cell infrastructure sharing approach, potentially provides a complementary service to the existing MNOs that will improve 4G and 5G services.

²⁷⁰ Spark, "5G: The evolution towards a revolution: Briefing Paper", (August 2018), p 11.

²⁷¹ Land Access and the National Environmental Standard for Telecommunication Facilities concerns were raised in a number of submissions to RSM's "Preparing for 5G in New Zealand" discussion document.

²⁷² Spark submission on "Preparing for 5G in New Zealand: Discussion Document", (30 April 2018) p 1, Vodafone New Zealand submission on "Preparing for 5G in New Zealand: Discussion Document", (May 2018), p 2, and 2degrees submission on "Preparing for 5G in New Zealand: Discussion Document", p 2.

²⁷³ <https://news.vodafone.co.nz/article/vodafone-5g-launch-marks-day-one-new-ownership>

²⁷⁴ <https://www.sparknz.co.nz/news/fy19-results/>.

- 6.16 Spark and Vodafone have also leveraged their mobile infrastructures to deploy IoT networks in New Zealand, in anticipation of the expected increase in the demand for IoT applications across a wide range of industry sectors including agriculture, transport and horticulture. These networks compete with standalone IoT networks that use different wireless technologies. Standalone IoT networks that have also launched recently in New Zealand include Kotahinet and Thinkxtra.

eSIMs

- 6.17 An eSIM is a chip that is soldered directly onto a device's circuit board and performs the functions that are today undertaken by a physical SIM card. Instead of the user having to physically switch SIMs in the device to change networks, this can be conducted over-the-air or by electronic means instead.
- 6.18 eSIMs can be embedded in traditional handsets, tablets, wearable technology (eg, smart watches) and IoT applications.²⁷⁵ eSIMs offer the opportunity to eventually make the switching experience seamless as there are no physical elements to contend with; all aspects of switching can be done remotely.
- 6.19 eSIMs could benefit MVNOs that wish to bulk transfer their customer base in the event of switching from one host MNO to another. eSIMs could also enable MVNOs to differentiate further in niche markets and on pricing, allowing consumers to seamlessly switch to the best offers available and to stimulate regular switching.
- 6.20 eSIMs could also create opportunities for global handset makers or OTT players to become 'mega MVNOs' and possibly leverage this position to get better deals from MNOs. An early example of this is Google's ProjectFi in the USA.
- 6.21 There are three prerequisites for the benefits of eSIMs to be realised. Firstly, there need to be eSIM devices. Secondly, carriers must support eSIMs. This is the most critical requirement. Lastly, supporting systems are required to enable customers to switch between providers.²⁷⁶
- 6.22 The US Department of Justice recently acknowledged the importance of supporting eSIMs in its Proposed Final Judgment on the T-Mobile/Sprint merger. One of the conditions on the merger is that the merged entity, as well as a third party

²⁷⁵ Apple iPhone XR, XS, and XS Max and Google Pixel 2, 2XL, 3, 3XL, 3A and 3A XL and NUU Mobile X5 handsets are currently the only e-SIM capable handsets.

²⁷⁶ Wik Consult, "Economic aspects of embedded SIM for the telecommunications consumer segment", (2017).

acquiring divested assets (Dish), agrees to support eSIM technology on smartphones.²⁷⁷

6.23 Spark is currently the only New Zealand MNO to support eSIMs on its network, but this support is limited to a select few devices.²⁷⁸ Vodafone indicated that eSIMs would be supported on its network by the first quarter of 2019, though this has yet to happen.²⁷⁹ 2degrees has stated its intention to support eSIMs but has not given a concrete timeframe.

6.24 Chorus noted in its submission on our Preliminary Findings that “The potential benefits of eSIMs will likely require changes to, or uptake of, new hardware and processes. They may also require changes to processes for Mobile Number Portability”.²⁸⁰ Chorus also encouraged us to satisfy ourselves that MNOs’ indications that they will support eSIMs are met, enabling the use of devices across multiple mobile networks.

6.25 Uptake of eSIM devices is predicted to be modest, with the Red Dawn Emerging Trends Report stating that:²⁸¹

The number of eSIM devices could reach anywhere between 148 million to 420 million shipments in 2022.... Smartphones will contribute to nearly two-thirds of all eSIM device shipments by 2022. Despite such spectacular growth, less than 5% of smartphones sold globally in 2022 will be eSIM compatible.

6.26 As submissions to the Issues Paper noted, eSIMs may not only affect customers. Spark highlighted that eSIMs could also potentially alter the distribution channels of mobile providers and facilitate service providers’ ability to sell mobile plans and services digitally if they had an agreement with an MVNO and an OTT provider.²⁸²

6.27 Spark also suggested that “...eSIMs may well transform devices – smartphones, iPads, wearables – into digital distribution channels for mobile providers that lack physical stores or pre-existing relationships with retail channels.”²⁸³ 2degrees expects that modest cost savings could be realised from eSIMs as the need to distribute physical SIM cards diminishes.²⁸⁴

²⁷⁷ See Department of Justice, “Proposed Final Judgment”, (26 July 2019), p 21.

²⁷⁸ <https://www.spark.co.nz/esim>.

²⁷⁹ https://www.nzherald.co.nz/business/news/article.cfm?c_id=3&objectid=12130793.

²⁸⁰ Chorus submission on the Preliminary Findings paper, (28 June 2019), p 3.

²⁸¹ Red Dawn Consulting, “Global mobile industry trends – Implications for New Zealand”, (24 April 2019), p 32.

²⁸² Spark submission on the Issues paper, (26 October 2018), p 29.

²⁸³ Spark submission on the Issues paper, (26 October 2018), p 27.

²⁸⁴ 2degrees submission on the Issues paper, (26 October 2018), p 40.

6.28 Given the potential of eSIMs to enhance retail and wholesale competition and to lower switching barriers,²⁸⁵ we would be concerned with behaviour that sought to reduce the competitive benefits of eSIMs, for example:

6.28.1 eSIM locking that could increase switching costs for owners of carrier-locked wearables;

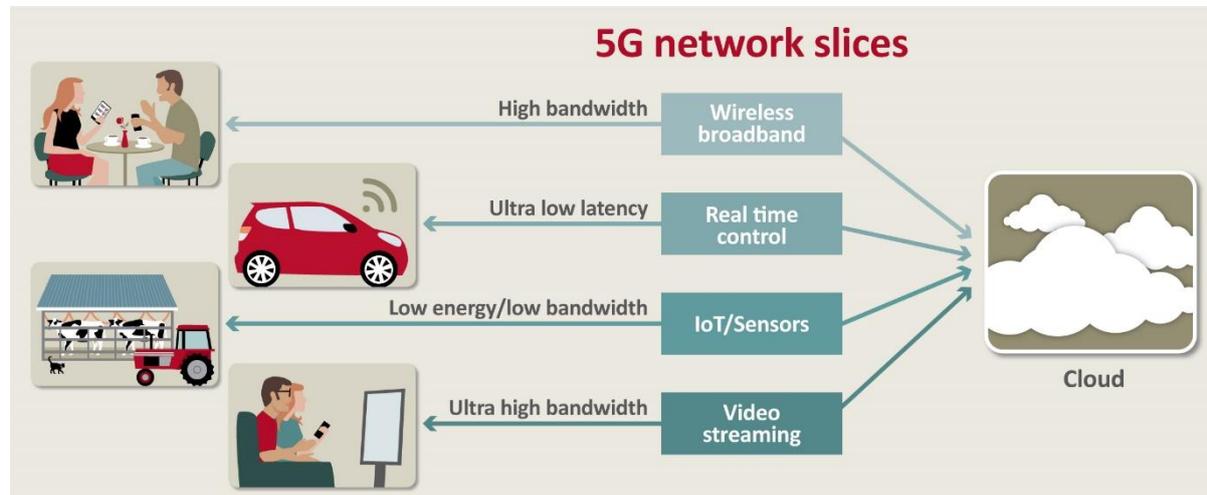
6.28.2 exclusion of other mobile service providers, such as MVNOs; and

6.28.3 limited or restrictive offering of eSIM devices that unduly restrict the functionality of eSIM devices.

Network slicing

6.29 Network slicing is a form of virtual networking architecture. In simple terms, it allows network owners to divide up their physical network into multiple virtual end-to-end networks. This virtualisation enables a variety of different services to be offered, each able to be carefully tailored.²⁸⁶ Such services may include IoT, fixed wireless services, mobile gaming and new forms of MVNO access, as shown in Figure 21.

Figure 21 5G Network slices



²⁸⁵ See Vocus submission on the Preliminary Findings paper, (28 June 2019), p 6.

²⁸⁶ Mohammad Asif Habibi et al, "Network Slicing in 5G Mobile Communications: Architecture, Profit, Modelling and Challenges", Conference Paper, (August 2017).

- 6.30 Network slicing uses virtualisation technologies such as Network Function Virtualisation or Software Defined Networking. These technologies offer an effective way to exploit the benefits of a common network infrastructure, enabling operators to establish and run multiple network services in parallel.^{287 288}
- 6.31 5G network slicing should enable network operators to develop a broader service portfolio and accordingly diversify, expand and increase ongoing revenue streams by providing higher quality innovative services that may have a higher ARPU.
- 6.32 This has the potential to enable non-traditional providers such as Apple and Google to purchase dedicated network slices to run their services. These providers will still be reliant on the MNO networks and may provide complementary services rather than providing an additional competitive constraint on MNOs.²⁸⁹
- 6.33 In addition, it is possible that the forthcoming spectrum auction offers up possibilities for MNOs to create opportunities for more MVNO entry using network slicing technology.

Infrastructure sharing

- 6.34 Infrastructure sharing arrangements can result in cost efficiencies by lowering the cost of network deployment. However, such arrangements can also produce a range of detriments through reduced infrastructure-based competition. Such detriments may include higher prices (leading to a reduction in allocative efficiency) as well as lower levels of innovation (a loss of dynamic efficiency). As a result, infrastructure sharing will involve a trade-off between different forms of efficiencies.
- 6.35 Infrastructure sharing has the potential to affect the economics and speed of LTE and then 5G deployments, although the overall impact is difficult to predict at this early stage of development.
- 6.36 Chorus also highlighted the potential for competition effects due to a risk that competitive retail tension may decrease with infrastructure sharing agreements between vertically integrated suppliers. We note Chorus' concern and reiterate the

²⁸⁷ Matias Richart et al., "Resource Slicing in Virtual Wireless Networks: A Survey", *IEEE Transactions on Network and Service Management*, Vol. 13 Issue 3, (September 2016), p 462.

²⁸⁸ Nokia, "Dynamic end-to-end network slicing for 5G", (June 2016).

²⁸⁹ Matteo Vincenzi et al, "Multi-Tenant Slicing for spectrum Management on the Road to 5G", *IEEE Wireless Communications Magazine*, Vol. 24, No. 5, (October 2017), p 118- 125. Konstantinos Samdanis et al, "From Network Sharing to Multi-tenancy: The 5G Network Slice Broker", *IEEE Communications Magazine*, Vol. 54, Issue: 7, (July 2016).

point made immediately above that, presently, predicting the likely competition effects is difficult.²⁹⁰

6.37 On the other hand, TUANZ's submission is strongly supportive of infrastructure sharing, especially in rural areas, noting that effective infrastructure sharing is more likely to mean that rural end users experience similar levels of connectivity quality as their urban counterparts.²⁹¹

6.38 BEREC, the Body of European Regulators for Electronic Communications, has recently produced a snapshot of infrastructure sharing arrangements across European National Regulatory Authorities. BEREC defines infrastructure sharing as follows:²⁹²

Mobile infrastructure sharing (both passive and active) describes the process by which operators share infrastructure to deliver a mobile service to end users. "Passive sharing" is the sharing of the passive elements of network infrastructure such as masts, sites, cabinet, power, and air conditioning. "Active sharing" is the sharing of active elements in the radio access network such as antennas and radio network controllers (RNC).

6.39 The trade-off between the costs of deployment and infrastructure competition may become more pronounced given the potential densification of cell sites required for 5G.

6.40 In this context, the infrastructure established by the Rural Connectivity Group (RCG) could be relevant. The RCG plans to deploy 520 cell sites and share spectrum to improve rural coverage and connectivity under the RBI2 and MBSF. According to RCG:²⁹³

The cell sites we build will be shared by New Zealand's mobile network operators – Vodafone, Spark, 2degrees – to provide mobile services from all three mobile companies and ensure competitive broadband services to rural customers. The towers will also be open access for wireless internet service providers to utilise. The infrastructure will allow all operators to share the radio access network equipment and one set of antennas, meaning the size of the infrastructure can be flexible to suit the geographic location.

6.41 Depending on its configuration, parts of the RCG infrastructure could be reused for future deployment of 5G technology by MNOs, at lower cost than a greenfield implementation. In this way, it is possible that it will be economic to provide 5G services in areas where it might otherwise be uneconomic.

²⁹⁰ Chorus submission on the Preliminary Findings paper, (28 June 2019), p 2.

²⁹¹ TUANZ submission on the Preliminary Findings paper, (28 June 2019), para 39-39.

²⁹² BEREC, "Report on Infrastructure sharing", (14 June 2018), BoR (18) 116, p 2.

²⁹³ Rural Connectivity Group's website "Why is RCG unique" - <https://www.thercg.co.nz/why-is-rcg-unique/>.

- 6.42 Infrastructure sharing arrangements are likely to facilitate 5G coverage, particularly in more rural areas. 2degrees submitted that although the viability and form of 5G infrastructure sharing in different regions is yet to be determined, 2degrees expects that 5G infrastructure sharing will largely follow 4G:
- 6.42.1 infrastructure competition in areas of high traffic/capacity demand;
 - 6.42.2 passive infrastructure sharing and co-location in areas with moderate to low traffic/capacity demand; and
 - 6.42.3 active infrastructure sharing in areas of low traffic density, with access to RCG facilities in RBI2 areas.²⁹⁴
- 6.43 2degrees reiterated its preference for issues surrounding infrastructure sharing to be addressed commercially by the parties in the first instance, due to the extant uncertainties and complexities. 2degrees sees no requirement for regulatory intervention at this stage.²⁹⁵
- 6.44 We acknowledge the WISPA NZ submission on the Issues Paper that infrastructure sharing may enable rural consumers to benefit from 5G sooner than having separate networks, although it is too early to say definitively. In its submission, WISPA NZ also noted that RCG infrastructure is potentially important to the roll-out of 5G in rural areas — although this depends on whether the intended location of the RCG towers is suitable to support higher frequency transmissions, and whether the quality of backhaul available at those towers is adequate to support 5G.²⁹⁶
- 6.45 In the case of the RCG joint venture that facilitated improved connectivity under the RBI2 and the MBSF, the Telecommunications Act provides these programmes with restrictive trade practices (RTP) authorisation under the Commerce Act.²⁹⁷
- 6.46 We note that any new infrastructure sharing arrangements could potentially require RTP authorisation under the Commerce Act.
- 6.47 We also note that any new authorised infrastructure sharing to support 5G deployments could include conditions relating to third party access to shared infrastructure. In the case of the RCG, it has a Deed of Open Access Undertakings (the Deed) that includes non-discrimination obligations.

²⁹⁴ 2degrees submission on the Issues paper, (26 October 2018), p 31-33.

²⁹⁵ 2degrees submission on the Preliminary Findings paper, (28 June 2019), p 4.

²⁹⁶ WISPA NZ submission on the Issues paper, (26 October 2018), p 3.

²⁹⁷ Section 156AZF of the Telecommunications Act 2001.

- 6.48 The non-discrimination provision in the Deed states that the “RCG will ensure there is non-discrimination in relation to the supply of a Relevant Service”.²⁹⁸ The Relevant Services are Wholesale Tower Co-location and Wholesale Backhaul.
- 6.49 Where sharing extends to radio spectrum, there may be additional efficiency gains in terms of spectrum usage. For example, if blocks of spectrum are awarded to different parties, some spectrum must be used as guard bands to prevent interference. If a single block of spectrum is awarded and shared, the amount of spectrum set aside as guard bands may be reduced, freeing up more spectrum to be used.

Findings on future developments in the mobile market

F21	5G will initially be an evolution over existing networks, and over time network densification will occur. Investment in 5G may alter the economics of mobile provision and raises the prospect of greater infrastructure sharing, and larger incentives to utilise network capacity through MVNO agreements.
F22	eSIM capable devices are likely to become more prevalent, with the potential to reduce switching costs for both consumers, MNOs and MVNOs. However, there is the potential for competition to be suppressed if MNOs do not enable eSIMs or lock eSIMs devices to their network.
F23	We may see more infrastructure sharing. Whether this enhances or suppresses competition will depend on how the arrangements are structured. We would expect to see infrastructure sharing proposals that raise potential competition concerns come to us for authorisation.

²⁹⁸ RCG, “Deed of Open Access Undertakings for RBI2”, clause 5.1.

Chapter 7 Regulated services

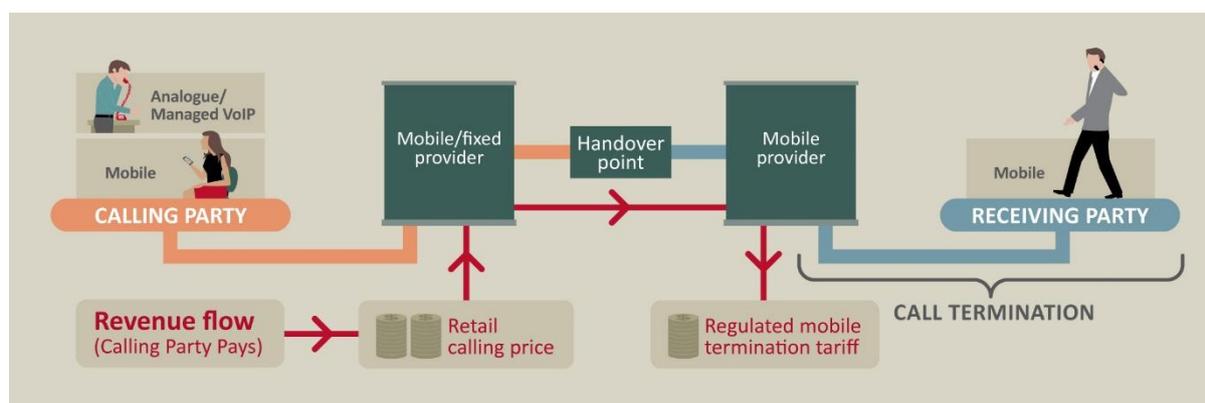
Purpose of this chapter

7.1 This chapter sets out our findings and actions concerning the five regulated services that currently relate to the mobile market, in light of submissions received during the study, the completion of the Schedule 3 reviews of Designated and Specified Services in June 2016, and National Roaming in September 2018.

Mobile termination access services

7.2 MTAS are the termination services a fixed or mobile network operator needs to purchase to allow its subscribers to communicate with the subscribers of a mobile network. The MTAS service is illustrated in Figure 22.

Figure 22 Mobile termination access service



7.3 A mobile network needs to be able to interconnect with other networks to ensure that its subscribers can communicate.

7.4 MTAS is a designated access service under Schedule 1 of the Telecommunications Act, which allows us to determine the price and non-price terms of the service. MTAS includes termination of voice calls and SMS.

7.5 In 2011, we finalised an STD in respect of the MTAS, in which we set mobile termination rates (MTRs) for voice calls and SMS. These are summarised in Table 8.

Table 8 Mobile termination rates

Effective from	6 May 2011	1 Oct 2011	1 Apr 2012	1 Apr 2013	1 Apr 2014
Voice (cpm)	7.48	5.88	3.97	3.72	3.56
SMS (cpSMS)			0.06		

Source: Commerce Commission Decision 724

- 7.6 Every five years, we are required to review whether Schedule 1 services should remain in Schedule 1. The MTAS service was last reviewed in 2015 and we concluded that it should remain in Schedule 1.
- 7.7 Our reasons for keeping MTAS in Schedule 1 included that each MNO has a monopoly over the termination of calls on its network under the calling party pays principle, and that the ability to increase MTRs can distort downstream competition.²⁹⁹ Our next scheduled review of MTAS is September 2020.
- 7.8 Chorus reiterated the points made in its submission on our Terms of Reference for the Mobile Market Study, that the regulated reductions in voice MTRs were set via benchmarking in 2011 and the reductions finished in 2014, and that international evidence indicates that the cost of mobile termination is decreasing.³⁰⁰ Chorus also indicated that it was concerned with above-cost termination rates which it argued leads to “a risk of a wealth transfer from fixed-line only RSPs to RSPs who operate mobile networks”.³⁰¹
- 7.9 Vocus supported the Chorus position in its cross-submission.³⁰² Both parties would like to see a review of MTRs brought forward prior to the scheduled Commission review of MTAS in 2020. Chorus had previously argued that the MTAS rate was high relative to overseas comparators and that it was distortionary, compared with the real costs of servicing mobile calls, particularly fixed-to-mobile calling rates.³⁰³
- 7.10 In several overseas jurisdictions, MTRs are set on a pure long run incremental cost³⁰⁴ pricing principle. Our current pricing principle under Schedule 1 of the Telecommunications Act is total service long run incremental cost, which may result in different pricing calculations.
- 7.11 We note that overseas jurisdictions have significantly lowered their MTRs over the past few years, including comparator countries used to set our benchmark price in our 2011 MTAS STD. For example, Australia was one of the comparators we used

²⁹⁹ Commerce Commission, “Consideration of whether to commence an investigation into whether to omit the Mobile Termination Access Services from Schedule 1 of the Telecommunications Act 2001”, (23 September 2015), para 4.

³⁰⁰ Chorus, “Submission in response to the Commerce Commission’s Mobile Market Study Terms of Reference”, (30 November 2017); Vocus Communications, “Mobile Market Study Scoping”, (30 November 2017).

³⁰¹ Chorus submission on the Preliminary Findings paper, (28 June 2019), p 3.

³⁰² Vocus cross-submission on Preliminary Findings paper, (19 July 2019), para 32.

³⁰³ Chorus submission on the Issues paper, (26 October 2018), p 6.

³⁰⁴ The forward-looking costs incurred over the long-run which are directly attributable to a defined increment of service.

and had a benchmark rate of A5.8 cents per minute.³⁰⁵ However, in 2015 the ACCC set a new TSLRIC-based MTR for voice calls at A1.7 cents per minute.³⁰⁶

- 7.12 We remain committed to first undertake the five-yearly review of MTAS scheduled for 2020, prior to commencing a re-benchmarking of the prices in the MTAS STD. In that review, we intend to consider the competition implications of emerging services such as OTT communication services.
- 7.13 We have previously noted the development and adoption of OTT services utilising Voice-over-Internet Protocol. OTT services can potentially be a substitute for conventional mobile services. OTT services incur no termination charges when both parties have the OTT service on their device.
- 7.14 In our 2015 review of MTAS, we referred to evidence from the European Commission and the ACCC that, although OTT services were emerging as a potential constraint on MTAS, OTT services were not yet effective substitutes.³⁰⁷ We noted that mobile voice traffic in New Zealand continued to increase, although SMS traffic had started to fall in recent years. We concluded that we did not have enough evidence to determine whether OTT services are an effective substitute for mobile services.
- 7.15 Since 2015, mobile voice traffic has continued to increase in New Zealand and SMS traffic has continued to decline. As we noted in our 2017 Annual Monitoring Report, the decline in SMS volumes is expected to continue given the increasing popularity of various OTT messaging services like Facebook Messenger, iMessage, WhatsApp and Viber.³⁰⁸
- 7.16 Analysys Mason’s Connected Consumer Survey reported that 81% of New Zealanders with a smartphone use OTT services, with messaging services being the most common.³⁰⁹

³⁰⁵ Commerce Commission, Decision 724, (5 May 2011), p 71.

³⁰⁶ ACCC, “Mobile Terminating Access Service Final Access Determination: Final Decision”, (August 2015).

³⁰⁷ Commerce Commission, “Consideration of whether to commence an investigation into whether to omit the Mobile Termination Access Services from Schedule 1 of the Telecommunications Act 2001”, (23 September 2015), para 46-49.

³⁰⁸ Commerce Commission, “Annual Telecommunications Monitoring Report: 2017 Key Facts”, (20 December 2017), p 25.

³⁰⁹ Analysys Mason, “Connected Consumer Survey 2018: mobile customer satisfaction in Australia and New Zealand”, (February 2019).

- 7.17 We note that the ACCC has recently decided to retain the MTAS voice termination service as a regulated service, but has deregulated the MTAS SMS termination service, as OTT messaging services are now considered to be effective substitutes for SMS.³¹⁰

National roaming

- 7.18 National roaming allows customers of one mobile network to use another network when they are outside their own service provider's coverage area.
- 7.19 National roaming is a wholesale mobile access service which allows customers on one MNO to roam on the network of another MNO. Roaming is typically used by new entrants or smaller MNOs to offer national coverage in the mobile markets.
- 7.20 When it first entered the mobile market in New Zealand, 2degrees had deployed a mobile network which covered 47% of New Zealand's population. To be able to offer national coverage, 2degrees initially relied on roaming on Vodafone's mobile network, which 2degrees secured through a commercial agreement. 2degrees has since invested in expanding the footprint of its own network, and now has coverage like that of its competitors.
- 7.21 In 2018 we considered the roaming service as part of the five-yearly reviews of services in Schedule 1 of the Telecommunications Act. Our final decision was to retain national roaming as a specified service.
- 7.22 We concluded that there may be potential competition issues arising from the allocation of spectrum for 5G. A new entrant would likely require a roaming arrangement to provide immediate coverage while it built out its physical network.³¹¹
- 7.23 We also noted that the regulated service is specified only, which means that we do not set price terms. This mitigates the risk that roaming will distort investment incentives facing both the MNO relying on roaming and the MNO supplying roaming. However, roaming as a regulated service acts as an important backstop in the event of commercial negotiations failing.

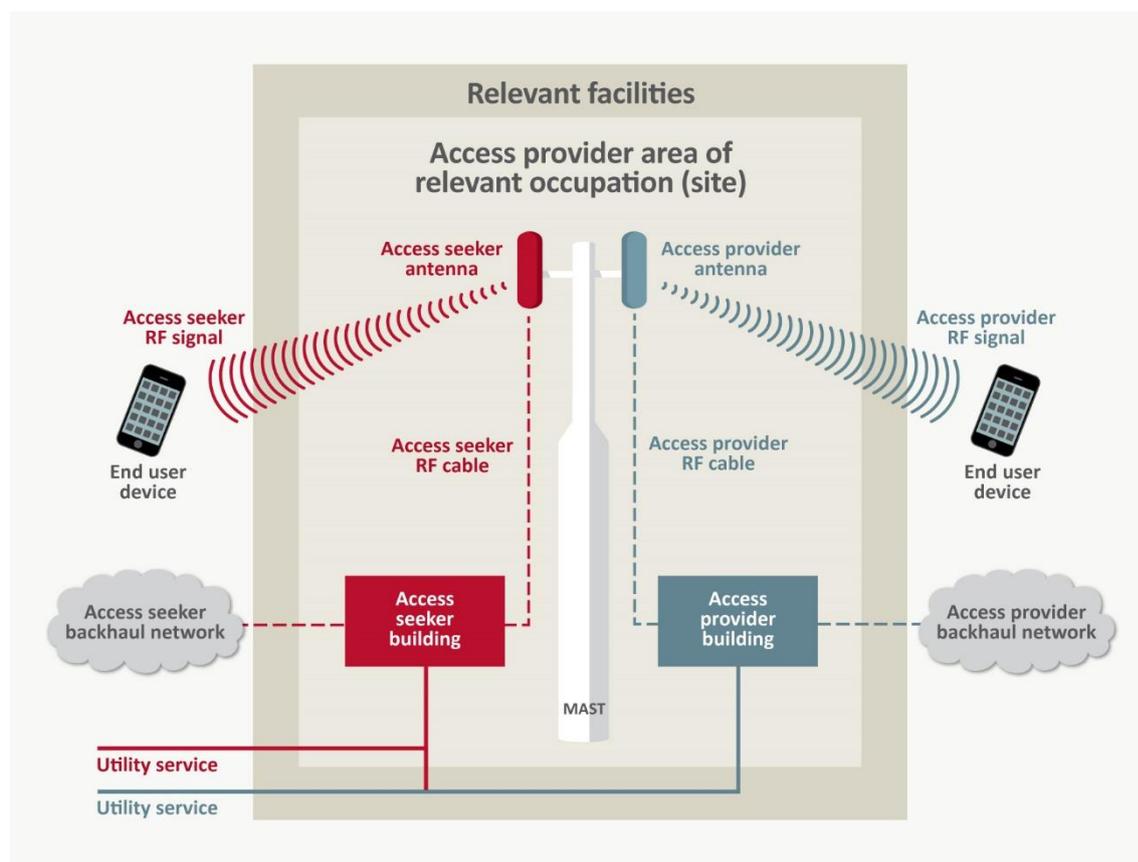
³¹⁰ ACCC, "Domestic Mobile Terminating Access Service Declaration Inquiry: Final Report", (June 2019).

³¹¹ Commerce Commission, "Review of National Roaming: Final decision on consideration of deregulation of national roaming", (4 September 2018), p 7-8.

Mobile co-location

7.24 Mobile co-location is a service that enables an MNO to install mobile network transmission and reception equipment on the mast of another MNO (see Figure 23).

Figure 23 Mobile co-location



7.25 In New Zealand, mobile co-location is a specified service and has been subject to an STD since 2008.³¹² We reviewed whether mobile co-location should remain a specified service in 2016 and concluded that it should remain in Schedule 1.³¹³

7.26 We noted that the ability to co-locate equipment on the infrastructure of another MNO facilitates the efficient deployment of mobile technology by sharing the cost of facilities such as towers and masts. The ability to share such costs is likely to

³¹² Commerce Commission, "Standard Terms Determination for Co-location on Cellular Mobile Transmission Sites, Schedule 1 Mobile Co-location Service Description", (11 December 2008).

³¹³ Commerce Commission, "Review of Designated and Specified Services under Schedule 1 of the Telecommunications Act 2001", (5 July 2016), para 154.

become increasingly important as a mechanism for reaching more remote areas with current and new technology such as 4G LTE and 5G.³¹⁴

- 7.27 We also noted that there had been increased use of co-location, particularly during the period from 2012 to 2015, and that co-location had been occurring both on RBI and non-RBI sites.
- 7.28 Under RBI1, the Government appointed and funded Vodafone to upgrade existing cell sites and build new cell sites in rural areas. Under that arrangement, Vodafone must offer co-location services in respect of cell sites funded through RBI1. MBIE has reported that 154 new cell sites have been built under RBI1, all of which allow for co-location by competing operators. In addition, 387 cell sites have been upgraded.³¹⁵
- 7.29 Co-location on existing cell sites can be more challenging than on new cell sites, as existing cell site infrastructure may have been built to accommodate a single set of equipment. The installation of additional equipment may require strengthening of the mast infrastructure and may also result in the equipment being located further down the mast, leading to reduced coverage.
- 7.30 The second stage of the RBI programme (RBI2) is further extending mobile coverage in rural areas, while the Government’s MBSF is providing greater mobile coverage along state highways and in tourism destinations where no coverage currently exists. MBIE reports that 26 tourist sites have received new mobile coverage, 238km of State Highways have improved coverage, and 25 mobile towers are now complete. Overall, 38,662 rural homes and businesses can now access improved broadband.³¹⁶
- 7.31 The RCG is a joint venture between the three MNOs appointed by the Government to build the infrastructure to extend mobile coverage under the RBI2 and MBSF programmes. This differs from the RBI1 scheme in that under the RCG model, the three MNOs will share radio access network equipment and antennas on each site constructed by the RCG.

³¹⁴ Commerce Commission, “Review of Designated and Specified Services under Schedule 1 of the Telecommunications Act 2001”, (5 July 2016), para X28.1.

³¹⁵ See <https://www.mbie.govt.nz/assets/aae2c79c33/december-18-broadband-quarterly-update.pdf>.

³¹⁶ Crown Infrastructure Partners “Quarterly Connectivity Update Q2 to June 2019” (June 2019), p4.

Number portability

- 7.32 Introduced in 2007, the designated local and mobile number portability service allows customers to keep their number when switching between service providers. We reviewed whether number portability should remain a specified service in 2016 and concluded that it should remain in Schedule 1.³¹⁷
- 7.33 The New Zealand Telecommunications Forum Inc. administers the scheme, and the number portability determination ensures that the process for porting a fixed or mobile telephone number while switching providers is easy to initiate, and that end users are not left without communications for a long period.
- 7.34 We plan to complete our next 5-yearly Schedule 3 review of the service by June 2021.

Backhaul

- 7.35 Backhaul services that support mobile networks are not currently regulated under Schedule 1 of the Telecommunications Act.³¹⁸
- 7.36 MNOs rely on backhaul services to connect cell sites and other network nodes.³¹⁹ Such connectivity supports both mobile services and fixed wireless services and may take the form of actively managed wholesale services (such as leased line bandwidth services), or passive services (such as the direct fibre access service (DFAS)).
- 7.37 We understand that Spark and Vodafone self-supply some of their backhaul requirements, but also acquire backhaul from other parties such as Chorus. In 2017, 2degrees announced that it had selected Chorus as the provider of wholesale backhaul services to support 2degrees' fixed and mobile services.³²⁰
- 7.38 Fibre-based backhaul is the main technology used to support the supply of high speed mobile data services. We expect fibre backhaul to increase in importance

³¹⁷ Commerce Commission, "Review of Designated and Specified Services under Schedule 1 of the Telecommunications Act 2001", (5 July 2016), para 150.

³¹⁸ The backhaul services regulated under Schedule 1 of the Telecommunications Act 2001 are specific to copper regulated access services UCLL, UCLFS and UBA.

³¹⁹ Backhaul in this context refers to a class of services used to transport traffic between active elements (ie, nodes) of a mobile or fixed-line network. Backhaul services may be used anywhere within the mobile or fixed-line operators' network – nationally (eg, Chorus' regional transport service (CRT)), regionally (eg, intra-candidate area backhaul service (ICABS)) and locally (eg, DFAS).

³²⁰ 2degrees media release "2degrees announces Chorus as primary provider of national backhaul" (8 August 2017)

with the deployment of 5G mobile networks because of the need for low latency and high capacity backhaul.

- 7.39 We note that 2degrees expressed some concern over backhaul pricing in Chorus/ Local Fibre Company (LFC) areas, where Chorus and the LFCs are in effect monopoly suppliers of mobile backhaul.³²¹ We also note that Part 6 of the Telecommunications Act provides for the price-quality regulation of DFAS (which may be used as backhaul) for Chorus.
- 7.40 The direct fibre access services that Chorus and the LFCs provide to mobile operators are subject to maximum prices set in 2011 under the terms of the UFB contracts. Those prices will be frozen at the 2019 rates and be subject to annual inflation adjustments from 1 December 2019 and ending on the day before 1 January 2022. Thereafter, LFCs will not be subject to price-quality regulation, but as we note above, Chorus will. We may review the effectiveness of the regulation of backhaul services that are subject to price-quality regulation upon completion of the first regulatory period no later than 31 December 2025.
- 7.41 We indicated in our s9A backhaul study that we will continue to monitor developments in the backhaul sector going forward.³²² Among other reasons, as noted above, fibre-based backhaul will become increasingly important for the successful completion of competing 5G networks.
- 7.42 We note that wireless backhaul may also be an alternative, particularly where fibre is unavailable or impractical. The use of wireless backhaul will be dependent on the availability of appropriate spectrum and local conditions.
- 7.43 The level of competitive intensity in the supply of backhaul services varies around New Zealand. In some regions, there are several competing backhaul networks, such as Chorus, Spark, Vodafone, Vocus, Vector, and the LFCs. In other areas, the options are more limited, and the likely development of small-cell infrastructure to support some 5G use cases could further challenge the competitive dynamic for backhaul services in New Zealand.
- 7.44 As noted above, the MNOs rely on backhaul services from Chorus and the other LFCs to supply mobile and fixed wireless services. To the extent that mobile and fixed wireless services emerge as a competitive threat to fibre-based access services supplied by Chorus and the LFCs, the incentives to supply backhaul services may change.

³²¹ 2degrees submission on the Preliminary Findings paper, (28 June 2019), p 4.

³²² Commerce Commission, "Section 9A Backhaul services study – Our findings", (11 June 2019) p 12-13, p 35.

- 7.45 In effect, Chorus and the LFCs would be supplying an upstream input to competitors in a downstream market. This may become increasingly significant in the context of 5G, as fixed wireless services are expected to be an important early use case supported by 5G deployments.
- 7.46 We also note that some Chorus backhaul products within Chorus' fibre candidate areas (eg, DFAS) are likely to be regulated fibre fixed-line access services under Part 6 of the Telecommunications Act and thus be subject to the maximum allowable revenue set by the new regulatory regime for fibre.³²³
- 7.47 The other LFCs will not be subject to price-quality regulation but will be subject to information disclosure requirements. MBIE has been consulting on the proposed content of regulations to be made under section 226 of the Telecommunications Act that will apply to each regulated fibre service provider.³²⁴
- 7.48 We undertook a section 9A study into backhaul services and released our findings on 11 June 2019.³²⁵ We indicated in those findings that we intend to "continue to monitor the availability and prices of the different commercial backhaul services in Chorus' portfolio on an ongoing basis as part of our section 9A functions".³²⁶ We noted further that we would consider the need for any changes to all regulated backhaul services as part of the scheduled review of certain regulated copper fixed-line services to be completed by no later than 31 December 2025.³²⁷
- 7.49 In conclusion, our analysis of the current state of mobile market competition, likely future developments, and the work we have commissioned by external experts on emerging trends in the mobile market (which has been published separately),³²⁸ confirm our view that the current regulatory settings are fit for purpose. Therefore, our findings on our regulated services are set out below.

³²³ The scope of the FFLAS that are regulated under Part 6 will be set in regulations that are still to be made.

³²⁴ See <https://www.mbie.govt.nz/have-your-say/exposure-draft-of-regulations-section-226-telecommunications-act/>.

³²⁵ Commerce Commission, "Section 9A Backhaul services study – Our findings", (11 June 2019).

³²⁶ Commerce Commission, "Section 9A Backhaul services study – Our findings", (11 June 2019), p 13.

³²⁷ Commerce Commission, "Section 9A Backhaul services study – Our findings", (11 June 2019), p 12.

³²⁸ See https://comcom.govt.nz/data/assets/pdf_file/0033/146679/RDC-Mobile-industry-trends-14-May-2019.PDF.

Findings on regulated services

F24

Our review of the current market conditions, and likely future developments, has not identified sufficient grounds for us to bring forward our planned reviews of regulated services. The scheduled reviews for these services are set out in Table 1 in Chapter 2.

F25

Backhaul services, whether metropolitan or between national network nodes, appear not to have constrained the competitiveness or development of mobile services to date. However, we recognise the potential for bottlenecks to develop as mobile (eg, 5G), fibre technologies (eg, passive optical networking) and fibre regulation undergo a period of significant change.