TELECOMMUNICATIONS ACT 2001:

SCHEDULE 3 INVESTIGATION INTO AMENDING THE ROAMING AND CO-LOCATION SERVICES

Draft Report

3 August 2007

PUBLIC VERSION

COMMERCE COMMISSION

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Report on whether to amend the roaming and co-location services or to accept Vodafone's undertaking

The Commission: Dr Ross Patterson
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Summary of Draft Report: The Commission's recommendation is that co-location should remain a specified service and not to be amended. The Commission recommends that the non-price terms of the national roaming service be amended and that national roaming become a designated service. The Commission recommends benchmarking against mobile termination rates as the Initial Pricing Principle and TSLRIC as the Final Pricing Principle. The Commission recommends that the Vodafone undertaking in its current form should not be accepted

Date of Draft Report: 3 August 2007

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Executive Summary

1. During its investigation into mobile termination rates in 2005, the Commerce Commission ("the Commission") identified several features that suggested a lack of effective competition in the cellular mobile services market, including a highly concentrated market structure, significant barriers to entry, and high pricing in comparison with other OECD countries.

2. On 10 May 2006, the Commission announced that it would examine the reasons for lack of new entry into the cellular mobile services market as a prelude to deciding whether or not to commence an investigation into possible changes to the regulatory framework.

3. On 10 October 2006, following the conclusion of the investigation, the Commission announced that there were reasonable grounds to investigate:[1]

    - amending the non-price terms of the national roaming service;
    - moving the national roaming service from a specified to a designated service; and
    - moving the co-location service from a specified to a designated service.

4. An undertakings regime was incorporated in the Telecommunications Act 2001 ("the Act") via the amendments made on 22 December 2006. This allows a relevant access provider to submit proposed terms and conditions of supply of a service that the Commission is proposing to regulate, as an alternative to regulation.

5. On 19 January 2007, the Commission received an application for an undertaking from Vodafone in relation to the roaming and co-location services, and sought input on the undertaking from interested parties.

6. The Commission received submissions on the undertaking from interested parties on 13 March 2007.

7. On 5 April 2007, the Commission provided Vodafone with its preliminary view of the undertaking and in accordance with clause 16(3) of Schedule 3A of the Act, gave Vodafone an opportunity to amend its undertaking in light of the submissions received. The Commission received an amended undertaking from Vodafone on 22 May 2007.

8. The Commission's preliminary views on the need to amend the specified services of roaming and co-location, and whether to move these services from being

[1] Commerce Commission, *A Review of Cellular Mobile Market Entry Issues*, 10 October 2006

specified services to designated services, as well as on Vodafone's amended undertaking, are set out in this draft report.

9. The Commission considers that the relevant markets for this investigation are:

- the national wholesale markets for roaming services on GSM and CDMA cellular mobile networks respectively;
- the national wholesale market for co-location on cellular transmission sites; and
- the downstream markets in which retail mobile services are supplied.

10. With regard to competition in the markets identified, the Commission considers that:

- there is currently limited competition in the wholesale market for national roaming on both the CDMA and GSM cellular mobile networks. The Commission considers that while entry into the market for roaming on GSM networks is likely to occur, this market is likely to remain subject to limited competition;
- competition for co-location on existing cellular mobile transmission sites is limited; and
- New Zealand's relatively high prices in the retail mobile services market are indicative of lower competitive pressures than in other OECD countries with lower price levels.

11. In considering the impacts on competition from possible regulation of the prices of the roaming and co-location services, the Commission's focus is on the importance of the respective prices for those services in terms of promoting new network-based entry into the retail mobile services market.

12. In terms of the roaming service, consideration is given to a number of factors. The Commission has made a comparison between a counterfactual scenario of no price-regulation and a factual scenario where the price of the service is designated. The Commission has also placed weight on the lack of entry that has occurred in New Zealand. While there may be other factors that have contributed to the lack of a third mobile entrant, the ability of incumbents to set the price of the roaming service, and the relatively high roaming rates offered, are likely to have been significant issues for prospective entrants.

13. The Commission's analysis shows that regulation of the price of the roaming service is likely to have a significant influence on the likelihood of entry, and in particular would enhance the prospects of new entry compared to what would otherwise have occurred in the absence of actual regulation or the threat of regulation.

14. In terms of co-location, the Commission understands that New Zealand Communications and Telecom have reached agreement although technical issues remain to be resolved. The Commission considers that such an agreement may strengthen the incentives for Vodafone to offer co-location on acceptable terms.

15. In making a decision on whether or not to recommend to the Minister to accept Vodafone's amended undertaking, the Commission must make the decision that best gives effect to section 18 of the Act. The Commission must also be satisfied that the undertaking is a suitable alternative to the proposed regulatory change.

16. The Commission has considered the amended undertaking and is not satisfied that the undertaking in its current form is likely to best give effect to section 18 of the Act.

17. In the absence of a satisfactory undertaking from Vodafone, and uncertainty about the terms and conditions on which Telecom will offer roaming, the Commission considers that amending the non-price terms of the roaming service and moving it from a specified to a designated service is likely to best give effect to section 18 of the Act.

18. The Commission recommends that co-location on cellular transmission sites remain a specified service. However, the Commission considers that it is appropriate for changes to be made to the Co-location Code and the Master Co-location Agreement to cater for some currently unresolved issues.

1. Introduction and process

Background

19. The Telecommunications Act 2001 ("the Act") regulates the supply of telecommunications services in New Zealand.[2]

20. In carrying out its functions under the Act, the Commission seeks to promote competition in telecommunications markets for the long-term benefit of end-users of telecommunications services.

21. Schedule 1 of the Act provides for the regulation of certain mobile services, namely cellular number portability, national roaming and co-location on cellular mobile transmission sites.

22. During its investigation into mobile termination rates, the Commission identified several features that suggested a lack of effective competition in the mobile services market[3], including a highly concentrated market structure, significant barriers to entry, and high pricing in comparison with other OECD countries.[4]

23. Further concerns as to barriers to entry were raised during the Commission's investigation into the extension of the period of regulation of various designated and specified services. The Commission received several submissions seeking changes to the specified services of national roaming and cellsite co-location. Respondents submitted that new entrants into the mobile services market face significant barriers to entry and that enhancements to the roaming and co-location services are required to lower those barriers and thereby promote competition in that market.

24. On 10 May 2006, the Commission announced that it would examine the reasons for lack of new entry into the mobile services market as a prelude to deciding whether or not to commence an investigation into possible changes to the regulatory framework.[5]

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[2] Section 5 of the Telecommunications Act 2001 defines telecommunication to mean (a) the conveyance by electromagnetic means from one device to another of any encrypted or non-encrypted sign, signal, impulse, writing, image, sound, instruction, information, or intelligence of any nature, whether for the information of any person using the device or not; but (b) does not include any conveyance that constitutes broadcasting.

[3] For the avoidance of doubt, the mobile services market and the cellular mobile market are used interchangeably throughout this report.

[4] Commerce Commission, Schedule 3 Investigation into Regulation of Mobile Termination, Final Report, 9 June 2005.

[5] Commerce Commission, *Mobile Market Competition Issues,* Letter from Webb (Commission) to Industry

25. The Commission held a series of meetings with parties who have a material interest in the mobile services market, and reviewed the state of competition in that market.

26. On 10 October 2006, the Commission announced that there are reasonable grounds to investigate:[6]

- amending the non-price terms of the national roaming service;
- moving the national roaming service from a specified to a designated service; and
- moving the co-location service from a specified to a designated service.

27. Following the completion of the Commission's review of entry issues in the cellular mobile market, on 16 November 2006 the Commission launched a Schedule 3 investigation into whether or not to amend the terms of the current roaming and co-location services in the Act.

28. On 15 December 2006, the Commission released an Issues Paper[7] seeking input from interested parties on the likely costs and benefits that would result from amending the services.

29. An undertakings regime was incorporated within the Act via the amendments made on 22 December 2006, allowing for a relevant access provider to submit proposed terms and conditions of supply for a service that the Commission is proposing to regulate, as an alternative to regulation.

30. On 19 January 2007, the Commission received an undertaking application from Vodafone, and invited submissions from interested parties on the undertaking.

31. The Commission received submissions on the undertaking from interested parties on 13 March 2007.

32. In accordance with clause 16(3) of Schedule 3A of the Act, on 5 April 2007, the Commission provided Vodafone with its preliminary view of the undertaking application and gave Vodafone an opportunity to amend its undertaking in light of the submissions received.

33. On 22 May 2007, the Commission received an amended undertaking from Vodafone.

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[6] Commerce Commission, *A Review of Cellular Mobile Market Entry Issues*, 10 October 2006
[7] Commerce Commission, *Telecommunications Act 2001: Schedule 3 Investigations into Amendments of the Roaming and Co-location Services, Issues Paper*, 15 December 2006

Commission process and timetable

34. In investigating whether to amend the non-price terms of the national roaming service and whether to move the national roaming service and co-location service from specified services to designated service, the Commission must follow the procedures contained in Part 1 and Part 2 of Schedule 3 of the Act.

35. Part 1 of Schedule 3 of the Act contains the procedure for altering designated services or specified services. Part 2 of Schedule 3 of the Act contains the procedure for specified services to become designated services by adding the specified service to Part 2 of Schedule 1 of the Act (the proposed addition).

36. The Commission supplemented the prescribed procedures by first publishing an Issues Paper in order to identify and obtain feedback on the key issues.

37. The Commission must prepare a draft report which must include the detail of the proposed alteration and proposed addition and must "identify any recommendations that the Commission considers to be sufficiently related to each other that they ought to be considered together".

38. Clause 3(2)(a) of Schedule 3A of the Act provides that if the Commission accepts an undertaking, it may recommend, in its final report to the Minister which is prepared in accordance with clause 4 or clause 11 of Schedule 3 of the Act, that the Minister should accept the undertaking.

39. The Commission must make reasonable efforts to hold a conference or public hearing in relation to the proposed alteration or proposed addition within 10 working days of the closing date for written submissions on the draft report. Following the conference or public hearing, the Commission must deliver a final report to the Minister on the proposed alteration or proposed addition to Schedule 1 of the Act. The Commission must make reasonable efforts to do this within 120 working days of the commencement of the investigation.

40. Given the complexity of the issues under consideration and the decision by the Commission to use the amended Schedule 3 process in the Act after commencing the investigation, the Commission was unable to meet the statutory timeframe in which to deliver a final report to the Minister. The Commission has made reasonable efforts to meet the 120 day timeframe.

41. The Commission is seeking submissions on the draft report. The closing date for written submissions is Friday 31 August 2007.

Public availability of submissions

42. To promote an open and transparent process, the Commission intends to publish as many submissions as possible on its website. Accordingly, the Commission requests that all submissions are provided in electronic form.

Status of information supplied to the Commission

43. On 15 December 2006, the Commission issued a confidentiality order under section 100 of the Commerce Act and section 15(i) of the Act, to apply to information provided by interested parties making submissions in these proceedings. The Order deals with protection of information which is designated as Restricted Information and provides for a procedure by which parties may request additional protection for information. Any persons who wish to receive or provide Restricted Information must sign a deed of undertaking in an appropriate form and in accordance with the Order. The details of the confidentiality order are on the Commission's website at www.comcom.govt.nz.

44. After the expiry of the Commission's confidentiality order, the Commission will follow its usual practices in response to any request for information under the Official Information Act 1982.

Contact details

45. Please contact Tom Forster at thomas.forster@comcom.govt.nz or (04) 924 3742 should you have any questions regarding the process. Please forward all electronic versions of submissions to thomas.forster@comcom.govt.nz.

2. Legal Framework

46. This section sets out the legislative framework for this investigation.

47. On 22 December 2006, the Telecommunications Amendment Act (No 2) 2006 ("the Amendment Act") came into force. The Amendment Act sets up a transitional mechanism for Schedule 3 investigations already commenced but not completed. Under section 66 of the Amendment Act, the Commission had the option to complete the investigation under the old process or under the amended Schedule 3 process.

48. Using the amended Schedule 3 process in the Act, the Commission decided to undertake the investigation into:

- amending the non-price terms of the national roaming service;
- moving the national roaming service from a specified to a designated service; and
- moving the co-location service from a specified to a designated service.

49. Accordingly the Commission may accept an undertaking provided in accordance with Schedule 3A of the Act, as an alternative to the proposed regulatory changes.

Schedule 3

50. Schedule 3 of the Act contains the procedure for altering regulated services. Under Part 1 of Schedule 3, the Commission may undertake an investigation into a proposed alteration and recommend to the Minister of Communications whether or not the proposed alteration should be made.

51. Under Part 2 of Schedule 3, the Commission may investigate whether or not a specified service should become a designated service (the proposed addition) and recommend to the Minister of Communications whether or not the proposed addition should be made.

52. The Commission is required to prepare a draft report, which must include the detail of the proposed alteration[8] or proposed addition[9] and identify any recommendations that the Commission considers to be sufficiently related to each other that they ought to be considered together.

53. The Commission must make reasonable efforts to prepare and deliver a final report to the Minister regarding the proposed alteration or proposed addition no later than 120 working days after the date of giving public notice of the

[8] Clause 2 of Schedule 3
[9] Clause 9 of Schedule 3

investigation[10]. In preparing the final report, the Commission must consider all submissions made on the draft report and all information and opinions presented or expressed at any public hearing on the draft report[11].

54. The Commission's final report for this Schedule 3 investigation must include:

- the detail of the proposed alteration and addition; and
- a recommendation by the Commission as to –
  - whether or not the proposed alteration and addition should be made:
  - whether or not the Minister's decision regarding the proposed alteration or addition should be deferred for any period that the Commission thinks fit; and
- the reasons for the Commission's recommendation; and
- the views of 2 members of the Commission (other than the Telecommunications Commissioner) regarding the recommendation[12].

55. In making its recommendation on the Schedule 3 investigation, the Commission (and the Minister as the case may be) is required under section 19 of the Act to:

(a) consider the purpose set out in section 18; and
(b) if applicable, consider the additional matters set out in Schedule 1 regarding the application of section 18; and
(c) make the recommendation, determination, or decision that the [Commission] or Minister considers best gives, or is likely to best give, effect to the purpose set out in section 18.

56. Section 18 of the Act describes the purpose of Part 2 and Schedules 1 to 3 as follows:

18. **Purpose**—

(1) The purpose of this Part and Schedules 1 to 3 is to promote competition in telecommunications markets for the long-term benefit of end-users of telecommunications services within New Zealand by regulating, and providing for the regulation of, the supply of certain telecommunications services between service providers.
(2) In determining whether or not, or the extent to which, any act or omission will result, or will be likely to result, in competition in telecommunications markets for the long-term benefit of end-users of telecommunications services within New Zealand, the efficiencies that will result, or will be likely to result, from that act or omission must be considered.
(3) Except as otherwise expressly provided, nothing in this Act limits the application of this section
(4) Subsection (3) is for the avoidance of doubt.

57. The Commission is also required to have regard to economic policies of Government when exercising its powers under Schedule 3. Under section 19A, the Commission must have regard to any economic policies of the Government

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[10] Clause 4(1) and clause 11(1) of Schedule 3
[11] Clause 4(2) and 11(2) of Schedule 3.
[12] Clause 4(3) and 11(3) of Schedule 3.

that are transmitted, in writing, to the Commission by the Minister. To date, the Government has not transmitted any economic policies to the Commission under this section.

Schedule 3A

58. The purpose of Schedule 3A of the Act is contained in clause 2 of Schedule 3A:

> The purpose of clauses 3 to 16 is to provide, as an alternative to a proposed regulatory change, a mechanism for an access provider to supply a service to all access seekers -
> (a) on a voluntary basis that avoids the need for regulation; and
> (b) on terms and conditions agreed between the access provider and the Commission.

59. Clause 3(1) of Schedule 3A of the Act provides that:

> While the Commission is considering a proposed regulatory change, the Commission may accept an offer from an access provider to supply a service to all access seekers on the terms and conditions of a written undertaking (an **undertaking**).

60. Clause 3(2) of Schedule 3A of the Act provides that if the Commission accepts the undertaking, the final report (prepared by the Commission in accordance with clause 4 or clause 11 of Schedule 3 of the Act) may include -

> (a) a recommendation by the Commission that the Minister should accept the undertaking; and
> (b) any of the following recommendations by the Commission:
>
> (i) that the proposed regulatory change should be made:
> (ii) that the proposed regulatory change should not be made:
> (iii) that the Minister's decision on the proposed regulatory change should be deferred[13].

61. An undertaking accepted by the Commission has no legal effect unless it is registered under clause 6 of Schedule 3A of the Act[14]. Clause 6 requires the Commission to register the undertaking if the Minister accepts the Commission's recommendation that the Minister should accept an undertaking.

62. Clause 4 of Schedule 3A of the Act provides that the Commission must not make a recommendation in its final report unless the Commission is satisfied that the undertaking -

> (a) complies with this Act and any regulations made under this Act; and
> (b) complies with the standard access principles set out in clause 5 of Schedule 1 and any limits on those standard access principles set out in clause 6 of that schedule.

63. Clause 5 of Schedule 3A of the Act contains the requirements for the undertaking**:**

> (1) An undertaking must—

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13 Clause 3(2) of Schedule 3A.
14 Clause 3(3) of Schedule 3A.

(a) be signed or executed by the relevant access provider; and
(b) specify the terms and conditions of the supply of the service; and
(c) specify the date by which those terms or conditions must be complied with by the relevant access provider; and
(d) specify a mechanism for the resolution by the Commission or a suitably qualified and experienced independent person of any issues or disputes that arise after the undertaking is registered; and
(e) provide for any other prescribed matters.

(2) An undertaking must not be amended after the Commission has made a recommendation under clause 3(2) in respect of that undertaking.

64. Clause 7(1) of Schedule 3A of the Act provides that the registration of an undertaking is effective for a period of 5 years from the date of registration and any further period that the Commission and the relevant access provider may agree. Before agreeing to a further period, the Commission must consult with every person who has a material interest in the matter (clause 7(2)).

65. However, the Commission may make a recommendation in the final report to the Minister that the registration of an undertaking should expire earlier than the five year period in clause 7(1) having regard to the following matters:

(a) the reasonable needs of potential access seekers; and
(b) the commercial lifetime of the service delivery technology concerned; and
(c) any other factors that the Commission thinks relevant[15].

66. Under clause 7(5) of Schedule 3A of the Act, the registration of an undertaking expires on the date that the proposed regulatory change is made.

[15] Clause 7(4).

3. Relevant Markets

67. As set out in its Mergers and Acquisitions Guidelines (MAG),[16] the Commission usually considers markets to have five dimensions. These are:

- the goods or services supplied or purchased (the product dimension);
- the geographic area from which the goods or services are obtained, or within which the goods or services are supplied (the geographic dimension);
- the level in the production or distribution chain (the functional dimension);
- the timeframe or timing within which the market operates, where relevant (the temporal dimension); and
- the different customer types within a market, where relevant (the customer dimension).

68. In the current investigation, the Commission is considering whether to alter existing regulation relating to the roaming and co-location services. Roaming services are acquired by a mobile network operator in order to offer retail mobile services beyond that operator's network reach. Roaming is therefore used as a wholesale input in the provision of retail mobile services.

69. Similarly, co-location is a wholesale service which allows a mobile network operator to share certain existing facilities of an established network, and to reduce the costs of constructing and extending a mobile network.

70. The Commission has therefore considered the markets in which roaming and co-location services are supplied.

Market for National Roaming

71. In Part 3 of Schedule 1 of the Act, the national roaming service is described as:

> A service that enables an end-user who subscribes to a network operator's (**operator A's**) cellular mobile telephone service to use services (except value-added services) generally accepted internationally as second generation cellular mobile services that are provided to the public by another operator (**operator B**), within the area where operator B has a cellular mobile telephone network (which must not be a third generation cellular mobile telephone network), but which is outside the coverage area of operator A's cellular mobile telephone network telephone network

72. National roaming provides the ability for a customer of one cellular mobile network to make and receive calls in areas where the customer's network is inaccessible due to poor coverage or lack of network reach.

[16] Commerce Commission, *Mergers and Acquisitions Guidelines*, page 14.

73. In August 2006, the Commission defined and assessed competition in the markets for roaming and co-location during its investigation into the extension of ten of the thirteen regulated services in the Act.[17]

74. At the time of the Commission's report, national roaming was not currently being provided in the domestic mobile market. National roaming is still not being provided in that market although a National Roaming Pilot Agreement was signed between Vodafone and TelstraClear on 15 March 2007. TelstraClear subsequently decided not to progress with its pilot network build in Tauranga claiming that an eleventh hour change to a key component of its roaming arrangement with Vodafone meant the service would be uncompetitive.[18] Vodafone rejected TelstraClear's accusations and noted that until TelstraClear's withdrawal, Vodafone was working closely with TelstraClear at a technical implementation level to deliver the service[19].

<u>Product Dimension</u>

75. Mobile roaming occurs when customers use their mobile telephone handset on a different mobile network (visited network) from that to which they subscribe (home network). Mobile roaming provides the home network's customers with the ability to automatically use voice call, SMS, data, and other mobile services, when the customers are located or travelling outside the home network's coverage area.

76. There are two main types of mobile roaming services recognised by the mobile telecommunications industry. When the home network's customers are located or travelling in the visited network outside their home country, they use international roaming services. When the visited network is located in the home country, the home network's customers use national roaming services. The Commission's investigation refers to the national roaming service (in-country roaming).

Vodafone's view

77. Vodafone submitted that there is likely to be a single market covering roaming on CDMA and GSM networks.[20] Vodafone argued that at the time of negotiating an initial roaming deal, the entrant is assumed to be technology neutral and may negotiate with either Vodafone or Telecom. Vodafone referred to the experience of Hutchison's entry in Australia, where Hutchison considered bids from both GSM and CDMA providers, and ended up roaming on Telstra's CDMA network.

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[17] Commerce Commission, *Schedule 3 Investigation into the Extension of Regulation of Designated and Specified Services, Final Report,* August 2006.
[18] TelstraClear Media Release, 16 April 2007
[19] Vodafone NZ, Media Release, 16 April 2007
[20] Vodafone NZ, *Submission to the Commerce Commission Issues Paper*, March 2007

78. Vodafone also submitted that in certain areas, roaming and co-location services are likely to be economic substitutes, and that this should be reflected in the Commission's market definition. This is discussed below in relation to the relevant geographic market.

Commission's view

79. The Commission considers that a new entrant would make a technology decision before approaching a potential roaming provider to seek an agreement for roaming. As GSM and CDMA technologies are generally incompatible in terms of roaming, once an entrant has decided to deploy one of these technology types, roaming services provided by the other technology are not a technical substitute.

80. The Commission considers that GSM and CDMA are very different technologies with different cost drivers. Each technology also differs in terms of being able to offer international roaming capability to end-users.[21] A new entrant is likely to take these differences into consideration before deciding on which path to follow. The Commission does not consider that the conclusion of a roaming agreement between an access seeker and an access provider would be the driver of a new entrant's technology choice.

81. In the Commission's view, while there may be some overlap between co-location and roaming services, there are important differences. Roaming provides the entrant with the ability to immediately offer mobile services beyond its initial network reach, and this ability to offer national coverage is an important feature of a mobile service. Co-location relates to the gradual deployment of the entrant's network.

82. In the ACCC investigation into roaming[22], mobile industry players suggested substitutes for roaming included the sharing of poles and towers. However, the ACCC noted that the sharing of poles and towers was unlikely to be an alternative for roaming as the access seeker will still bear much of the cost of network deployment which is unlikely to be attractive in areas of low traffic volume.

83. The Commission maintains the view that there are currently no substitutes available for roaming services in New Zealand and that the market for roaming in New Zealand is made up of two wholesale markets, one for GSM roaming and another for CDMA roaming.

[21] There are more operators utilising GSM technology worldwide and hence more ability to offer internationally roaming for end-users on a GSM network.
[22] ACCC, *Mobile Services Review: Mobile Domestic Inter-carrier Roaming Service, Final report on whether or not the Commission should declare a mobile domestic inter-carrier roaming service*, December 2004

Functional Dimension

84. Roaming involves establishing an agreement between two networks, which allows a home network to offer greater coverage by way of roaming onto a visited network. Roaming is therefore a wholesale input into the provision of downstream retail mobile services. Accordingly, the Commission considers the relevant functional level to be the wholesale level.

Geographic Dimension

85. The current geographic coverage of the two existing mobile networks is national.

86. Telecom has also recently announced that it will be building a nationwide network based around the GSM family of technologies to be launched by the end of 2008.

87. The Commission acknowledges that a new entrant may choose to enter on a regional basis and may not require roaming throughout the whole country. However, it is more likely that a new entrant would prefer to offer coverage to its customers when they move outside the entrant's network footprint.[23]

Vodafone's view

88. In terms of the geographic dimension of the market in which roaming services are supplied, Vodafone submitted that the market is unlikely to be national in scope. According to Vodafone, it will be appropriate to define distinct geographic markets for those areas in which roaming services are likely to be substitutable for network construction (and co-location services), namely in those areas where it is likely to be economically viable for an entrant to build a network. Vodafone argued that in areas where building is not economically viable, roaming and co-location are not substitutes.[24]

89. In a separate submission,[25] Vodafone attempted to identify conditions in which the roaming service and the co-location service may be regarded as being close economic substitutes and hence supplied in the same market. Vodafone submitted that in areas where co-location is available, the ability of the roaming provider to raise prices will be constrained by the cost of building a network in that area using co-location. By comparing the entrant's build costs with the costs of alternatively roaming onto the incumbent's network, Vodafone submitted that an entrant is likely to be indifferent between building its own network in an area and roaming

[23] TelstraClear was planning on entering the market on a sub-regional basis and signed a roaming agreement to that effect with Vodafone. TelstraClear subsequently decided not to proceed with its entry plans claiming that an eleventh hour change to a key component of its roaming arrangement with Vodafone meant the service would be uncompetitive. This accusation was rejected by Vodafone

[24] Vodafone NZ, *Submission to the Commerce Commission Issues Paper*, March 2007

[25] Vodafone NZ, *Market Definitions for Roaming and Colocation Services*, 9 February 2007.

onto the existing incumbent's network, as long as the entrant's market share is equal to the build costs with co-location expressed as a proportion of the standalone build costs. This proportion is estimated by Vodafone to be between 60% and 70%,[26] which, according to Vodafone,

> ... is an ambitious but not impossible target for a second entrant competing with the hypothetical monopolist.

90. To the extent that roaming by the entrant imposes additional costs on the incumbent (for example, by having to add capacity at a site), the co-location option will become more attractive, and hence the point of indifference for the entrant will tend to be lower.

91. Vodafone concluded that building and roaming are substitutes in those areas where network-based entry is feasible, and that the market definition should distinguish between these areas and other areas where roaming is the only viable way in which an entrant could offer coverage.

92. Vodafone noted that the Commission has implicitly recognised the substitution possibilities between building and roaming by its reference to the build or buy decision of an entrant and the suggestion that there may be a connection between the roaming rate and the business case for a new entrant.[27]

93. Vodafone argue that it is only in areas where building is not economically viable that there could be a case for regulating roaming.

Commission's view

94. The Commission acknowledges that there is likely to be some relationship between roaming and co-location in those areas where entry may be feasible. In such cases, there may be some degree of substitutability between the services, whereas in other areas where entry is less likely, the relationship may be more of a complementary nature.

95. However, there are important differences between the two services and their respective roles in an entrant's ability to offer coverage. Roaming provides the entrant with the ability to immediately offer mobile services beyond its initial network reach, and this ability to offer national coverage is generally accepted as being an important feature of a mobile service. Co-location relates to the gradual deployment of the entrant's network. As a result, in the short term, co-location is not likely to be a substitute for roaming, as roaming offers immediate coverage.

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[26] In other words, co-location reduces the overall cost of building a site by between 30% and 40%. Although co-location reduces the cost of shared facilities by 50% in principle, other costs (such as those relating to radio equipment) need to be completely borne by the respective parties. Hence the overall savings from co-location are less than 50%.

[27] Vodafone NZ, *Market Definitions for Roaming and Colocation Services*, 9 February 2007

96. In terms of Vodafone's analysis of the substitutability of co-location and roaming, Vodafone suggests that a market share of 60% to 70% is achievable for an entrant competing with a hypothetical monopolist. At this market share, the entrant would be indifferent between roaming and co-location, and would therefore regard these options as being close substitutes for one another. However, the Commission considers that it is completely unrealistic to believe that an entrant into the New Zealand mobile market, characterised by significant fixed costs, relatively high prices, low usage and two participants with high market shares (46% for Telecom and 54% for Vodafone) could be expected to reach a 60 to 70% market share. A study by the OECD[28] showed that, on average, third entrants in OECD countries reach a market share of around 17%.

97. Vodafone's analysis implies that the market share at which an entrant is indifferent between roaming and building (i.e. at which point roaming and building are close substitutes) will be lower, to the extent that roaming traffic imposes additional costs on the roaming provider. Such additional costs may relate to the need for additional capacity to be installed on the roaming provider's network. However, for plausible values of these additional costs, the entrant's market share would continue to be relatively high.

98. For example, Vodafone's illustration (whereby adding capacity increases the roaming provider's cellsite costs by 20%) indicates that the entrant would have to expect a market share of 50% if they are to be indifferent between roaming and building. A lower market share of, say, 20% would imply that the roaming provider's cellsite costs would increase by a factor of 3 as a result of having to add extra capacity to support roaming.[29] Given that capacity costs only relate to the roaming provider's radio equipment, which in turn is only a proportion of total cellsite costs,[30] this magnitude would be unlikely.

99. The Commission is therefore unconvinced that the results of Vodafone's analysis support the use of a market definition that encompasses both roaming and co-location services.

100. The Commission has previously observed that subscribers would prefer a service that is available nationally.[31] As a result, it will be important for new facilities-based entrants to be able to offer coverage outside their initial network footprint.

[28] OECD Communications Outlook 2007, Table 2.4 Cellular mobile competition in the OECD, 2005, Mobile operator market share according to number of subscribers (%), page 38 (see Table 6, page 47 of this report)

[29] At an entrant market share of 20%, and given Vodafone's 'co-location cost ratio' of 0.6 (i.e. co-location costs are 60% of standalone costs), the incremental cost factor (denoted by Vodafone as λ) would have to be 0.6/0.2, or 3.0.

[30] Other evidence presented to the Commission (including the 3G cost model developed by Covec) suggests that radio equipment represents around 30% of total cellsite costs. This would imply that radio equipment costs would have to increase by in excess of 700% in order for the entrant with a 20% market share to regard roaming and building as close substitutes.

[31] Commerce Commission, *A Review of Cellular Mobile Market Entry Issues*, 10 October 2006

101. The Commission therefore concludes that the market in which roaming services are supplied is a national market.

Customer Dimension

102. Most mobile operators have two categories of customers – pre-paid and post-paid. The Commission considers that it is unnecessary to distinguish between pre-paid and post-paid customers when considering the market for roaming services.

Preliminary view on market for national roaming

103. The market definition approach discussed above is consistent with the view and definition adopted by the Commission in the Schedule 3 Investigation into the extension of regulation of designated and specified services.

104. It is the Commission's preliminary view that the relevant markets for the national roaming service are the national wholesale market for roaming services on GSM cellular mobile networks and the national wholesale market for roaming services on CDMA cellular mobile networks.

Market for Co-location Services

105. In Part 3 of Schedule 1 of the Act, the co-location service is described as:

> A service that enables co-location of cellular mobile telephone network transmission and reception equipment (including any necessary supporting equipment on or with the following facilities (**relevant facilities**)):
>
> (a) any towers, poles, masts, or other similar structures –
>
> (i) that are used for the transmission or reception of telecommunications via a cellular mobile telephone networks; and
> (ii) that are owned, managed or leased by the access provider:
>
> (b) all sites, buildings, or utility services that are associated with the kinds of structures referred to in paragraph (a)

106. Co-location has the ability to reduce the costs associated with the setting up of cell sites and the necessary associated infrastructure of a mobile network operator by the sharing of facilities.

Product Dimension

107. The regulated co-location service is restricted to 'relevant facilities' that are used for the transmission or reception of telecommunications via a cellular mobile

telephone network, and that are owned, managed or leased by the access provider (who must operate a cellular mobile telephone network).[32]

108. For the purposes of defining the product market for co-location, the Commission must consider whether there are any substitutes for co-locating on cellular mobile transmission sites.

Vodafone's view

109. Vodafone argued that roaming and co-location are substitutes and therefore in the same market.[33]

Commission's view

110. The Commission considers that the number of sites available for the co-location of cellular transmission equipment is limited due to the suitability of sites for transmission, planning, resource management, health and environmental considerations and lease terms, which all require additional time and cost for a site to be suitable for cell site location.

111. The Commission considers that there is only limited scope for alternatives to co-location on cellular transmission sites, such as broadcast, high voltage power transmission, and wireless sites.

112. Broadcast transmission equipment is generally located on sites that lend themselves to a high level of geographic coverage transmitting at high power (tens of kilowatts as opposed to tens of watts for cellular sites) in order to achieve optimal population coverage using as few sites as technically possible.

113. Broadcast towers are also tall structures usually on elevated pieces of land to allow the achievement of the widest coverage possible, whereas cellular mobile transmission equipment is usually placed on towers with mast heights of between ten to twenty metres. For these reasons, the Commission considers that the numbers of broadcast sites that can be used for co-locating with cellular transmission sites are limited, and are not substitutes for co-locating with cellular mobile transmission equipment.

114. The Commission considers that high voltage power transmission towers are not suitable alternatives for co-locating with cellular transmission equipment. Most high voltage power transmission towers are located around areas that do not provide the best possible location for cellular transmission equipment especially in terms of traffic volumes to warrant the expense of installing a cell site. The

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[32] Refer to the description of the service above.
[33] Vodafone NZ, *Submission to the Commerce Commission, Market Definitions for Roaming and Co-location Services,* February 2007

Commission considers that this would make high power transmission towers unattractive for co-locating with cellular providers.

115. The Commission understands that wireless networks are deployed in only a few centres around New Zealand. Accordingly, co-locating with wireless networks does not offer a substitute to co-locating on cellular mobile transmission sites due to the minimal coverage of such networks in New Zealand.

116. It is the Commission's view that there are no substitutes for co-locating of cellular transmission equipment. The product market is restricted to co-locating on cellular mobile transmission sites.

Geographic Dimension

117. The structure of demand for co-location is national given that the current geographic coverage of the two existing mobile networks is national. While potential operators may wish to enter the cellular market on a regional basis, absent roaming agreements, the demand for co-location is likely to be on a national basis in order to provide customers with nationwide coverage.

118. The Commission considers that the market for co-location is geographically national.

Preliminary view on market for co-location services

119. It is the Commission's preliminary view that the relevant market for co-location of cellular transmission equipment is the national wholesale market for co-location on cellular transmission sites.

Downstream Markets

120. In terms of assessing any long-term benefit to end-users for the continued regulation of roaming and co-location, it is likely that any such benefit will arise in the downstream markets for retail mobile services. An increase in the number of competitive alternatives at the wholesale level is likely to affect the degree of price competitiveness at the retail level

121. The Commission considers the relevant downstream markets in the case of the current investigation to be the retail mobile services[34] as roaming and co-location services are used as inputs to supply retail mobile services.

[34] These are the retail markets for mobile subscription ,origination and termination

Preliminary view on downstream markets

122. The Commission's preliminary view is that the downstream markets for roaming and co-location services are the markets for the supply of retail mobile services.

4. Competition Assessment

Promotion of Competition

123. In assessing whether or not to recommend amendments to the national roaming and co-location services, the Commission must consider whether each recommendation best gives, or is likely to best give, effect to the promotion of competition in telecommunications markets, consistent with sections 18 and 19 of the Act.

124. The ability of new entry to constrain existing operators in a market is dependent on the barriers to entry or expansion in that market. Where those barriers are low, potential competition may be seen as a real constraint on existing businesses.

125. In assessing the level of competition in the relevant markets, the Commission has had regard to the following factors:

Existing Competition

- the number and relative size of competitors in the market, including where possible an assessment of trends in shares over time;
- the extent to which there is product differentiation;
- the degree to which competitors engage in independent rivalry;
- the degree of vertical integration;
- the absence of barriers to customer switching;
- the movement in prices over time, and any evidence of their broad relationship to underlying costs;
- the existence of any countervailing power;
- the constraints imposed by the regulatory environment; and
- evidence that the access provider is acting inefficiently or achieving excess returns.

Potential Competition

- the potential for entry and the significance of any barriers to entry that may exist, and evidence of recent entry;
- the movement in prices over time, and any evidence of their broad relationship to underlying costs;
- the constraints imposed by the regulatory environment; and
- evidence that the access provider is acting inefficiently or achieving excess returns.

National Roaming

126. In the mobile services market, a new entrant would rely on gaining access to the Vodafone or Telecom network in order to provide nationwide coverage to its customers through roaming. If suppliers of roaming services were to engage in behaviour inconsistent with competitive outcomes, market entry or network deployment by a new entrant would be unlikely to occur.

127. If competition is ineffective in the wholesale market for the provision of roaming services the ability of carriers to compete in the retail mobile services markets will be detrimentally affected.

Existing Competition

128. Vodafone is the only access provider that uses the GSM standard for mobile communications in New Zealand. Likewise Telecom is the only access provider that uses the CDMA standard for mobile communications in New Zealand.

129. The competitiveness of price and non-price terms for roaming would be reduced if the incumbents use their market power when negotiating the terms of roaming agreements.

130. The current regulation of roaming services only relates to non-price terms. The existing suppliers of roaming services face no regulatory constraint in terms of being able to exercise market power through setting prices.

131. Submissions received by the Commission suggest that the roaming rates offered to potential new entrants by incumbents before the advent of the Schedule 3 investigation have been considerably in excess of cost. More recently the roaming rates offered to potential new entrants have declined.[35]

132. It is the Commission's view that neither Vodafone's GSM nor Telecom's CDMA networks face competition for the provision of roaming services on their respective networks.

Potential Competition

133. Telecom has recently announced that it will be deploying technology that uses the GSM standard. Telecom has indicated that it is committed to providing roaming on its network when it becomes operational.[36]

[35] Vodafone in its submission on the Issues Paper, note that the terms proposed in their undertaking (original undertaking) are a reasonable estimate of an average cost-based rate for roaming. However, the rates provided to potential entrants were around [ ]**CRI** higher than the Vodafone original undertaking.
[36] Telecom NZ, Mobile Technology Briefing, 28 June 2007

<u>LET Test</u>

134. In considering the prospects of new entry to act as a constraint on existing competition, the Commission considers the likelihood, extent and timeliness of new entry in response to a rise in price above the competitive level.

135. There is a high likelihood that Telecom will be launching a W-CDMA network. Telecom has announced that it will be investing $300 million over two years to build a network based on the GSM family of technologies.

136. The Commission has been informed by Telecom that the extent of its network will be national comprising of a W-CDMA and a GSM&EDGE networks.[37]

137. In terms of timeliness, Telecom has indicated that its network will be operational by the end of 2008.

138. It therefore appears that Telecom's deployment of a W-CDMA/GSM mobile network would enable it to supply national GSM roaming services. This is likely to represent some constraint on the existing supplier in this market when its network becomes operational.

Commission's preliminary view

139. The Commission's view is that existing competition in the wholesale markets for roaming on CDMA and GSM networks is limited, as there is currently only one supplier in each market. However, with the launch of Telecom's W-CDMA/GSM network, there would be two competing suppliers capable of offering wholesale access to GSM roaming services.

140. The entry of Telecom will increase competition in the GSM roaming market. However, the provision of roaming services would still be highly concentrated, and would still be subject to relatively high barriers to new entry, especially for entrants who do not currently have any existing network infrastructure.

141. The Commission's preliminary view in relation to the national roaming service is that there is currently limited competition in the wholesale market for national roaming on both the CDMA and GSM cellular mobile networks. The Commission considers that while entry into the market for roaming on GSM networks is likely to occur, this market is likely to remain subject to limited competition.

[37] Ibid

Co-location

142. The Commission considers that the co-location of mobile antennae on cellular towers/masts or other similar structures would reduce barriers to entry into the mobile market and lead to the improvement of the competitive conditions in the retail mobile services market.

143. The Commission considers that competition for co-location on existing cellular mobile transmission sites is limited due to the fact that the incumbent operators retain control over the optimal sites for co-location, and have no or limited incentives to support co-location on reasonable terms for competing cellular networks.

144. This constraint is likely to be at its highest in the case of a potential entrant, where the nature and extent of network build is uncertain, rather than in the case of an existing competitor. In the latter case, the reciprocity opportunities for co-location may largely mitigate the market power stemming from control of individual sites.

Commission's preliminary view

145. The Commission has assessed the level of competition in the national market for co-location on cellular mobile transmission sites and considers that this market is subject to limited competition.

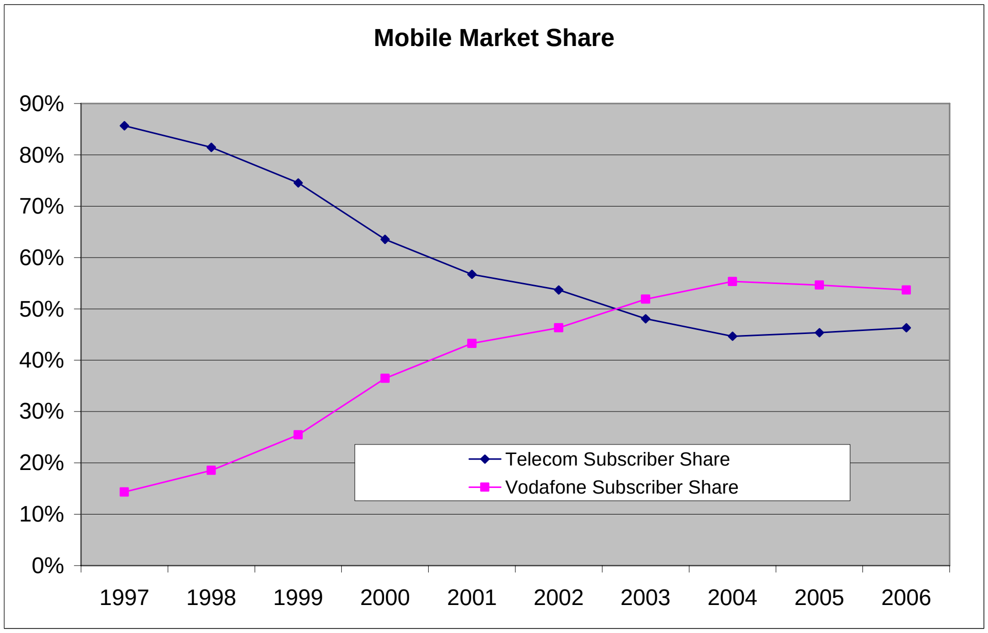
Retail Mobile Services

146. Downstream retail markets are the markets in which any benefit to end-users will emerge. To the extent that there is market power in the roaming and co-location markets (for example in terms of prices in excess of costs), this is likely to flow through to the retail mobile services markets (where prices are also likely to be above cost).

147. There have been significant changes in the subscriber market shares of the two mobile network operators over the last decade as indicated in Figure 1. Vodafone's share of mobile subscribers increased significantly from around 20%[38] in 1998 to exceed 50% by 2003,[39] and is currently estimated to be 53.6%.

[38] Bell South launched its mobile network in New Zealand in 1993. It had achieved a market share of 20% when it sold its network to Vodafone in 1998.

[39] The retail mobile customer base of TelstraClear is not included in the following discussion of market shares.



	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Telecom Subscribers	436150	509375	677000	980000	1298000	1308000	1250000	1352000	1601000	1936000
Vodafone Subscribers	72856	115811	231400	562000	990000	1128000	1349000	1675000	1929000	2244000

Source: Commission estimates based on publicly available data

Figure 1: Mobile Market Shares

148. Compass Communications, Orcon and M2 Communications have signed wholesale agreements with Vodafone to offer retail mobile services. Compass Communications has indicated that its agreement with Vodafone is for a 'thin' mobile virtual network operator (MVNO)[40] while Vodafone describes the agreements as wholesale deals similar to those it had with TelstraClear, rather than MVNOs.[41] TeamTalk has also signed an agreement to resell Vodafone data services.[42]

149. The Commission understands that only TeamTalk has started reselling Vodafone's data services to date.[43] None of the other parties have started wholesaling Vodafone's voice services, although the latest announcements are for the retailing of such services to start in October 2007.

150. An MVNO may put some limited pressure on retail margins, but is not likely to increase competition in the retail mobile services market to the same extent as a new mobile network operator.

[40] The Line – Wednesday 16 August 2006
[41] Computerworld NZ, 21 August 2006, page 4.
[42] TeamTalk media release, 18 September 2006
[43] Email from Ware (TeamTalk) to Forster (Commission), 19 April 2007

151. The Commission notes that the MVNO agreements that have been signed so far appear to be relatively thin, in the sense that the ability of the MVNO to differentiate and offer innovative new retail services is limited. Retail competitors that enter on the basis of resale arrangements are relatively constrained in their ability to engage in independent rivalrous behaviour, especially when compared to facilities-based entry.

152. In a Ministry of Economic Development (MED) report in December 2005, New Zealand's relative cellular pricing performance was ranked in the bottom half of the OECD for pricing. For cellular usage greater than about 30 call minutes per week, New Zealand's relative performance ranking was amongst the poorest in the OECD.[44]

153. More recent OECD data indicates that New Zealand continues to perform unevenly in terms of mobile prices.[45] The Commission notes however, that some of the plans used by the OECD to rank New Zealand which have improved New Zealand's overall ranking have a number of restrictive conditions, including a two year contract term (reduced from three years for the December quarter), heavy early termination penalties, no handset rebate and no international roaming, which is likely to make it unattractive to the vast majority of mobile phone users and indirectly increase the cost to the consumer.[46]

154. New Zealand's performance over time has varied, depending on the level of usage, although the margin by which New Zealand mobile prices exceed the OECD average has narrowed in recent years.

155. Parties have argued in the past that there are cost features of the New Zealand mobile market that contribute to relatively high prices and low usage.[47] The Commission has previously[48] noted that it is unlikely that cost differences between New Zealand and other countries explain New Zealand's relatively high retail prices for mobile services.[49]

156. In a market with significant fixed costs, relatively high prices when compared to other OECD countries and relatively low usage, the prevailing market conditions would be expected to lead to new entry into the market. There has been no new entry in this market. A factor cited by potential entrants has been an inability to

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[44] Ministry of Economic Development, *Benchmarking the Comparative Performance of New Zealand's Telecommunications Regime*, 20 December 2005
[45] Commerce Commission, *Telecommunications Key Statistics*, March Quarter 2007
[46] Ibid
[47] See Commerce Commission, *Schedule 3 Investigation into Regulation of Mobile Termination, Final Report,* 9 June 2005
[48] Ibid
[49] In the mobile termination investigation, the mobile operators submitted that New Zealand usage is significantly lower than the standard 'medium' and 'high' OECD mobile baskets.

conclude roaming and co-location agreements on reasonable terms in a timely manner.

Commission's preliminary view

157. The Commission's preliminary view is that New Zealand's high prices are likely to be indicative of lower competitive pressures than in other OECD countries with lower price levels.

158. Given these conditions in the retail mobile services market, the Commission considers that the regulatory changes under consideration in this investigation are likely to facilitate new network-based entry, and this would likely result in significant benefits to end-users in the form of lower prices and greater service innovation.

5. Impact Analysis of Amendments - Roaming

Introduction

159. In considering whether to recommend amendments to the regulated roaming service, the Commission must make the recommendations that best give, or are likely to best give, effect to the promotion of competition for the long-term benefit of end-users.

160. As a specified service, an access seeker can request that the Commission set the non-price terms of the roaming service, but the price of the service is not subject to regulation. Such a regulatory environment may result in the access provider offering reasonable non-price terms that are consistent with the specified service description, while at the same time imposing a relatively high price for the service. This is exacerbated where there is no competition in supplying the roaming service, such as has been the case in New Zealand.

161. The history of negotiations between access providers and potential entrants in New Zealand appears to be consistent with this. In its submission on the Commission's Issues Paper, New Zealand Communications (formerly Econet) notes that it has been seeking roaming access to Vodafone's network since 2002. According to New Zealand Communications, Vodafone has shown a willingness to negotiate, although the price terms that it has offered for roaming have been excessively high and far above retail levels. New Zealand Communications also note that there are major restraints on the mobile markets in which it can compete. New Zealand Communications submitted that the roaming price offered by Vodafone has only been reduced since the commencement of this Schedule 3 investigation.

162. In considering the impacts on competition from a possible move from specification to designation, the focus of this chapter is therefore on the price at which roaming is made available, rather than the ability to roam *per se*. This includes both the level at which the roaming price is set, as well as the certainty of that price continuing to be made available. This is to assist in determining whether any changes to the current regulated service should include extending regulation to price terms, and whether such changes might facilitate new entry into the mobile services market.

Overview of the Impacts on Competition of Designating the Roaming Service

163. In submissions on the Commission's Issues Paper, parties commented on the kinds of benefits that could be achieved by amending the existing regulated roaming service. For example, TelstraClear submitted that there would be benefits in terms of encouraging new entry if the coverage requirements in the

existing regulated service description were clarified, and that regulated cost-based pricing of the roaming service would facilitate commercial negotiations, and if such negotiations were to fail, a regulatory determination would establish terms of access.

164. New Zealand Communications also submitted that designation would provide a number of benefits, including improved incentives to conclude commercial agreements, the facilitation of infrastructure-based entry, resulting in lower prices, increased usage, improved service quality for end-users, and a more rapid uptake of new technology.

165. According to Vodafone, the main impacts from designating roaming would emerge in the retail mobile market. Vodafone noted that more competition in this market could in theory result in lower prices, higher subscriptions, and greater usage. Vodafone do not consider that designation would have a major impact on competition, as Vodafone considers it likely that there will be two new entrants[50] irrespective of whether roaming prices are regulated. Vodafone however noted that relatively low roaming prices will deter entrants from building.

166. TUANZ also referred to designation providing benefits to end users through greater competition in the provision of mobile services. TUANZ also noted that there would be some regulatory costs incurred by access providers in determining terms of access.

167. In commenting on the nature of benefits that might result from amending the current regulated service, parties have generally referred to the possibility that an enhanced roaming service may facilitate the entry of a new mobile network in New Zealand by reducing the entry barrier represented by the need to offer national coverage. Some of the enhancements proposed by parties relate to price, while others relate to non-price terms such as coverage requirements.

168. In its consideration of the benefits that may arise as a result of designating the roaming service, the Commission has concentrated on the extent to which designation may facilitate new network-based entry. The consequences of new entry are unambiguously pro-competitive, and the Commission has not attempted to quantify these downstream effects. In particular, a key assumption that would be required in order to measure such effects would be the magnitude of any price reductions that result from entry, and the Commission considers that such an assumption would be speculative.

[50] At the time of the Vodafone submission there were two possible entrants. TelstraClear has since decided not to pursue a mobile infrastructure build in New Zealand

Evaluating the Impacts on Competition of Designation

169. An important part of this investigation is an assessment of the impacts on competition that result from the proposed amendment of the regulations that would not otherwise occur. In order to assess those impacts, the Commission makes a comparison between two scenarios: a counterfactual scenario, which represents the Commission's view on what is likely to happen in the absence of the proposed new regulation or amendment of current regulation, and a factual scenario, in which the proposed regulation or amendment is introduced. By considering the differences between the two scenarios, the Commission is looking to establish a nexus between regulation and any resulting impacts on competition, compared to what would otherwise have occurred. In other words, the identified impacts on competition are tied to the proposed regulation.

Counterfactual scenario

170. In considering whether to extend regulation to include the price terms of the roaming and co-location services, one counterfactual scenario could be based on the roaming rates that were being offered prior to the Commission's investigation into whether any regulatory changes were necessary. Such a scenario could be consistent with the view that such rates would have prevailed in a forward-looking counterfactual, absent any regulatory influence on commercial negotiations. To that extent, those rates would more accurately have reflected the underlying negotiating positions of the respective parties, and more specifically, the level of market power held by the provider of roaming services.

171. In terms of considering a roaming price under such a counterfactual, the submission from New Zealand Communications on the Commission's Issues Paper includes a summary of roaming rates offered by Vodafone prior to the Commission's announcement that it had decided to commence a Schedule 3 investigation into roaming and co-location services. New Zealand Communications noted that it had been seeking roaming access on Vodafone's network since 2002. According to New Zealand Communications, while Vodafone had shown a willingness to negotiate, the roaming rates offered by Vodafone were excessive, with rates in excess of [ ]**NZCRI** cpm per leg being offered.[51] New Zealand Communications submitted that such rates were in excess of retail rates, as well as the termination rates that were prevailing at the time.

172. New Zealand Communications also noted that Vodafone provided a new proposal in July 2005, which contained roaming rates of [ ]**NZCRI** cpm per leg.

[51] New Zealand Communications refer to per-leg roaming rates offered by Vodafone of [ ]**NZCRI**

173. The Commission is aware that TelstraClear was offered [ ]**TCLRI** cents for roaming in the concluded national roaming agreement signed between TelstraClear and Vodafone in July 2005.[52]

174. However, the Commission is also aware that Vodafone and TelstraClear reached an updated agreement in early 2007, which included the provision of roaming at a rate of [ ]**TCLRI**. This agreement was reached against a backdrop of this investigation and possible changes to the regulation of roaming services. It nevertheless represent the roaming rate that would likely prevail if no regulatory changes are made to the roaming service. While that agreement was not implemented, it is likely that similar terms would have been offered to any entrant seeking roaming access to Vodafone's network, given the regulatory backdrop at the time.

175. The Commission considers there to be good reasons to consider a counterfactual scenario within the above bounds. There is evidence of a commercially agreed roaming rate of [ ]**TCLRI**, and the Commission considers it appropriate to place some weight on this. However, if the threat of regulation had not been present (or were to be removed), it is conceivable that the commercial terms offered by Vodafone would be higher than this rate, in particular given the lack of competitive pressure faced by Vodafone in offering GSM roaming.[53]

176. The upper bound of [ ]**NZCRI** reflects the offer that was prevailing at the time of the Commission's announcement to consider extending regulation to the price terms of the roaming service. However, the roaming rates being offered by Vodafone appear to have reduced over time, and it is possible that further reductions might have been made even had the Commission not commenced its current investigation.

177. In the following analysis, the Commission has therefore compared regulation against a counterfactual scenario that is bounded by the above roaming rates.

178. While it could be argued that the undertakings put forward by Vodafone should form the basis of what would occur in the absence of price-regulation, the Commission considers that the primary question is whether regulation should be extended to the price of the services, and then if so, what form should that regulation take. Options for the latter include the Commission determining the regulated price of the service (designation), or alternatively the Commission accepting an appropriate undertaking put forward by an access provider.

179. For the purposes of considering whether to extend regulation to the price terms of the roaming service, the Commission has adopted a counterfactual roaming rate that is bounded by [ ]**CRI** per leg and [ ]**CRI** per leg.

[52] Information obtained from the section 98 Notices sent out to TelstraClear in April 2007.
[53] Telecom's recent announcement of its plans to build a GSM/WCDMA network may have had some effect on Vodafone's commercial terms for roaming.

Factual scenario

180. In terms of a factual scenario, the Commission's Issues Paper raised the possibility of designation, where the regulated roaming price is based on the estimated costs of providing roaming services, as proxied by a cost-based mobile termination rate (MTR).[54] The provision of a roaming service involves the origination of a mobile call on the access provider's network, and may also (though not necessarily) involve the termination of the call on the access provider's network. To the extent that call origination and termination on a mobile network are similar, MTRs are likely to be a useful proxy for each leg of a roamed call.[55]

181. In its submission on the Commission's Issues Paper, TelstraClear agreed that cost-based MTRs may represent an appropriate proxy for per-leg roaming. New Zealand Communications also submitted that termination of calls on a mobile network and roaming involve similar network elements, and that cost-based MTRs would be a strong proxy for setting an initial cost-based roaming rate.

182. Vodafone noted that there are similarities between roaming and call origination/ termination, although Vodafone indicated that roaming costs are likely to be somewhat higher.

183. Telecom submitted that cost-based MTRs are based on average costs across a mobile network, whereas roaming generally relates to the use of higher cost parts of a mobile network. Telecom submitted that it would be inappropriate to use cost-based MTRs as a proxy for the costs of providing roaming services.

184. The Commission has previously estimated a cost-based MTR to be 15 cpm, declining over time. The Commission referred to a number of reasons why the cost of mobile termination might decline over time, such as increasing demand for termination services (as traffic volumes increase), as well as migration of traffic onto lower cost 3G platforms.

185. Since the Commission undertook its benchmarking of cost-based MTRs, a number of those benchmarks have been reduced, including in Australia and the United Kingdom. In June 2007, the ACCC announced that the MTR in Australia would be reduced from A$0.12 (NZ$0.1395) per minute to A$0.09 (NZ$0.1046) per minute, taking effect from 1 July 2007.[56] The previous rate had been based on benchmarking and other data, whereas the new rate was based on a cost model.

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[54] Issues Paper, 15 December 2006, paragraph 54.
[55] The European Regulators Group (ERG) has proposed that MTRs be used as a proxy for international roaming (on a per-leg basis). ERG, 22 March 2006, page 9.
[56] ACCC, MTAS Pricing Principles Determination 1 July 2007 to 31 December 2008, June 2007.

Ofcom reduced the rates for mobile termination in the UK in March 2007, from £0.0563 (NZ$0.1661) per minute to £0.051 (NZ$0.1505) per minute.[57]

186. If the Commission were to set a cost-based roaming rate on the basis of mobile termination cost benchmarks, it will be appropriate to take these changes into account. For the purposes of this draft report, the Commission has reduced its estimated cost for mobile termination rates to 14 cpm. The Commission notes that this rate is consistent with the average 'headline' roaming rate contained in Vodafone's amended undertaking.

187. In terms of Telecom's argument that roaming typically relates to the use of parts of a mobile network exhibiting relatively high costs, the Commission does give some consideration to this issue when discussing Vodafone's amended undertaking. The Commission considers that there may be some merit in some form of de-averaging of roaming rates in order to better reflect variations in the cost of providing the service in different areas. However, the counterfactual being considered here relates to offers by Vodafone of average roaming rates, and an averaged regulated roaming rate is also used. To the extent that there are efficiency gains from using a de-averaged roaming rate under the factual, these would represent additional benefits compared to the counterfactual.

Comparing the counterfactual and factual

188. In terms of the roaming service, counterfactual roaming rates of [ ]**CRI** and [ ]**CRI** are compared with a cost-based estimate of 14 cpm for the purposes of this investigation.

189. Submissions on the Issues Paper indicated that the benefits and costs of regulating roaming and co-location should be assessed in qualitative terms, and where possible, using quantitative analyses.

190. In terms of the latter, Vodafone has submitted a model developed by Covec which provides some quantitative analysis of the impact of roaming rates in terms of facilitating new network-based entry into the provision of retail mobile services. Specifically, the model considers the extent to which the level of the roaming price affects the entrant's break-even market share. In principle, such a model may assist in determining whether a lower roaming rate would materially enhance the likelihood of new network-based entry into the retail mobile services market.

191. Vodafone has provided a copy of the Covec model to New Zealand Communications, with the confidential material removed. Having reviewed the Covec model, New Zealand Communications has provided the Commission with a number of comments on the model, along with a copy of the model using New Zealand Communications' costs and other assumptions.

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[57] Ofcom, Mobile call termination statement, 27 March 2007.

192. As the Commission has noted in previous investigations, the Commission considers that quantitative modeling is useful to the degree that it focuses on key assumptions regarding characteristics of the market and the way in which participants are likely to act, with and without regulation. In the current investigation, a model has been submitted for the Commission's consideration, which looks at the impact of the roaming price on the business case for a new entrant. The Commission does not consider that any model supplants the Commission's exercise of judgment, but rather may provide support to the Commission's decisions by:

- making transparent the values of key parameters and assumptions in the analysis; and
- producing some quantitative guidance on the impact of the roaming price on entry.

193. In considering the case for extending regulation to the price terms of the roaming service, the Commission has considered the quantitative information submitted by both Covec and New Zealand Communications. Some caution needs to be exercised in placing undue weight on quantitative analyses of this nature. In particular, the usefulness of such a model will depend on whether its results are consistent with actual behaviour, for example in terms of predicting whether entry will actually occur.

194. As discussed below, the Commission considers that there are a number of limitations of the Covec model, both in terms of the underlying assumptions of the model, and in terms of what the model was designed to do. The Commission has made a number of amendments to the Covec model to better reflect the nature of entry and current market conditions. This amended model is then used to evaluate the roaming rates under the counterfactual and factual, and their implications for possible new entry.

Summary of the Covec model

195. The Covec model is based on the estimated costs that would be incurred by an entrant deploying a 3G mobile network in New Zealand. These include annualised capital costs[58] and operating costs (including various overheads). Given these estimated costs, as well as various scenarios relating to the entrant's likely revenues, the model calculates the level of market share that the entrant would need to achieve by the end of five years, in order to break even. The break-even market share is recalculated for various combinations of post-entry revenues (as proxied by ARPU) and roaming rates.

196. Table 1 summarises the relevant results of the Covec model, if the entrant is assumed to build out coverage to the three main centres, which is the level of

[58] Based on a cost of capital of 15%.

initial coverage planned by New Zealand Communications. These results are generated using the counterfactual and factual roaming rates discussed above.

Table 1: Covec Base Case results (three-city coverage)

ARPU reduction	Roaming rate (cpm)		
	Factual	Counterfactual	
	14.0	[ ]**CRI**	[ ]**CRI**
0%	12%	14%	17%
5%	14%	16%	20%
10%	16%	18%	24%
15%	18%	22%	30%
20%	21%	26%	36%
25%	25%	32%	45%

Source: Covec 3G model, 'Control' sheet. The table presents the results of the Covec model, given the roaming rates in the Commission's counterfactual and factual scenarios.

197. For example, at a 10% ARPU reduction, Covec estimate that an entrant facing a roaming rate of 14 cpm would need to achieve a market share of 16% by the end of five years, in order to cover its costs. If the roaming rate had been [ ]**CRI**, the entrant's costs would be higher, and its break-even market share would be 18% by the end of five years, and 24% if the roaming rate were [ ]**CRI**.

198. The model's results are sensitive to a number of parameters. However, a basic relationship in the model is the estimated roaming costs as a proportion of the entrant's total costs. If roaming costs are relatively high (or conversely, non-roaming costs are relatively low), then changes in the roaming rate will have a more pronounced effect on the entrant's business case. According to Vodafone, the lack of sensitivity of the entrant's break-even market share to the roaming rate suggests that the level of the roaming rate is not a significant component of the entrant's business case.

199. However, the Commission notes that even on the Covec assumptions, the prospects for a new entrant in terms of being able to cover its costs do differ between the counterfactual and the factual scenarios. Although the variation in the entrant's break-even market share is less than the variation in the roaming rate, the threshold for the entrant to be financially viable is considerably higher at a roaming rate of [ ]**CRI**. Specifically, the break-even market share given such a roaming rate is between 44% and 78% higher than it is under the factual, depending on the assumptions made about the revenues earned by the entrant (when faced with a lower counterfactual roaming rate of [ ]**CRI** the required market shares for the entrant to be viable are 14%-27% higher than under the factual).

200. This sensitivity of the entrant to the roaming rate increases for lower levels of coverage. An entrant with a smaller footprint will tend to be more reliant on roaming and more exposed to excessive roaming rates, as more of its customers could be expected to require services beyond its relatively limited network reach. For example, for an entrant that only covers Auckland, the Covec model predicts that the break-even market shares under the counterfactual of [ ]**CRI** will be between 82% and 140% higher than under the factual.

201. The Commission therefore considers that even based on the Covec assumptions, the results from the Covec model shows an entry threshold that is noticeably higher under the counterfactual scenario than it would be under the factual.[59]

202. The Covec model is based on a large number of assumptions and cost data, much of which is sourced from Vodafone and is based on Vodafone's experience in building a mobile network. To the extent that an entrant incurs different costs, builds coverage in a different manner or at a different rate, or has a profile of customers with different characteristics from those of Vodafone, the Covec model will be of more limited value in terms of demonstrating the impact of roaming rates on the entrant's business case.

203. It is also important to note that the Covec model was designed to consider the impact of roaming rates on the relative viability of new entry, but says little about the likelihood that entry will actually occur, nor does it reveal anything on the likely impact of such entry on prices paid by end-users. In other words, it focuses on the differences in break-even market shares, given different roaming rates, but doesn't by itself inform whether a particular market share is achievable. In order to provide some guidance on this, information from outside the model is required. In this regard, the Commission has given some consideration to the level of market share achieved by entrants in overseas markets, within a comparable timeframe.

204. The Commission has reviewed the Covec model and the various assumptions underlying the Covec results. The main assumptions that the Commission considers questionable are outlined and discussed in the following section. The Commission has amended a number of the model's inputs to better reflect the entry plans of New Zealand Communications and the likely market conditions that New Zealand Communications would face, should it decide to enter. As a result, in the Commission's view, the amended model will be more informative as to the significance of roaming rates for an entrant into the New Zealand mobile market.

205. In summary, several factors have been identified that suggest that the Covec model may overstate a number of non-roaming costs of an entrant, and in doing so, understate the significance of roaming. These relate to the mix of spectrum

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[59] However, as discussed below, there are a number of reasons why the Covec assumptions are likely to understate the significance of roaming costs for an entrant.

used by the entrant in the Covec model, and the assumptions made about the size of the mobile market, the volume of minutes per subscriber, the level of revenues earned by the entrant, and the level of interconnection costs.

206. The spectrum mix is important, as it determines the amount of coverage available from any one cellsite, and hence will influence the number of cellsites (and hence the associated level of capital expenditure) required to establish a certain level of coverage. The size of the mobile market, traffic volumes and interconnection costs are important, as these parameters influence the level of traffic-sensitive costs of the entrant.

207. The amendments made to the Covec model are discussed below.

Mix of spectrum

208. The Covec model assumes that the entrant will use 2100 MHz spectrum to deploy a 3G mobile network, and that the entrant's deployment of 3G cellsites will follow that of Vodafone.

209. However, New Zealand Communications has noted that its entry plans are based on a combination of 2100 MHz spectrum and 900 MHz spectrum, and that this in fact improves its entry business case, compared to the kind of entry modelled by Covec, as the use of 900 MHz spectrum results in significantly fewer cellsites having to be built. For example, in populating the Covec model with its own data, New Zealand Communications has assumed that it will require [ ]**NZCRI** cellsites in total. Of these, [ ]**NZCRI** sites will cover the five main centres, compared to a Covec estimate of 623 sites.

210. The Commission agrees with New Zealand Communications that the use of 900 MHz spectrum will reduce the costs of deploying a network. For example, according to NokiaSiemens, who have been selected by Vodafone New Zealand to build a 3G W-CDMA network operating at 900 MHz, Vodafone will be able to significantly reduce deployment costs, especially in rural areas, by building less than half of the number of base stations that would be associated with a 2100 MHz deployment.[60]

211. As noted by New Zealand Communications, this will tend to improve the case for entry, relative to the sole use of 2100 MHz spectrum. Although the use of 900 MHz spectrum may be best suited for deployment in rural areas in particular, New Zealand Communications' plans appear to involve fewer cellsites in the five main population centres than the number estimated by Covec. By reducing the capital costs associated with cellsites, it will also tend to increase the relative significance of roaming costs.

[60] exchange, "NokiaSiemens to build 900MHz WCDMA net for Vodafone NZ", 15 June 2007

212. The Commission has therefore used New Zealand Communications' planned distribution of cellsites, in place of Covec's assumption that the entrant's deployment of 3G cellsites will follow that of Vodafone. In effect, this results in a reduction in cellsite capital expenditure[61] and lowers the entrant's overall costs.

Market size (subscribers and volumes of minutes)

213. Covec also make a number of assumptions relating to the size of the market. In terms of the number of subscribers, Covec use a figure of 3.8 million subscribers in the first year of entry, and allow this to increase by 2% per year. In addition, each subscriber is assumed to originate 1,050 call minutes each year, and this volume is held constant over time.

214. The above parameters are used to generate a total traffic volume for the entrant – by year five, Covec estimate the entrant will carry 648 million minutes – and some proportion of this traffic will be roamed. The smaller this volume, the smaller will be the entrant's roaming costs, and the sensitivity of the entrant's overall costs (and hence business case) to changes in the roaming rate will be reduced.

215. However, these parameters used by Covec appear to be relatively low. For example, there are currently 4.18 million mobile subscribers in New Zealand.[62] This is approximately 10% higher than the Covec assumption. The Commission has updated the starting market size to 4.18 million subscribers.

216. The model's assumptions surrounding traffic volumes originated by the entrant subscribers also appear to produce a relatively low volume of minutes per subscriber. Covec assume that each subscriber will originate 1,050 minutes per annum, with this volume remaining constant over five years.

217. However, according to Vodafone's published data, the average volume of minutes per subscriber on its network is higher than the figure of 1,050 minutes used by Covec. Quarterly data indicates that Vodafone carried 2,468 million minutes throughout 2006 on its network, while the average end-of-quarter number of Vodafone mobile subscribers was 2.12 million in 2006. The average volume of minutes per Vodafone subscriber in 2006 was therefore around 1,160 minutes.

218. It is also likely that this figure could understate the average volumes *per entrant subscriber*, which is the relevant figure for the model. For the entrant to be able to churn customers away from existing mobile operators, the entrant is likely to have to offer prices that are more attractive than those offered by the incumbents.

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[61] The Covec model estimates that using 2100MHz spectrum, an entrant covering the five main cities would require 623 cellsites and incur total cellsite capital costs of $110 million. Using the New Zealand Communications deployment, only [ ]**NZCRI** cellsites are required to cover the five main cities, and the Commission estimates that the corresponding total cellsite capital costs would be [ ]**CRI**.

[62] Commission estimates based on publicly available data (reports from Telecom and Vodafone)

Given some elasticity effect, a lower calling price would be expected to result in higher volumes for the entrant. On the other hand, this could be offset to the extent that the entrant attracted a higher proportion of prepaid customers, who typically make a relatively low volume of calls.

219. The Covec assumption of a constant volume of minutes per subscriber over the five years could also be questioned, in particular as the market reaches high levels of penetration and mobile operators turn to ways of increasing usage by existing subscribers. That could result in increasing levels of usage per subscriber. For example, Vodafone has stated that its long-term strategy is to reduce prices[63] and increase usage on its network.

220. New Zealand Communications has also questioned the assumption of constant volumes, and suggested that annual growth of 5% would be appropriate. New Zealand Communications refer to Vodafone data on minutes of use per customer, showing annual growth of just over 7% over 2004-2007.

221. The Commission has assumed that the annual volume of minutes per entrant subscriber is 1,160 minutes, with this increasing by 5% per annum.[64]

Average revenues

222. Covec assume that the average level of revenue earned from supplying services to each mobile subscriber is $560 per annum. This appears to be based on Vodafone's average revenue per user (ARPU), which was reported by Vodafone as being $46.60 per month (which equates to $559.20 per annum) in mid 2006.

223. However, an entrant is likely to be competing for retail subscribers not only with Vodafone, but also with Telecom. In considering the level of revenues at the point of entry, it is therefore likely to be more appropriate to take Telecom's revenues per user into account, as well as those of Vodafone. Based on reported ARPUs for Telecom and Vodafone as of March 2007, the average level of ARPU (weighted by retail market share) is $500 per annum. The Commission considers this to be a more realistic measure of revenues currently available.

Other traffic-sensitive costs

224. According to Covec, the large majority of an entrant's costs are likely to be in the form of interconnection and other operating costs. Covec estimate that in excess

[63] In a media release on 10 October 2006, Vodafone indicated that they are committed to putting New Zealand in the top half of the OECD by 2010.
[64] As a result of the higher number of subscribers and minutes per subscriber, the estimated volume of traffic on the entrant's network (by year five) increases from 648 million minutes (under the Covec assumptions), to 957 million minutes. This figure would be higher still, if an elasticity effect were introduced for the entrant's volumes. Other things being equal, this will tend to increase the sensitivity of the entrant's costs to changes in the roaming rate.

of 70% of the entrant's annual costs relate to interconnection and other forms of operating costs (such as roaming, content, and IT operating costs).

225. The Commission notes that Covec has used a mobile-to-mobile interconnection rate of 20 cpm. This is the cost paid by the entrant when its subscribers make calls to subscribers on another mobile network. Such interconnection costs are one of the single major cost lines in the Covec model.

226. Mobile termination rates in New Zealand are currently set in accordance with commercial offers made by Telecom and Vodafone to the Minister of Communications. According to these offers, which were accepted by the Minister, the current maximum termination rate is 17 cpm, and this rate reduces over each of the next four years, as summarised in Table 2.

Table 2: Mobile Termination Rates (cpm)

	Vodafone	**Telecom**
to 31 March 2008	17.0	17.0
1 April 2008 to 31 March 2009	16.0	16.0
1 April 2009 to 31 March 2010	15.0	15.0
1 April 2010 to 31 March 2011	14.4	14.0
1 April 2011 to 31 March 2012	14.0	12.0

227. The average mobile termination rate over the period is 15 cpm. The Commission considers that this is a better estimate of the average mobile interconnection rate that any entrant mobile network would face over the next five years.

Summary of amendments to Covec model

228. Having reviewed the Covec model, and considered New Zealand Communications' response to that model, the Commission has made a number of amendments to the assumptions underlying that model. These include incorporation of New Zealand Communications' planned deployment of 2100 MHz and 900 MHz spectrum, and updating a number of parameters relating to market size, traffic volumes, revenues, and interconnection parameters.

229. The amended Covec model is used to compare the roaming rates under the counterfactual of no designation, and the factual of designation. The results of the amended Covec model are discussed later in this section.

Limitations of the Covec model

230. In addition to the assumptions underlying the Covec model, it is important to repeat the limitations of the Covec model in terms of what it is designed to do. In considering the matrix of break-even market shares generated by the model, particular consideration has to be given to the level of ARPU reductions that are expected following entry, as this parameter has a significant influence on the estimated viability of the entrant. As shown in Table 1, Covec estimate that an entrant facing existing ARPU (i.e. 0% reduction) and a roaming rate of 14 cpm would have to capture 12% of subscribers within five years in order to cover its costs, while the same entrant facing a 25% ARPU reduction would have to achieve a 25% market share.

231. Expectations regarding the level of ARPU reduction following entry therefore need to be formed exogenously, for example by considering experience in other jurisdictions where entry has occurred, or by considering levels built into the business plans of likely entrants to the extent that these are available.

232. The Commission has not formed a specific view on the likely reduction in prices as a result of any new entry.[65] However, in considering the results of the Covec model, the Commission has focused on the market shares for ARPU reductions of up to 10%, although the conclusions drawn generally hold across all ranges of ARPU reductions. It seems reasonable to expect the entrant to have to offer some inducement to encourage existing mobile subscribers to switch.

233. The Commission notes that a 10% reduction in ARPU is not the same as a 10% reduction in price. ARPU is a measure of revenue, and as such includes a pricing and volume component. A reduction in price will increase the volume of services, and so the resulting change in ARPU is likely to be less than the price reduction. Other things being equal, a 10% ARPU reduction will therefore imply a greater reduction in prices.

234. The Covec model also says nothing about the likelihood that a particular market share could be achieved within the five year period. For example, if a 10% ARPU reduction is expected, then at a roaming rate of 14 cpm, the Covec model predicts that an entrant would have to reach a market share of 16% in five years. The model is silent on whether such a market share target is likely or not.

235. Some guidance on the likelihood of entry may be available from the experience of third entrants in overseas markets, although the Commission notes that such entry typically occurred at lower levels of mobile penetration. Given the relatively high levels of penetration in New Zealand, entry may be more difficult.

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[65] As noted elsewhere in this draft, the Commission considers that such a view would be highly speculative.

Roaming rates and the impact on new entry

236. As noted earlier, a cost-based roaming rate under the factual is assumed to be 14 cpm. This is the cost-based rate that would be used for each leg of a roamed call.[66]

237. A counterfactual roaming rate of between [ ]**CRI** cpm and [ ]**CRI** cpm is used.

238. Given the amendments discussed above, the model estimates the following break-even market shares for an entrant with coverage in the three main population centres, as per the initial plans of New Zealand Communications.

Table 3: Amended Covec model: Results for Entry in Auckland, Wellington, Christchurch

ARPU reduction	**Roaming rate (cpm)**		
	Factual	Counterfactual	
	14.0	[ ]**CRI**	[ ]**CRI**
0%	14%	18%	31%
5%	16%	22%	39%
10%	19%	28%	48%
15%	24%	35%	60%
20%	30%	45%	73%
25%	38%	56%	87%

239. The results of the amended model show that a viable entrant would have to achieve a market share of 48%, given a roaming rate of [ ]**CRI** cpm and an ARPU reduction of 10%. If the counterfactual roaming rate were [ ]**CRI** cpm, the entrant's costs would be lower, and the break-even market share is estimated to be 28%. Faced with a roaming rate subject to regulation, the entrant's required market share would fall to 19%.

240. For the ARPU reductions shown in Table 3, the market shares thresholds for viable entry under the [ ]**CRI** cpm counterfactual are more than double the required market shares with regulated roaming rates. Even under the lower [ ]**CRI** cpm counterfactual, the break-even market shares exceed those where the roaming price is subject to regulation, by in excess of one-third.

241. Two observations are worth noting in comparing the results of the amended model with those estimated by Covec. First, the break-even shares under the amended model tend to be higher than those estimated by Covec, for the same levels of coverage. In this regard, the changes made by the Commission to the

[66] For example, if the entrant's subscriber makes a call while roaming, and the called party is a subscriber to the entrant's network and is also roaming, the call would involve two roaming legs and would consequently involve a roaming charge of 30 cpm.

Covec assumptions produce two opposing effects. On the one hand, the use of a mix of 900 MHz and 2100 MHz spectrum reduces the capital expenditure involved in deploying cellsites, which lowers the break-even market shares. However, a number of operating costs in the model are traffic-sensitive (such as interconnection and roaming costs), and as noted earlier, the Commission considers that the Covec assumptions are likely to understate traffic volumes originated by the entrant's subscribers. The higher traffic volumes increase these costs, such that under the amended model, the estimated break-even market shares are higher than when the Covec assumptions are used. This effect is reinforced by the use of a lower revenue assumption, which means that a higher market share is required to cover a given level of costs.

242. The second point is that the entrant becomes more sensitive or exposed to variations in the roaming rate. As noted earlier, Covec estimated that the variation in the entrant's market share was between 44% and 78% as the roaming rate increases from 14 cpm to [ ]**CRI** cpm. Under the amended results, this variation increases to in excess of 100%. This increased sensitivity of the entrant's business case to changes in the roaming rate is a result of roaming costs being a higher proportion of the entrant's total costs under the amended model. This is due in part to the lower cellsite capital costs referred to in the preceding paragraph, the lower interconnection costs (15 cpm instead of 20 cpm) and in part to the increased volume of minutes originated by the entrant's retail subscribers (and hence, for a given roaming propensity, an increased volume of roamed minutes).

243. This is evident in Table 4, which compares the estimated roaming costs for the entrant, given a roaming rate of [ ]**CRI** cpm, as a proportion of the entrant's total costs, using the assumptions made by Covec and the amendments discussed earlier.

Table 4: Roaming Costs as Proportion on Total Costs

	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Covec						
Roaming costs (mill)	$17.9	$32.8	$48.2	$65.6	$83.6	$248.2
Total costs (mill)	$141.3	$202.4	$260.2	$310.5	$363.2	$1,277.6
Roaming %	13%	16%	19%	21%	23%	19%
Amended						
Roaming costs ($M)	$18.8	$40.2	$64.6	$92.3	$123.5	$339.4
Total costs ($M)	$137.9	$194.5	$256.4	$324.0	$399.3	$1,312.2
Roaming %	14%	21%	25%	28%	31%	26%

244. By overstating a number of non-roaming costs, the Covec assumptions result in roaming costs representing a lower proportion of the entrant's overall cost base. As a result, a given change in the roaming price will result in a relatively small proportionate change in the entrant's total costs, and hence a relatively small change in the market share required to cover those costs.

245. The sensitivity of the entrant to the roaming rate tends to decrease for entrants with greater levels of coverage. For an entrant whose network covers the five main population centres (which is the maximum level of coverage allowed in the Covec model), the variation in break-even market share between the counterfactuals and the factual diminishes, as shown in Table 5.

Table 5: Amended Covec model: Results for Five City Coverage

ARPU reduction	**Roaming rate (cpm)**		
	Factual	Counterfactual	
	14.0	[ ]**CRI**	[ ]**CRI**
0%	13%	17%	26%
5%	16%	21%	33%
10%	19%	25%	42%
15%	23%	32%	52%
20%	29%	40%	64%
25%	36%	50%	77%

246. The above results indicate that when compared to a counterfactual of no regulation, the inclusion of the roaming service as a designated service is likely to have a significantly positive effect in terms of promoting new facilities-based entry. The amended model estimates that, faced with a designated roaming rate of 14 cpm, an entrant would have to achieve a market share of between 13% and 19% (given plausible ARPU reductions) within five years in order to be financially viable. Under the counterfactual of no designation, the range of break-even market shares increases to between 17% and 48% (depending on the level of coverage).[67]

247. In terms of whether the market shares referred to above are achievable within five years, the Commission has examined the experience of entrants in a number of overseas mobile markets. The following observations are made only as a guide as to what might be realistically achieved within such a timeframe.

[67] The 17% to 48% is the range of counterfactual market shares presented in Table 3 and Table 5 for ARPU reductions of up to 10%.

248. In the UK, Cellnet (now O_2) and Vodafone were the first two mobile operators. Further entry occurred with One2One in 1993, and Orange in 1994. Within five years of first entering the market, One2One had achieved 13% of subscribers, while Orange had reached 17%. By 2002, the four mobile operators had approximately equal market shares.

249. In Ireland, Meteor entered in 2001, although it initially did not have roaming access onto either of the incumbent's networks. Meteor signed a national roaming agreement with O_2 in 2004, at which point its market share was 6.4%. Meteor's share subsequently increased to 10.7% in 2005, and further to 15.6% in 2006.

250. In Australia, Vodafone entered with a GSM network in 1993, to compete with existing mobile operators Telstra and Optus. By 1997, Vodafone's market share was 12.6%, and had reached 16.6% by 2006.

251. In addition, Vodafone has informed the Commission that it has also considered market share data from Europe, which indicates that an entrant could expect to achieve a market share of around 20% within five years, when penetration at launch is between 20% and 40%. Given the much higher current penetration in New Zealand, Vodafone considers that an entrant share of 15% is more realistic for New Zealand.[68]

252. The estimated break-even market shares with a designated roaming rate are broadly consistent with the range of market shares that have been achieved by entrants in other jurisdictions (see Table 6). The higher level of penetration in the current New Zealand mobile market, compared to penetration levels when entry occurred in other jurisdictions, may make these market shares more challenging. However, compared to the counterfactual of no designation, the Commission considers the viability of new entry would be considerably enhanced by the introduction of cost-based roaming, and that designation would be likely to facilitate new entry to an extent that would not occur in the absence of such designation.

253. In considering whether there is a case for extending existing regulation to the price terms of the roaming service, the Commission has also placed some weight on the lack of entry that has occurred in New Zealand. The Commission notes that discussions on roaming have been ongoing for a number of years, however no entry has occurred. While there may be other factors that have contributed to the lack of a third mobile entrant, the ability of incumbents to determine the price of the roaming service, and the relatively high roaming rates offered, are likely to have been significant issues for prospective entrants. In subjecting the price of this service to cost-based regulation, an important component of the entry decision is secured.

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[68] Vodafone letter to Commerce Commission, 10 July 2007.

Table 6: Cellular mobile competition in the OECD 2005

Mobile operator market share according to number of subscribers (%)

Number of Operators	1	2	3	4	5	Other
Australia	45.1	32.5	17.2	5.2		
Austria	39.6	24.4	20.7	12	3.3	
Belgium	48.3	33.4	18.3			
Canada	36.4	26.9	36.7			
Czech Republic	41	40	19			
Denmark	41.2	23.5	21	5	9.3	
Finland	65.7	4.3	18.5	11.5		
France	46.8	35.9	17.3			
Germany	37.3	36.8	13.6	12.3		
Greece	37.4	35.6	19.4	7.6		
Hungary	45	33.2	21.8			
Iceland	63.6	34.3	2.1			
Ireland	48.6	38	13.4			
Italy	40	33.1	19.1	7.8		
Japan	53	23.5	15.8	2.8		4.9
Korea	50.9	32.1	17			
Luxembourg	53	40	7			
Mexico	78.9	14	4	3.1		
Netherlands	51.2	23	11.3	14.5		
New Zealand	52.8	47.1				
Norway	59.5	24.4	8	6.3	1.8	
Poland	35	31	34			
Portugal1	46.4	38.3	15.3			
Slovakia	55.5	44.5				
Spain	46.1	30	23.9			
Sweden	52	27.9	17	3.1		
Switzerland	62.5	18.5	18.3	0.7		
Turkey	63	22	15			
United Kingdom	26	23.3	22.7	22.6	5.4	
United States	25.4	24.1	21	10.2	5	14.3

1. Secretariat estimates

Source: OECD Communications Outlook 2007

254. There has been a lack of competitive pressure in offering roaming terms to new entrants. This has been manifest in the price terms that have been previously offered in the absence of significant regulatory pressure, with average roaming prices being at least twice the likely cost of providing the service.

255. In addition to the importance of the level of the roaming rate, it is also likely that an entrant that is considering a substantial investment, some of which will be sunk, in constructing a mobile network will require a degree of certainty around

any access price that it faces. The Commission considers that some form of regulatory oversight, through direct regulation of the roaming price (or through the Commission accepting an appropriate undertaking from an access provider), would provide greater certainty and hence would improve the conditions for entry.

Preliminary conclusion on roaming

256. The Commission considers that the impact of cost-based regulation of the price of the roaming service would result in a substantial reduction in the price of the service, compared to what would otherwise be offered by access providers not subject to regulation or regulatory pressure. Given the above results, the magnitude of this reduction is such that the likelihood of entry would be materially enhanced by regulation or an appropriate undertaking accepted by the Commission.

257. In evaluating the need for further regulation and in considering the possible nature of such regulation, the Commission considers that greater certainty for potential entrants over the level at which the roaming price is set is an important consideration.

6. Impact Analysis of Amendments – Co-location

Evaluating the Impacts on Competition of Designation

258. In the absence of price regulation, there may be insufficient incentives for existing mobile network operators to offer co-location services at a reasonable price to a potential entrant. These incentives will reflect effects that apply when an entrant seeks a co-location agreement as a basis for reducing the costs of network construction as a means of entering the retail mobile services market and competing with the existing mobile network operators.

259. On one hand, co-location may facilitate the entry of a competitor who will compete for retail market share, and a portion of the share gained by the entrant is likely to be at the expense of existing incumbents, including the network operator providing co-location. This has been referred to as the "business stealing" effect.[69] From the point of view of the incumbents, this effect is likely to be detrimental, and be shared across all incumbents.

260. The second effect of entry will be a positive effect on the network that provides co-location. In allowing the new entrant to place its radio equipment on existing structures, the existing mobile network operator will receive a contribution from the entrant towards the capital costs associated with those structures. This "network-sharing" effect will therefore reduce the cellsite costs of both the incumbent and the entrant. The cost-reducing benefits of this effect will accrue exclusively to the network operator providing the co-location service.

261. In contemplating whether to provide co-location services on reasonable terms to an entrant, incumbent operators will implicitly weigh up the downside from allowing co-location which facilitates new entry (loss of retail share) - a detriment which is shared with other retail competitors - with the upside from providing co-location (a reduction in cellsite costs) - a gain which is captured exclusively by the access provider. This could be regarded as a form of 'damage limitation'. It is probable that entry would have a net detrimental effect on incumbents, but this could be limited by the sharing of cellsite construction costs with the entrant.

262. The expectations of the incumbents will be important. If it is unlikely that the entrant will obtain co-location from the other incumbent network operator, then there is little incentive to offer access on reasonable terms. Refusal to do so will not result in the benefits accruing to a competing network.

263. However, if each incumbent mobile network operator considers that the entrant is likely to gain a co-location agreement from the other incumbent network, then

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[69] OECD, *Competition and Regulation Issues in Telecommunications*, February 2002, page 36.

each has an incentive to compete to provide co-location in order to capture the benefits from the cost reductions that result from co-location.

264. The Commission understands that Telecom and New Zealand Communications have reached agreement allowing New Zealand Communications to co-locate on Telecom's mobile sites, although technical issues remain unresolved[70]. Telecom and New Zealand Communications have agreed on a formula for calculating co-location rental which comprises of a capital and operational component. Part of the capital component of that formula requires a figure for the capital cost of a tower. In relation to monopoles, that figure has been agreed by the parties to be approximately [ ]**TCNZRI/NZCRI.** This combined with the other capital costs associated with the site results in a co-location rental of approximately [ ] **TCNZRI/NZCRI** per annum, which is to be allocated on the basis of the number of antennae.[71] The Commission understands that although Vodafone has provided a draft agreement to New Zealand Communications, no agreement has yet been reached between the parties.

265. The Commission considers that the co-location pricing principles proposed by Telecom in the Issues Paper are reasonable. The Commission uses a similar approach to calculate the annual capital costs associated with the TSO. The parameters used in the annuity calculation result in an annual rental of approximately 16% of the replacement cost of the facility. This annual rental is to be shared between the parties who are co-locating equipment at the site.

266. The area of likely contention for co-location is with respect to the value of the replacement cost of the facility on which co-location takes place. For example, in its submission on the Issues Paper, Woosh referred to recent examples of the cost of building cellsites – including Woosh's average cost of building a site ($128,000), an independent assessment of the cost of building one of Vodafone's sites ($131,165), and the cost of building one of Woosh's sites in Wellington ($131,474) – and submitted that these are considerably below the site costs contained in Vodafone's initial draft undertaking ($275,000). The Commission understands that this has been an area of contention between Vodafone and New Zealand Communications that resulted in negotiations being stalled.

267. The Commission has not attempted to calculate a cost-based co-location price. Such costs are likely to be specific to the type of site at which co-location is sought. In the Issues Paper, the Commission noted that co-location costs are likely to vary considerably from one site to another. Telecom's submission on the

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[70] Monopoles are the only type of tower on which New Zealand Communications is interested in co-locating on.

[71] It should be noted as other capital costs and operational costs on a site will vary, this figure is only approximate (may not represent the average) and will vary on a site by site basis

Issues Paper also refers to the variety of co-location facilities, including different mast types, site-specific foundations, and access and utility costs.[72]

268. As such costs are likely to vary from site to site, there would be considerable regulatory costs associated with determining site-specific co-location costs.

269. Moreover, it appears that co-location costs are capable of being resolved in a commercial context, as appears to have been the case with New Zealand Communications and Telecom.[73] Such costs could be determined from independent sources, for example equipment vendors in the case of structures, and civil engineers in the case of foundations. Determining these costs may be amenable to some form of expert arbitration, in the event that the parties are unable to reach agreement.

270. The fact that New Zealand Communications has reached agreement with Telecom on the terms of co-location may change the incentives facing Vodafone when negotiating with New Zealand Communications or other entrants. In effect, if entry occurs, both existing mobile operators are likely to lose some market share at the retail level. However, Telecom has been able to capture some offsetting benefit in the form of sharing the cost of its cellsites with New Zealand Communications through its co-location agreement. This may provide some incentive for Vodafone to reach commercial agreement with a potential entrant on co-location, in order to be able to gain some benefit from entry.

271. The contention about the value of the replacement cost could be addressed by the Telecommunications Carriers' Forum (TCF) amending the Co-location Code and the Master Co-location Agreement to include a method of valuing replacement costs of the co-location facilities, with dispute resolution being available in the event that agreement couldn't be reached.

Preliminary conclusion on co-location

272. The Commission has not quantitatively assessed the impact of designating co-location. However, a commercial agreement appears to have been reached between Telecom and New Zealand Communications.

273. The Commission's analysis suggests that designation of co-location would be likely to have a relatively minor incremental impact in terms of promoting new

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[72] In the amended undertaking, Vodafone also noted that the replacement costs of the structures supporting co-location will vary between different sites.

[73] According to New Zealand Communications, they are only interested in co-locating on monopoles. In negotiations, New Zealand Communications commenced with a view that the capital cost to be used in the formula for determining the co-location rental of a monopole tower is [ ]**NZCRI**, while Telecom put the figure at [ ]**NZCRI/TNZRI**. The two parties reached agreement at approximately [ ] **NZCRI/TNZRI**.

entry when compared to the counterfactual. However, the Commission recognises that the issues around replacement costs which would deter entry may be able to be resolved by amendments to the Co-location Code and the Master Co-location Agreement.

7. Vodafone Undertaking

Introduction

274. In the previous two chapters, the Commission has assessed the impact on competition of designating the roaming and co-location services. The Commission concluded that the impact of cost-based regulation of the price of the roaming service would result in a substantial reduction in the price of the service.

275. An Undertakings regime was incorporated in the Act via the amendments made on 22 December 2006 which allows a relevant access provider to submit proposed terms and conditions of supply of a service that the Commission is proposing to regulate, as an alternative to regulation.

276. If an undertaking could deliver benefits similar to regulation it is likely to best give effect to section 18 of the Act, and may be considered as a suitable alternative to regulation.

277. An access provider must make the undertaking no later than 40 working days after the date on which the Commission commences an investigation into a proposed regulatory change under clause 1 of Schedule 3 of the Act.

278. The Commission gave public notice on 16 November 2006 that it was commencing an investigation into whether or not to make amendments to the roaming and co-location services.

279. On 19 January 2007, the Commission received an application for an undertaking from Vodafone and invited submissions on the undertaking from interested parties.

280. The Commission received submissions from interested parties on 13 March 2007.

281. On 5 April 2007, the Commission provided Vodafone with a preliminary view of the undertaking.[74]

282. Clause 16(3) of Schedule 3A of the Act requires the Commission to allow the access provider a reasonable opportunity to amend the undertaking in light of the submissions made prior to the Commission reaching a decision. The Commission gave Vodafone twenty working days to amend the undertaking in light of the submissions received.[75]

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[74] Letter from Borthwick (Commission) to Chignell (Vodafone) 5th April 2007
[75] Vodafone later applied and was granted a ten day extension.

283. The Commission received an amended undertaking from Vodafone on 22 May 2007.

284. Vodafone considers that its undertaking provides a simple alternative to regulation on terms that the Commission can negotiate and agree and make available to access seekers.[76]

285. The following sections assesses the Vodafone undertaking and whether a recommendation by the Commission to the Minister to accept it is likely to best give effect to section 18 of the Act.

Form of Undertaking

286. The original undertaking did not contain any terms relating to implementation or operational procedures. The Commission in its preliminary view considered that all the major terms and conditions of agreement that may be required between the access seeker and Vodafone to ensure a smooth and timely provision of Vodafone's roaming service must form part of the undertaking, including implementation and operational processes.

287. Vodafone has now included terms and conditions for the roaming service in the undertaking[77]. Vodafone has listed the matters that should be included in an operational plan as part of the undertaking.[78] Vodafone has also made provisions in the undertaking for unresolved matters relating to the implementation plan to be referred to a technical expert for resolution.[79]

288. With respect to co-location, Vodafone notes that the terms and conditions would be those set out in the Radiocommunications Co-location Code and Master Co-Location Agreement or such other terms and conditions as Vodafone and the access seeker may agree on.

289. Accordingly, the Commission considers that the concerns raised regarding the form of the undertaking have been largely addressed by Vodafone.

Existing commercial agreement

290. Clause 2.2 of the original undertaking excludes access seekers who already have a commercial agreement with Vodafone from accessing the terms of the undertaking.

291. Clause 3 of Schedule 3A of the Act provides that the Commission may, while considering a proposed regulatory change, accept an offer from an access provider

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[76] Vodafone NZ, *Submission in support of application for Undertaking*, 19 January 2007
[77] For example, terms relating to confidentiality and intellectual property
[78] Clause 29 of Schedule 3 of Amended Vodafone Undertaking, 22 May 2007
[79] Clause 2.2 of Schedule 3 of Amended Vodafone Undertaking, 22 May 2007

to supply a service to all access seekers on the terms and conditions of a written undertaking.

292. In the Commission's preliminary view[80], if an undertaking is accepted by the Commission and the Minister and is registered under clause 6 of Schedule 3A of the Act, the access provider must supply the services to all access seekers in accordance with the terms of the undertaking.

293. Vodafone has amended the undertaking to allow for any person who qualifies as an access seeker to access the service under the terms of the undertaking. Vodafone has also proposed that an access seeker signs and executes a Deed of Acceptance for the roaming service. In the Deed, the access seeker agrees that the undertaking is legally binding and that they will comply with all of the obligations of an access seeker set out in the undertaking. The Deed provides that Vodafone may enforce the terms of the undertaking against the access seeker.

294. The Commission considers that the concerns raised in its preliminary view have been addressed by Vodafone.

Exclusive provider

295. Vodafone had included an exclusivity clause as part of the original undertaking.[81] This clause stated that during the term of the undertaking, Vodafone will be the exclusive provider of services equivalent or similar to the roaming services to access seekers.

296. The Commission noted that the exclusivity clause in the undertaking does not appear to be consistent with the promotion of competition for the long-term benefit of end-users. The Commission considered that Vodafone should demonstrate how exclusivity will be in the best interest of end-users.

297. Vodafone has removed the exclusivity provision in the original undertaking. However, if an access seeker chooses to acquire roaming services from another access provider, provisions have been included that allow Vodafone to terminate the contract with the access seeker on six months' notice[82].

298. The Commission is satisfied with Vodafone's amendments relating to the concerns raised in the Commission's preliminary view.

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[80] Letter from Borthwick (Commission) to Chignell (Vodafone) 5th April 2007
[81] Clause 8.1(a) of Vodafone's Undertaking, 19 January 2007
[82] Clause 13.1 of Amended Undertaking, 22 May 2007

Roaming on to 3G networks

299. The roaming service offered by Vodafone as part of the original undertaking was a 2G only voice/SMS/data roaming service and restricted access to the Vodafone 3G or HSPDA networks.

300. The Commission considered that a technology-neutral roaming service that does not restrict services to 2G voice/SMS/data roaming services would be a more desirable service that would assist new entry and promote competition for the long-term benefit of end-users.

301. Vodafone's amended undertaking makes provision for roaming on its 3G network if it decommissions or reduces capacity of its 2G network.[83] However, Vodafone considers that its investment incentives must be maintained and that roaming on to its 3G network or other new technologies based on 3G (HSDPA) should only become available to access seekers four years after they are launched commercially by Vodafone.[84]

302. Accordingly, Vodafone proposes to make 3G W-CDMA (excluding HSDPA) available by August 2009, HSDPA by September 2010, and any other radio access network technologies, within the 3G W-CDMA family of technologies, four years after the date on which that radio access network technology is first used by Vodafone.[85]

303. The Commission notes that Vodafone's main competitor in the mobile market is Telecom. Telecom currently uses a different technology to provide 3G services but will be deploying the same technology as Vodafone in late 2008. The Commission considers that Vodafone would continue to invest in 3G in order to compete effectively with Telecom, and that such incentives to invest and innovate will be increased to the extent that facilities-based competition is strengthened.

304. The Commission also notes that Vodafone has indicated that its 3G network has increased capacity and not all the capacity is currently being utilised. Vodafone has publicly acknowledged that roaming is a form of wholesale service. In a recent press release, Vodafone noted that its agreement with Compass:[86]

> It is a great way for us to make the most of the investment we have made in our new 3G network. This network brought with it enormous additional capacity, and reselling this capacity through Compass and others is great for Vodafone, for our resellers and for New Zealanders who want more choice.

[83] Clause 3.4 of Amended Undertaking, 22 May 2007
[84] Vodafone NZ, *National Roaming and Co-location Undertaking: Vodafone's response to Commission's preliminary view*, 22 May 2007
[85] Clause 3.3 of Schedule 3 of Amended Vodafone Undertaking, 22 May 2007
[86] Vodafone NZ, *More Choice for New Zealand Mobile Phone Users*, Media Release 1 June 2007

305. The Commission consider that if Vodafone is offering services utilising 3G to other wholesale customers, it should not discriminate on the basis of whether the entrant is a facilities-based or service-based entrant.

306. In order to promote more effective competition in mobile services, new entrants must be able to offer similar services to the incumbents. Accordingly, the Commission considers that the Vodafone roaming services should be technology neutral and should not be restricted to '2G like' services.

Undertaking term

307. Vodafone's original undertaking was for a duration of five years from the date of registration except in cases of early termination.[87]

308. Clause 7(1)(a) of Schedule 3A of the Act states that the registration of an undertaking is effective for a period of 5 years from the date of registration. An undertaking may only expire before the five year period if the Commission recommends to the Minister that an undertaking should expire earlier than the 5-year period.

309. The Commission's preliminary view was that Vodafone could not terminate or withdraw its undertaking after it had been registered.

310. Vodafone has removed clause 4.2 of its original undertaking. The Commission is satisfied that Vodafone will continue to make the terms of the undertaking available to other access seekers if it terminates an access seeker's access where that access seeker is in breach of the terms of the undertaking. However, the Commission considers that the 24 month period stipulated by Vodafone before it could once again supply the services to an access seeker is too restrictive.

Initial coverage area

311. Vodafone proposed that the access seeker builds at least 150 cell sites before roaming is made available to it under the terms of the undertaking.

312. Potential access seekers in their submissions suggested that the initial coverage area should remain at 10% but that this should be clarified to refer only to population.

313. The Commission's preliminary view was that that an appropriate initial coverage threshold could be that an access seeker should be required to build a network comprising of 150 cell sites or that covers 10% of the population, whichever is lower.

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[87] Under clause 4.2 of the original Undertaking, Vodafone may withdraw or terminate the Undertaking at any time

314. Vodafone has amended the undertaking to allow for some flexibility in the initial coverage area required from an access seeker before it could become eligible to access roaming under the terms of the undertaking. Vodafone has revised the number of cell sites required downwards from 150 sites to 100.

315. The Commission is satisfied with this downward revision as this reduces the required threshold for a new entrant to access the roaming service. An access seeker wishing to access the Vodafone roaming services is expected to build a network comprising of 100 cell sites or that covers 10% of the population, whichever is lower.

Set-up costs

316. Under the terms of the undertaking, access seekers are required to reimburse Vodafone for all development costs to establish the roaming service.

317. In its preliminary view, the Commission noted that in previous Commission decisions, access providers have not been permitted to recover the costs involved in implementing capability to deliver regulated services. The Commission expected this to apply in respect of the set-up costs involved in providing roaming services under the undertaking, as the undertaking has been submitted as an alternative to regulation.

318. Vodafone notes that the set-up costs for roaming are likely to be considerable as special features are required to support the service and these have not yet been deployed by Vodafone.[88]

319. Vodafone believes that some level of cost recovery is appropriate, and has included a small increment to the base charges for each service enabling the access seeker to repay the development costs over time and in line with revenues.[89] Specifically, Vodafone has included an increment of $0.01 per unit of roaming traffic.[90]

320. The Commission acknowledges that in supplying the roaming service, Vodafone may incur additional costs compared to what it would incur as a retail only supplier without the need to provide roaming. These costs may include fixed set-up costs and ongoing costs associated with dealing with access seekers.

321. The Commission has previously considered how best to allocate various set-up and ongoing costs associated with providing access. In Decision 554, the Commission set out a number of principles relating to cost recovery in relation to

[88] Vodafone NZ, *National Roaming and Co-location Undertaking: Vodafone's response to Commission's preliminary view*, 22 May 2007, para. 12
[89] Ibid
[90] Clause 9, Schedule 2 of Amended Vodafone Undertaking, 22 May 2007

Number Portability[91]. The overarching principle is section 18 of the Telecommunications Act. In terms of specific principles, the number portability determination sets out the following:

- Cost minimisation: the cost allocation mechanism should provide an incentive to operators to minimise the cost of providing number portability;
- Cost causation: the cost allocation mechanism should result in charges to porting customers that send the appropriate price signals on how much porting should be consumed. In other words, cost causation implies that those customers who cause costs should pay those costs;
- Alignment of costs with benefits: the cost allocation mechanism should provide for the recovery of costs from both customers who are porting their numbers and those who are not, as number portability generates industry-wide benefits as well as benefits that accrue only to porting customers.
- Practicality: the cost allocation mechanism should be both easy to implement and to enforce.

322. In addition, the Commission noted the need to consider the impact of cost allocation on the incentives of operators to compete with each other for customers; and the implications for the switching costs faced by customers.

323. Vodafone argue that number portability is a multi-network service (where all participating networks potentially benefit by being able to attract customers as well as lose customers), and that in such cases the equal sharing of costs is appropriate. Vodafone also note that most of the currently regulated services were already being provided by Telecom, and therefore the associated "set-up costs" had been recovered some time ago.

324. While number portability is a multi-network service for which access seekers are also access providers, the Commission considers that the cost allocation principles set out above can be applied in respect of one-way access services such as roaming. Any differences in the underlying services can be appropriately taken into account when applying the various principles to that service.

325. The Commission also notes that while some of the existing regulated services had been supplied by Telecom for some time, it was nevertheless necessary to consider how to allocate any set-up and ongoing costs as part of the Commission's wholesale determinations. Telecom had submitted that it would incur additional costs in providing the regulated wholesale services, for example to the extent that previous manual systems had to be replaced by automated systems (such as operational support system (OSS) costs).

[91] Commerce Commission, *Determination on the multi-party application for determination of 'local number portability service' and 'cellular telephone number portability service' designated multinetwork services, Final Determination,* 31 August 2005

326. In this regard, the Commission notes that Ofcom used similar principles in considering the appropriate recovery of OSS costs in relation to local loop unbundling (LLU) in 2004.[92] In assessing the recovery of costs, Ofcom was guided by six general principles:[93]

- cost causation – costs should be recovered from those whose actions cause the costs to be incurred at the margin;
- distribution of benefits – costs should be recovered from the beneficiaries, especially where there are externalities;
- effective competition – the mechanism for cost recovery should not undermine or weaken the pressures for effective competition;
- cost minimisation – the mechanism for cost recovery should ensure that there are strong incentives to minimise costs;
- reciprocity – where services are provided reciprocally, charges should also be reciprocal; and
- practicability – the mechanism for cost recovery needs to be practicable and relatively easy to implement.

327. These principles are broadly similar to the criteria used by the Commission in the number portability determination. Ofcom concluded that system set-up costs associated with LLU should be recovered across all local loops, including those used to service BT's own retail customers.

328. The set-up costs referred to by Vodafone appear to relate to establishing systems necessary to support the provision of roaming on its network. According to Vodafone, special features from its network vendor would be required to support roaming, and these features have not yet been deployed, although it appears that Vodafone has already incurred some costs in relation to its national roaming agreement with TelstraClear.[94]

329. While it could be argued that system set-up costs associated with providing access are only incurred as a result of the access seeker requesting access, it could also be argued that such costs arise from a regulatory response to existing market power. Ofcom acknowledged this in the case of LLU, and concluded that the cost causality principle does not provide definitive guidance on the allocation of system set-up costs.

330. In previous instances where the Commission has accepted that costs be recovered by the access seeker, this has related to variable costs that are incurred by the access provider when one of its customer switches to the access seeker. For

[92] Ofcom "Review of the wholesale local access market Explanatory statement and notification", 26 August 2004.
[93] ibid, page 80.
[94] Vodafone submission, 22 May 2007, page 5: "In the case of TelstraClear's first National Roaming Agreement in 2005, the incremental development costs for Vodafone were $4.98 million, which represented a significant proportion of the forecast charges over the first 3 years."

example, in such cases the access provider may incur various administrative costs in transferring the customer to its competitor. These costs vary with the level of switching that occurs. In order to encourage an efficient level of switching, the Commission has accepted that the costs of switching should be borne by the access seeker.

331. However, in the case of roaming access, such switching costs do not appear to be relevant. As long as the roaming rate reflects the underlying cost of the roaming service, the level of roaming that occurs should be reasonably efficient.

332. In terms of cost minimisation, the Commission is concerned that Vodafone's proposal may not create sufficiently strong incentives for Vodafone to ensure that its system set-up costs are genuinely incremental costs and are efficiently incurred. The greater the proportion of these costs that are recovered from access seekers who will be competing with Vodafone in the retail mobile services market, the lesser incentive for Vodafone to minimise these costs. The principle of cost minimisation would therefore suggest that Vodafone should be faced with some contribution towards these costs.

333. The principle that costs of an activity should be recovered from those who benefit from that activity suggests that set-up costs be spread across both parties. Where there is spare capacity within the access provider's network not assigned to current or planned services, making access available to access seekers allows the access provider to achieve greater economies of scale through increasing network utilisation in areas where excess capacity existed.

334. While the ability to roam has a direct benefit to the access seeker and its retail subscribers, roaming is regarded as promoting competition as it reduces a significant barrier to entry in the form of offering national coverage. To that extent, subscribers that remain with either Vodafone or Telecom are likely to receive some benefit from a more vigorously competitive retail market, as both incumbent network operators are forced to improve their quality of service in order to retain customers. The aligning of costs with benefits therefore suggests that set-up costs be recovered from both parties.

335. The principle relating to maintaining effective competition requires that any allocation of costs does not distort competition at the retail level. This would suggest that the set-up costs incurred by the access provider, and also any incurred by the access seeker, be recovered in a competitively neutral manner. If such costs are broadly related to the size of the respective parties, then requiring each operator to bear their own set-up costs will be consistent with the principle of maintaining effective competition. This would have the roughly equivalent effect of pooling the system set-up costs of both parties, and allocating them on the basis of market share, although it would be a simpler mechanism for cost recovery.[95]

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[95] However, if these costs are not related to the size of the operator, then some form of transfer may be appropriate. For example, if the access seeker does not incur set-up costs of a similar nature, it may be

336. There may also be a number of practical issues associated with Vodafone's proposal to include a margin to the roaming rate to reflect its system set-up costs. These largely relate to the level of transparency of the underlying costs, and how such costs may be pro-rated in the event that additional entrants require roaming in the future.[96] The Commission considers that such a proposal would likely lead to disputes between Vodafone and access seekers.

337. At this stage, the Commission considers that requiring each party to bear their own system set-up costs would be most consistent with the above set of cost allocation principles. Accordingly, the Commission's preliminary view is that no margin should be added to the base roaming rate to recover these costs from access seekers.

338. The table below summarises the cost allocation principles discussed above.

Table 7: Summary of Cost Allocation Principles

Principle	Cost allocation suggested by principle
Cost minimisation	Each party bearing their own costs provides stronger incentives for access provider to minimise set-up costs of providing the roaming service
Cost causation	No definitive guidance
Alignment of costs with benefits	Each party bearing their own costs better aligns costs with benefits
Effective competition	Each party bearing their own costs is likely to be competitively neutral
Practicality	Each party bearing their own costs is more practical

Access fee

339. The Commission considers that Vodafone is entitled to some protection against credit risk. The Commission considers that normal commercial terms should apply in the case of access fees to minimise Vodafone's credit exposure.

340. Vodafone has indicated that the access fee will be $20,000 per month and will be a pre-payment against credit risk.

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appropriate for Vodafone to receive some contribution to its costs. As discussed earlier, any such contribution should be based on efficiently-incurred costs, and should relate to the increment of service supplied to the access seeker.

[96] For example, Vodafone has noted that it incurred incremental development costs of $4.98 million in respect of the national roaming agreement between Vodafone and TelstraCear in 2005. It is not clear how those costs, which have already been incurred in respect of one access seeker, would be dealt with where subsequent entry occurs (especially if those costs are 'incremental' to roaming, rather than 'incremental' to a specific access seeker).

341. The Commission's view is that this level of access fees does not seem unreasonable when compared against current revenues in the mobile market. The Commission considers that it may be reasonable and appropriate to allow an alternate form of credit cover to be provided such as a letter of credit from an investment grade bank.

342. However, the Commission would need to obtain assurances from interested industry participants as to whether such a fee is reasonable and in line with normal commercial practices.

Question 6.1

(a) What sort of credit cover should access seekers be required to provide?
(b) Is $20,000 per month enough protection against credit risk?
(c) If not what would be an appropriate access fee?

Wholesale

343. Under the original undertaking, access seekers can only wholesale their retail services with the approval of Vodafone. The Commission considered that access seekers should not need the approval of Vodafone to wholesale their retail services.

344. Vodafone has removed the need in the amended undertaking for an access seeker to gain approval from Vodafone before wholesaling its retail services. The Commission considers this to be in line with its preliminary view.

Excluded Operator

345. In the original undertaking, Vodafone has excluded Telecom and all its subsidiaries from accessing the terms of the undertaking. The amended undertaking also excludes Telecom and all its subsidiaries.

346. As noted elsewhere in this report[97], the Commission considers that competition will be promoted in mobile markets for the long term benefit of end-users if the roaming service allows access seekers to provide mobile services as long as the access seekers network can technically interconnect with the access provider's network.

347. The Commission considers that there are likely to be overall benefits from having same technology competition in the mobile market. Consequently, the Commission considers that the Vodafone roaming service should not exclude Telecom from accessing the service.

[97] See discussion under Access Seeker Definition

Wireless LAN Services

348. The Vodafone roaming services in the undertaking exclude wireless LAN services (also known as WiFi and WiMax) or any similar services.[98]

349. As noted elsewhere in this report, the Commission considers that the roaming service should be technology-neutral and should be permitted as long as technical interconnectivity and compatibility can exist between networks.[99]

Numbering

350. In the amended undertaking, Vodafone has restricted the MSISDN ranges that are to be supported to the mobile number code blocks (02X Non-Geographic Service Numbers). Vodafone notes that Geographic Service numbers assigned to an access seeker under Part 7 of the Telecommunications Numbering Plan Number Allocation Rules or Geographic Service Numbers that are ported in to the access seeker will not be supported for roaming purposes and cannot be used to register on the Vodafone network.

351. The Commission notes that the issue of numbering is the responsibility of the Number Administrator under the Number Administration Deed and Number Allocation Rules. As such the Commission considers that the exclusion of a particular type of service from a particular number range should be made by the Number Administrator and not by Vodafone.

352. The Commission considers that if an access seeker complies with all Number Allocation Rules as set by the Number Administrator and its network can interconnect and is technologically compatible with the Vodafone network, then the access seeker should not be excluded from roaming on the Vodafone network.

International Roaming

353. The Vodafone undertaking currently restricts access to in-bound international roaming customers and the marketing of a "SIM swap" option.

354. The Commission understands that international roaming agreements are usually agreed on a reciprocal basis. The exclusion of in-bound international roaming customers restricts the ability of access seekers to conclude reciprocal international roaming agreements with mobile operators overseas.

355. The Commission considers that this limitation would prevent access seekers in New Zealand from offering a comprehensive service likely to be required by New

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[98] Schedule 1, Service Description, Amended Vodafone Undertaking
[99] See discussion under inter-network roaming

Zealand end-users. Accordingly such exclusion does not promote competition for the long-term benefit of end-users in New Zealand.

Handover between networks

356. The amended Vodafone undertaking requires call hand-over from the access seeker to the Vodafone mobile network to be subject to separate commercial agreement. The amended undertaking also excludes call handover from the Vodafone network to the access seeker mobile network.

357. The Commission considers that Vodafone has not justified these exclusions and these arrangements must form part of the undertaking.

Question 6.2

(a) Should call handover from the access seeker to Vodafone be subject to a separate commercial agreement?
(b) Should there be call handover from the Vodafone network to the access seeker network?

Co-location

358. Both Telecom and Vodafone have submitted principles underlying the calculation of the price payable by access seekers for co-location. The common principle is that the replacement cost of the facilities being shared by the access seeker(s) and the access provider should be recovered by way of an annual rental calculated by way of an annuity formula. The basic form of this annuity is:

$$\text{Annual rental} = \frac{r}{1 - \left[\dfrac{1}{(1+r)}\right]^N}$$

where r = pre-tax cost of capital
N = asset life

359. Telecom noted that it has used such a pricing formula in its negotiations with access seekers, and that this formula is similar to that used by the Commission.[100] The annual rental (which equates to approximately 16%) is applied to the modern equivalent value of the facilities supporting co-location, and the resulting annual capital cost is then allocated on a pro-rata basis, which to date has involved

[100] A variant of this formula (which includes price tilts and a 'time-to-build' parameter) is used by the Commission in its TSO determinations.

allocation on the basis of the number of antennas on the mast and use of floor space within equipment rooms.

360. Where incremental costs are incurred to make the facilities suitable for co-location, Telecom submitted that it has agreed with access seekers that the latter should bear all of those costs.[101]

361. In its amended undertaking, Vodafone has included a similar formula to Telecom as a basis of establishing an ongoing monthly rental to be paid by the access seeker, although the allocation is simply based on the number of parties. The amended undertaking also includes a payment option that allows the access seeker to make a one-off capital contribution to the replacement capital cost of the shared assets.

362. The Commission considers that the area of likely contention for co-location is with respect to the value of the replacement cost of the facility on which co-location takes place. For example, in its submission on the Issues Paper, Woosh referred to recent examples of the cost of building cell sites – including Woosh's average cost of building a site ($128,000), an independent assessment of the cost of building one of Vodafone's sites ($131,165), and the cost of building one of Woosh's sites in Wellington ($131,474) – and submitted that these are considerably below the site costs contained in Vodafone's original undertaking ($275,000).

363. The amended Vodafone undertaking no longer contains any reference to site build costs, but only refers to the two payment options for the access seeker (an upfront capital contribution, based on the number of parties co-locating at the site, or an ongoing monthly rental). In the amended undertaking, Vodafone notes that the replacement costs of the structures supporting co-location will vary between different sites. Telecom's submission on the Issues Paper also refers to the variety of co-location facilities, including different mast types, site-specific foundations, and access and utility costs.

364. While the level of appropriate replacement costs may be contentious, and such costs are likely to be specific to a particular site, such costs should be reasonably transparent. For example, information on the cost of purchasing a mast should be readily available from vendors, while costs related to the foundations of a cellsite could be sourced from civil engineers.

365. The Commission considers that a better method for apportioning costs would be an allocation made on the basis of the number of antennas on the mast and use of floor space within equipment rooms. The amended Vodafone undertaking does not cater for this allocation method.

[101] The Commission notes that this is in line with the Master Co-Location Agreement which provides guidelines on what should apply should a replacement mast be needed to accommodate the access seeker's equipment for co-location. Refer to Clause 12 of the Master Co-location Agreement.

366. The Commission also considers that a specific dispute resolution mechanism should be included as the determination of the actual replacement costs is likely to be contentious. Given the level of specificity, in particular in terms of site preparation, the services of an independent valuation expert could be sought to make a ruling on the replacement costs if a dispute arises. The amended Vodafone undertaking does not cater for any dispute resolution with regard to the replacement costs of the sites.

Roaming pricing

367. Under the original undertaking, Vodafone submitted a single price of 21.5 cents per minute (cpm) for voice roaming per leg. Vodafone also submitted a price of 9.5 cents for SMS per leg and 4.9 cents per Megabyte (MB) for data on its network.

368. In the amended undertaking, Vodafone has proposed a number of base roaming rates, of 14 cpm for voice roaming per leg, 5.1 cents per SMS, and 30.2 cents per MB for data. These rates exclude a 1 cent cost increment for the recovery of set-up costs.

369. As discussed below, the Commission considers that the pricing for the voice roaming service contained in Vodafone's amended undertaking represents a significant improvement over the rates in the original undertaking. This includes both the level of the roaming price (where the average voice rate has fallen from 21.5 cpm per leg to 14 cpm per leg), as well as the structure of the prices (with a constant average roaming rate replaced with an average rate that varies according to where the roaming service is provided). The Commission does, however, have a number of outstanding concerns around the price terms of the amended undertaking, and these are set out in a later section.

370. According to Vodafone's amended undertaking, the base (or headline) roaming rates reflect the average cost of providing roaming across its entire access network. However, Vodafone has introduced a form of de-averaged pricing for roaming access to its network, such that as an entrant progressively builds out its network (and in doing so roams onto only a portion of Vodafone's network), the average roaming rate will change to reflect the cost of providing roaming in those areas where roaming actually occurs. According to Vodafone, an entrant is unlikely to build a full national network, and so may rely on roaming onto an existing national network indefinitely. As such, Vodafone considers that roaming may not be transitional, and has submitted that in such circumstances, the only stable roaming rate will be a de-averaged rate based on costs.

371. Vodafone has calculated the relative costs of its radio access network in each of 31 different areas ("location areas"). Vodafone has noted that in principle, having individual de-averaged roaming prices for each area would be efficient. In a

submission on behalf of Vodafone, Covec has also noted that geographically de-averaged roaming prices would be efficient, open and transparent, and would allow an entrant to build out its network "without risk of adverse changes in the terms of roaming".[102]

372. However, Vodafone has also submitted that having 31 different roaming prices would be very complex, and as a result has not proposed geographically de-averaged roaming rates, but has instead proposed a single rate that varies according to the area in which the entrant requests roaming.

373. Therefore, rather than setting individual roaming rates for each area, as would be the case under a pure de-averaged pricing approach, Vodafone proposes a single roaming rate that reflects the average cost of roaming in those areas where the entrant does roam. As the entrant builds out its own network, the areas where roaming would be required will diminish, and the roaming rate would change to reflect this.

374. To implement this approach, Vodafone has estimated the access costs of its 2G network in each of its 31 location areas, corresponding to 31 Base Station Controllers (BSC). The BSCs are linked to 4 switches and roaming is switched on and off at the BSC. This means that roaming can be provided or withdrawn at the level of the location area.

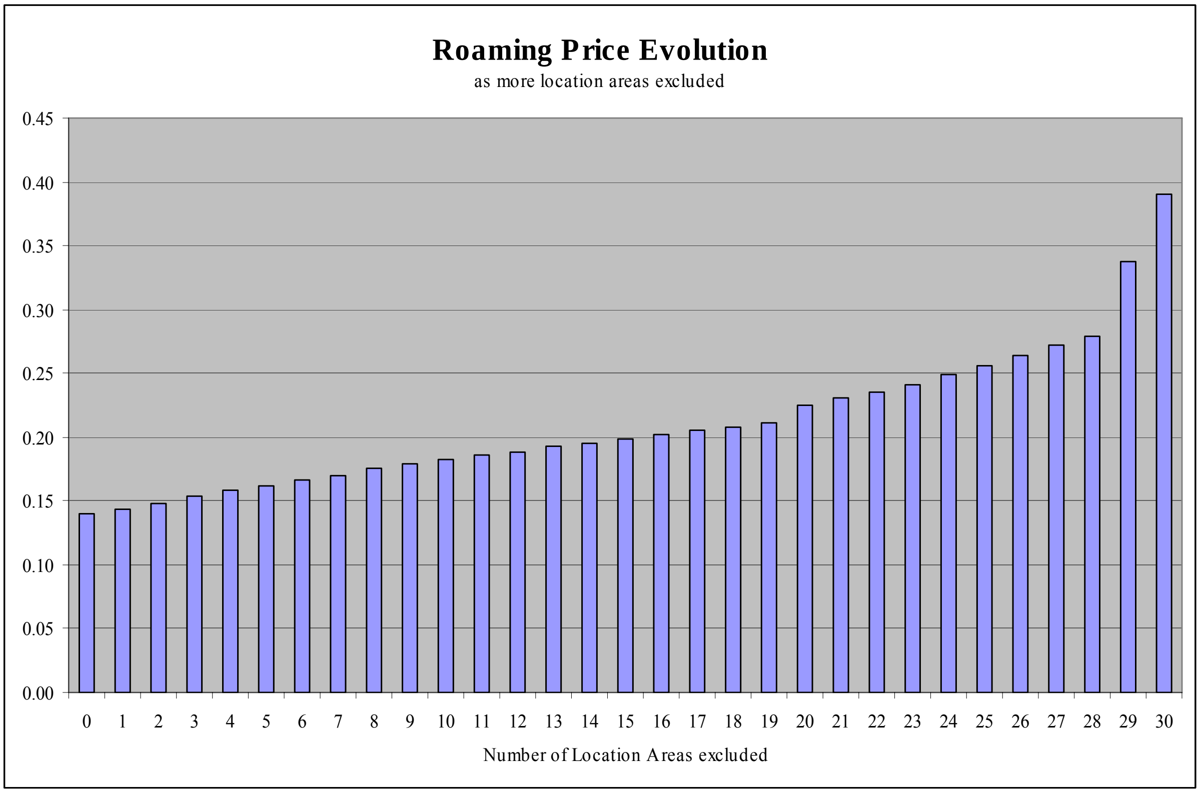
375. Vodafone has used the annualised costs of the cell sites in a location area and the traffic per cell site to estimate the unit access cost for each location area. The pricing mechanism in the amended undertaking proposes to derive an average roaming cost that varies as particular location areas (and their costs and traffic) are excluded.

376. Figure 2 shows the way in which the roaming rate would increase, as the number of location areas in which roaming occurs declines.

377. In principle, according to the roaming rates contained in the amended undertaking, an entrant that required roaming across the entire Vodafone network would be faced with a roaming rate of 14 cpm (excluding set-up costs). As the entrant continued to expand its network coverage, further location areas could be excluded,[103] which would result in the average roaming rate increasing as per the profile in Figure 2.

[102] Covec, "Efficient Pricing of National Roaming", May 2007.
[103] The Commission understands that under the amended undertaking, the decision to turn roaming off in a particular location area (i.e. the decision to exclude that location area) would be made by the entrant rather than Vodafone. Therefore, whether the average roaming rate would vary as the entrant deploys its network would be at the discretion of the entrant.

Figure 2: Roaming Price Evolution



<u>Principles of de-averaged versus averaged access prices</u>

378. The pricing in Vodafone's amended undertaking sets out a methodology for calculating roaming prices that vary according to the coverage of the access seeker's network. This is because according to Vodafone, the cost of providing roaming varies significantly from one area to another, and an entrant's roaming requirements will depend on the coverage of the entrant's network.

379. In principle, where costs vary substantially from one region to another, geographic pricing that reflects those cost differences will be more efficient than a single averaged price. A pricing structure that is de-averaged by region will provide better signals for efficient build-or-buy decisions by access seekers, as they will face the actual cost in a particular area. If the access seeker is instead faced with an average cost, this is likely to distort their investment decisions, resulting in a sub-optimal outcome.

380. In its submission on behalf of Vodafone, Covec states that:[104]

[104] Covec, "Efficient Pricing of National Roaming", May 2007, page 2.

> The cost attributable to a unit of mobile traffic varies dramatically by location in New Zealand. Many rural cell sites are very lightly used, with the result that the fixed costs associated with the site (which includes the cost of backhaul transmission) are spread across very few units of traffic. In urban locations, cell sites are much more heavily loaded, so the unit cost of service is lower.
>
> It follows that efficient roaming charges would vary with location. Since efficiency requires that prices reflect costs, the roaming charges should be higher in (say) Central Otago than an urban CBD.

381. However, as noted earlier, the pricing methodology proposed by Vodafone in the amended undertaking is not geographic de-averaging in its pure form. Geographically de-averaged pricing involves different prices in different areas, whereas the Vodafone proposal is for a single roaming price at a point in time, but the price would vary over time as the entrant deploys its network and hence changes its geographic demand for roaming services.

382. For example, under a pure de-averaged pricing approach, individual prices would be established for each region. Suppose there are five regions as illustrated in Figure 3, with the level of costs varying across those regions. With geographically de-averaged pricing, the roaming rate in area A would be lower than the roaming rate for area B, and so on. An entrant that requires roaming access in area B would compensate the access provider for the costs incurred in supplying the roaming service in that area, and likewise for other areas. If the entrant could build capacity in an area at a lower cost than supplied by the access provider, the entrant would supply services on the basis of its own facilities, rather than relying on roaming. Alternatively, if the entrant faced higher build costs than the incumbent, it would be more efficient to buy capacity off the incumbent (i.e. roam).

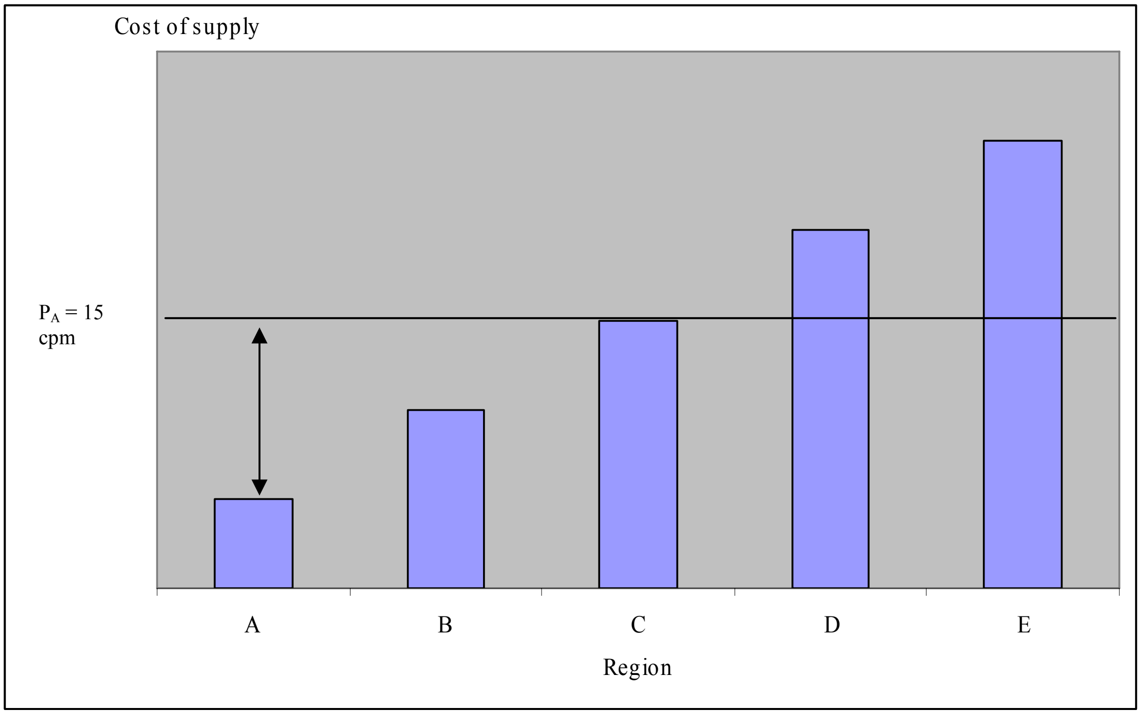
383. With a geographically averaged price, the roaming rate would be fixed at say 15 cpm, and this rate would apply to roaming in any area. Faced with such an average price for purchasing capacity from the access provider, the access seeker would be incentivised to enter with its own facilities in areas A and B, and to roam onto the incumbent's network in areas D and E. However, this does not mean that the access seeker is more efficient in areas A and B (or necessarily less efficient in areas D and E). For example, if the entrant's build costs in area A are less than the averaged roaming rate of 15cpm, but exceed the incumbent's actual cost in that area (i.e. in the range indicated), the use of an averaged roaming price would lead to inefficient entry.

384. Where costs vary from region to region, a de-averaged pricing approach is likely to have greater efficiency characteristics than an averaged pricing approach.

385. As noted earlier, Vodafone's amended undertaking does not adopt pure de-averaged prices. According to Vodafone, it would be too complex to set 31 different roaming rates that each correspond to one of its location areas. Instead,

Vodafone propose a single average roaming rate that varies as the entrant establishes and develops its own network.

Figure 3: De-averaged Pricing



386. Such an approach appears to better reflect the cost of supplying roaming where an entrant expands its network over time, compared to a single fixed roaming rate that remains constant. This is because as an entrant extends its network, it is likely to only require roaming on increasingly costly parts of the access provider's network. Under the amended undertaking, this would result in the average roaming rate increasing, whereas the increasing cost of supply would not be reflected in a constant roaming rate.

387. However, the Commission notes that the amended undertaking's use of an average roaming rate may still lead to some distortion in terms of the investment decision taken by the entrant. Consider an entrant who covers the lowest cost region with its own network, and who is considering whether to extend its network into the next lowest cost region. The entrant would compare the incremental cost of network construction in the next least cost region, with the average cost of roaming in all out-of-coverage areas. By definition, the average roaming cost would always exceed the cost of building out to the next lowest cost area. This would suggest that the entrant would end up replicating the entire national network of the access provider.

<u>Specific concerns over price terms in the amended undertaking</u>

388. In terms of the specific nature of the price terms contained in the amended undertaking, the Commission has a number of concerns.

389. First, the current costs used by Vodafone to calculate the de-averaged price are the civil and radio equipment costs of its 2G cell sites. However, under the amended undertaking, Vodafone retains the discretion to include other costs attributable to the access network portion of the entire Vodafone network. These costs may include operational expenditure relating to the access network and transmission costs.[105]

390. The Commission understands that Vodafone does not plan to do any work, at this stage, on including the operational and transmission costs.[106] However, the Commission considers that the inclusion of this caveat in the undertaking is unsatisfactory, as it creates considerable uncertainty over the level of roaming prices for an entrant. Inclusion of such a caveat creates a high likelihood that the headline rate quoted by Vodafone in its undertaking could rise above the 14 cents currently indicated if and when Vodafone decides to review its cost methodologies governing the determination of the headline rate.[107]

391. A second concern with the proposed pricing relates to the level of information that would be available to an entrant. Figure 2 outlines the structure of the roaming price. However, the Commission understands that the different location areas represented in the figure have not been provided to access seekers. If the access seeker cannot identify which location areas each number on the horizontal axis refers to, the Commission considers that this may impair their ability to make efficient build decisions. Covec's submission on behalf of Vodafone implicitly raises a similar concern, where Covec states that if an average roaming rate is set, and that rate is allowed to increase as the entrant deploys its network, the entrant could "complain that it was led into investing through false information."[108]

392. In making efficient build decisions, an access seeker would want to know what the roaming rate would be once coverage is extended to a particular area. The Commission considers that keeping that information confidential may mean that access seekers are unable to make informed decisions as to the likely cost of roaming and how this may impact on their business case. The Commission considers that this may not give the certainty necessary to facilitate entry into the mobile market.

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[105] See footnote 1 on Schedule 2 of Amended Vodafone Undertaking
[106] Email from Watt (Vodafone) to Forster (Commission) on 25 June 2007
[107] The Commission notes that in the Covec model, operating and transmission expenses are significant components.
[108] Covec, "Efficient Pricing of National Roaming", May 2007.

393. Thirdly, the Commission notes that under the original undertaking Vodafone was proposing a roaming price for data of 4.9 cents per MB. Under the amended undertaking, the de-averaged pricing principle adopted has seen the headline rate for data roaming increase to 30.2 cents per MB (excluding the set-up costs), which represents a substantial increase (in excess of 500%).

394. The Commission therefore considers that in moving from the averaged data pricing in the original undertaking to a de-averaged data price in the amended undertaking, the significant increase in data roaming rates may impair the ability of new entrants who require roaming on Vodafone's network to compete in the emerging mobile broadband market.

395. Fourthly, the Commission notes that the price for SMS is 5.1 cpm per leg rising to 16 cpm per leg. The Commission considers this to be high when compared to prices being offered by Vodafone such as the TXT2000 service which is currently being offered to Vodafone retail customers for $10 a month for 2000 SMS messages.

396. Fifthly, as noted elsewhere, the Commission considers that the roaming service should not be restricted to a particular technology. Vodafone has indicated that the roaming rates contained in the amended undertaking are based on Vodafone's estimated costs of its 2G network. To the extent that roaming would be available on newer, lower cost technologies, it may be appropriate for this to be reflected in cost-based roaming.

397. Finally, the Commission considers that further clarification surrounding the evolution of roaming rates in the amended undertaking would be useful. In particular, Vodafone has indicated that the 10% (or 100 site) "sunrise" clause in the undertaking will mean that an access seeker will have to include a set of location areas in its initial exclusion zone,[109] and that as a result, the roaming rate will differ from the headline rate. However, Vodafone has also indicated that under the amended undertaking, the decision to exclude an area will be made by the access seeker. This suggests that an access seeker with a network that satisfies the sunrise clause could nevertheless decide to request roaming in all areas, and hence would face the headline roaming rate.

398. The Commission therefore considers that while the pricing approach taken by Vodafone in the amended undertaking may be appropriate to the extent that it endeavours to reflect the cost of roaming in those areas where the roaming service is actually used, there remains considerable uncertainty over the way in which such pricing would be implemented. Such uncertainty is likely to be particularly severe from the perspective of an access seeker.

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[109] Vodafone letter to Commerce Commission, "National Roaming and Colocation Undertaking: Vodafone's response to Commission's preliminary view", 22 May 2007, page 8, second bullet.

Conclusion on Vodafone Undertaking

399. The Commission provided Vodafone with a preliminary view of the original undertaking which was submitted on 19 January 2007. Vodafone's amended undertaking (22 May 2007) addressed a number of the Commission's concerns.

400. In making a decision on whether or not to recommend that the Minister should accept the undertaking, the Commission must make a recommendation that the Commission considers best gives, or is likely to best give effect to section 18 of the Act. The Commission must also be satisfied that the undertaking is a suitable alternative to the proposed regulatory change.

401. The Commission has assessed the amended undertaking and considers that the undertaking in its current form is unsatisfactory because of the reasons outlined above and summarised below.

402. The Commission considers that the restriction of roaming to 2G networks is not consistent with section 18 of the Act and does not promote competition in telecommunications markets for the long-term benefit of end-users. The Commission considers that an alternative to regulation should be forward looking and the exclusion of other technologies such as WiFi and WiMax is likely to limit competition in mobile markets.

403. The Commission considers that both access seekers and access providers would benefit from roaming, as would the retail subscribers of both. Access seekers would be able to acquire customers and provide services outside their network footprint. Access providers would be able to achieve greater economies of scale through increasing network utilisation in areas where excess capacity exists. Retail subscribers would benefit from increased competition in the provision of retail mobile services. Given the distribution of these benefits, the Commission considers that both access seekers and access providers should bear their own set-up costs. The Vodafone undertaking requires access seekers to bear all the costs even though the benefits would be shared between the parties and their subscribers.

404. The Vodafone undertaking excludes Telecom from accessing roaming services. The Commission considers that there are likely to be overall benefits to end-users from having same technology competition in the mobile market. Consequently, the Commission considers that the Vodafone roaming service should not exclude Telecom from accessing the roaming service.

405. The Commission considers that the access seekers end-users would not be able to obtain competitive roaming rates overseas due to the restriction placed by the Vodafone undertaking on in-bound international roaming. This, the Commission considers, does not promote competition for the long-term benefit of end-users.

406. With regard to co-location, the Commission considers that a better method of apportioning costs would be an allocation made on the basis of the number of antennas on the mast and use of floor space within equipment rooms. The Vodafone amended undertaking currently caters for an even split between all parties co-locating on a site.

407. The Commission also considers that a dispute resolution mechanism should be included as the most contentious issue regarding co-location is the replacement costs of the site.

408. The Commission considers that although the pricing methodology for the roaming service in the amended undertaking may have some efficiency-enhancing characteristics to the extent that it represents a form of de-averaging (and hence better reflects the cost of supplying roaming than does a constant average roaming rate), there remain a number of areas of uncertainty over the price terms in the amended undertaking.

409. The Commission, therefore, is not satisfied that the amended Vodafone undertaking in its current form is likely to best give effect to section 18 of the Act.

8. Service Specification

Introduction

410. In this investigation the Commission is considering whether or not to:

- amend the non-price terms of the national roaming service;
- move the national roaming service from a specified to a designated service; and
- move the co-location service from a specified to a designated service.

411. The Commission considers that cost-based regulation of the roaming service would result in a substantial reduction in the price of the service and consequently materially enhance the likelihood of entry in the mobile services market.

412. The Commission considers that in the case of co-location, it may be more appropriate for changes to be made to the Co-location Code and the Master Co-location Agreement to cater for some currently unresolved issues rather than designating the service.

413. The Commission notes that Telecom has announced plans to launch a nationwide GSM network giving it the ability to offer roaming to a new entrant. Telecom has indicated that they are committed to offering roaming on reasonable terms on their GSM and W-CDMA networks. Telecom notes that the terms of its roaming service will be similar to those incorporated in Vodafone's undertaking.[110]

414. Telecom further indicated that they will not preclude any operator from accessing the Telecom roaming services. However, Telecom expects that any operator seeking to roam on to a Telecom network would offer a reciprocal roaming service to Telecom on terms substantially similar to the terms of Telecom's roaming service.[111]

415. Telecom note that its roaming service will be made publicly available - in the form of a "public undertaking".[112]

416. The Commission considers that the Vodafone undertaking, currently under consideration, in its current form is not a suitable alternative to regulation for the reasons stated in the previous chapter. In the absence of a satisfactory undertaking, the Commission would recommend designating the roaming service and amending the non-price terms of the roaming service.

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[110] Telecom NZ, Mobile Technology Briefing, 28 June 2007
[111] Ibid
[112] Ibid

417. In the event that the Minister accepted an undertaking from Vodafone in relation to roaming, the undertaking would become the terms of supply for national roaming services on Vodafone's network. Other access providers (such as Telecom) would be required to provide roaming services in accordance with the terms of the national roaming service in the Act. Under clause 3 of Schedule 3A of the Act, the Commission is able to recommend that the Minister should accept the undertaking and that the proposed regulatory change be made. In the event that both recommendations were accepted by the Minister, Vodafone would be required to provide national roaming in accordance with the terms of its undertaking and Telecom and any other access provider would be required to provide roaming in accordance with the amended national roaming service.

418. As the Commission has not yet received a satisfactory undertaking from Vodafone, the Commission has not considered the impact of both accepting an undertaking and amending the national roaming service at this stage.

419. Clause 2(2) of Part 1 and Clause 9(2) of Part 2 of Schedule 3 of the Act requires the Commission to include the detail of the proposed alteration and proposed addition to Schedule 1 in its Draft Report.

420. In Chapter 4 of the Issues Paper, the Commission sought submissions from interested parties on how roaming should be defined, and what restrictions, if any, should be put on a description of roaming for the purposes of amending the currently specified service. The Commission also asked for comment on whether the service description should be broadened such that it could apply across a range of network types.

421. The following section discusses the specifications of an amended roaming service.

Initial coverage area

422. The current roaming regulation can only be accessed if an access seeker commits to rolling out a national network, and only after having rolled out 10% of the area in which the New Zealand population normally lives or works.[113]

423. In the Issues Paper, respondents were asked whether the requirement to roll out a network before the regulated roaming service could be accessed was still relevant. They were also asked whether the coverage should be population or area-based.

[113] The percentage roll out requirement may be waived as long as all other conditions as described in the Act are met.

Telecom's view

424. Telecom submits that a minimum coverage threshold is one way of ensuring that an entrant is committed to infrastructure investment and not just looking for cheap network access.[114]

425. Telecom proposes that the threshold be determined with respect to the access provider's network coverage.

Vodafone's view

426. Vodafone submits that 'sunrise' requirements are useful to avoid timewasters and to ensure that entrants are actually network builders as opposed to MVNOs in disguise. Accordingly, Vodafone initially proposed that the access seeker builds at least 150 cell sites before roaming is made available.[115]

427. Vodafone subsequently revised the 150 cell sites it originally proposed to 100 cell sites. This new figure was included as part of Vodafone's amended undertaking.[116]

TelstraClear's view

428. TelstraClear proposes that the rollout requirement be amended to be 10% of the population, thus reducing uncertainty in the interpretation of the rollout requirement.[117]

New Zealand Communications' view

429. New Zealand Communications submits that a 10% threshold is appropriate and should cover population as area is not a realistic measure in practical terms given the disparity between population densities and physical geography.[118]

Kordia's view

430. Kordia considers that to promote competition in the mobile market, the Commission should remove the restriction that the access seeker should have achieved a network roll-out covering a minimum percentage of the New Zealand population.[119]

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[114] Telecom New Zealand Ltd, *Issues Paper Submission*, March 2006
[115] Vodafone NZ, *Submission to the Commerce Commission Issues Paper*, March 2007
[116] Schedule 3 of Amended Vodafone Undertaking, 22 May 2007
[117] TelstraClear, *Submission on Issues Paper*, March 2007
[118] New Zealand Communications, *Submission on Issues Paper*, March 2007
[119] Kordia Group Ltd, *Submission on Issues Paper*, March 2007

Commission's preliminary view

431. The Commission notes that most parties favour some form of initial network roll-out before access seekers are able to make use of a regulated roaming service.

432. The Commission notes that in many overseas jurisdictions there is an initial coverage requirement before roaming is available. The Commission has reviewed practices associated with regulated roaming roll-out requirements in other countries in order to identify any additional insights that may be helpful.

433. In the United Kingdom, roaming services would only be provided from the time a new entrant provided services in a geographical area where 20% of the UK population lives.

434. In Ireland, the national roaming obligation would only be effective when a new entrant has rolled out a mobile network infrastructure capable of serving at least 20% of the Irish population.

435. The Commission notes that Vodafone has revised the 150 cell sites originally proposed and is suggesting that the sunrise requirement be 100 cell sites. The Commission considers that the 100 cell site coverage area is closely representative to the 10% population coverage suggested by other interested parties.

436. The Commission's preliminary view is that an appropriate initial coverage threshold should be that an access seeker is required to build a network comprising of 100 cell sites or that covers 10% of the population, whichever is lower.

<u>Network roll-out</u>

437. Interested parties were asked whether there was a need for a national roll-out and whether it should be expressed as a percentage of the population, as the Act does not specify what national roll-out means.

Telecom's view

438. Telecom suggests that in addition to the initial 10% coverage threshold, a further network coverage target should be introduced. According to Telecom, the access seeker should be required to commit to covering between 50% and 80% within 5 years.[120]

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[120] Telecom New Zealand Ltd, *Issues Paper Submission*, March 2006

TelstraClear's view

439. TelstraClear proposes that a definition of 'national network' be established and that this should cover 70% of the population. TelstraClear argues that this will ensure that the access seeker retains the incentive to build a network.[121]

New Zealand Communications' view

440. New Zealand Communications supports a view where a national network should be considered as a network that provides coverage to at least 80% of the population.[122]

Kordia's view

441. Kordia considers that to promote competition the Commission should remove the requirement that an access seeker of the regulated roaming service commits to a full national mobile network roll-out.[123]

Vodafone's view

442. Vodafone views partial entry as the most likely scenario for a third and fourth entrant in New Zealand and notes that a national roll-out requirement makes partial entry based on the regulated service impossible.[124]

443. However, Vodafone noted that if an average roaming rate is envisaged, then a build out obligation is vital as it limits the time that an access provider is exposed to below cost roaming rates in high cost areas.[125]

Commission's preliminary view

444. With mobile penetration in the New Zealand mobile services market at 100%, the Commission considers that such high levels of penetration makes the business case for national entry more challenging.

445. The Commission considers that the likely customers of a new entrant would most probably be existing subscribers switching from another mobile network. Mobile network operators can incur substantial costs generally referred to as subscriber acquisition costs (SAC) in acquiring new customers. The Commission considers that these costs would make setting a time-bound national roll-out requirement (100 % population coverage) particularly stringent and may result in the uneconomical duplication of resources in certain areas.

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[121] TelstraClear, *Submission on Issues Paper*, March 2007
[122] New Zealand Communications, *Submission on Issues Paper*, March 2007
[123] Kordia Group Ltd, *Submission on Issues Paper*, March 2007
[124] Vodafone NZ, *Submission to the Commerce Commission Issues Paper*, March 2007
[125] Ibid

446. The Commission also considers that a national roll-out requirement may prohibit new entrants with a business case for regional entry from entering the mobile services market.

447. The Commission considers that if the roaming price is efficiently set, this would limit the scope for free-riding on an access provider's network, and the level of roaming that occurs should be reasonably efficient in that it would take into account the actual cost of providing roaming in those areas where the entrant has not built a network.

448. The Commission's preliminary view is that competition in the mobile services market would be promoted by not requiring a new entrant to commit to rolling out a national network.

Inter-network roaming

449. In the Issues Paper, the Commission requested submissions on whether roaming should be allowed between different technology types (e.g. between WiMax and GSM or between CDMA and GSM technologies). During the Commission's review of entry issues in the mobile services market,[126] some fixed lined operators suggested that the roaming regulation should be forward looking and technology neutral, thus allowing for possible fixed-mobile convergence.

Telecom's view

450. Telecom considers it too early to determine whether it would be advantageous to widen the definition of access seeker to include operators of other wireless networks such as WiMax. Accordingly Telecom concluded that the Commission should not seek to regulate before there is demonstrable market failure.[127]

TelstraClear's view

451. TelstraClear does not consider it necessary for the Commission to make roaming available for WiMax and Wi-Fi as, according to TelstraClear, there is no demand for roaming using these services.[128]

New Zealand Communications' view

452. New Zealand Communications suggests that inter-network roaming should be reviewed by the Commission when it is technically and commercially feasible.

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[126] Commerce Commission, *A Review of Cellular Mobile Market Entry Issues*, 10 October 2006
[127] Telecom New Zealand Ltd, *Issues Paper Submission*, March 2006
[128] TelstraClear, *Submission on Issues Paper*, March 2007

According to New Zealand Communications, to do so now would be premature and would raise complex technical, commercial, and regulatory issues.[129]

Vodafone's view

453. According to Vodafone, inter-network roaming is unlikely to be feasible because network interconnectivity does not and is unlikely to exist. Vodafone also notes that even if there was connectivity, there would be a hard handover i.e. calls would be dropped and would need to be re-established. Vodafone also noted that beyond CDMA/GSM devices, inter-network roaming is unlikely to be a serious issue within the regulatory timeframe normally considered.[130]

Kordia's view

454. Kordia believes that any amended roaming regulation must be forward-looking and technologically neutral, or else it will quickly become obsolete. Kordia would like to see a broadening of regulated access to permit roaming between networks that use different technology.[131]

CallPlus' view

455. CallPlus is of the view that the definition of roaming is too restrictive and should be technology-neutral and forward-looking. CallPlus submits that taking a restrictive approach that focuses on legacy networks is not in the best long-term interest of consumers.[132]

Woosh's view

456. According to Woosh, inter-network roaming is an essential element of any roaming service. Woosh further noted that roaming should not be only restricted to 'me too' services and the best opportunity for a new entrant in the New Zealand market is to deploy a technology more advanced than the existing mobile networks such as WiMax.[133]

TUANZ's view

457. According to TUANZ, no network operator should be required to offer roaming access to an incompatible device (e.g. a Wi-Fi or WiMax device) or to a device without a recognised network subscription.[134]

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[129] New Zealand Communications, *Submission on Issues Paper*, March 2007
[130] Vodafone NZ, *Submission to the Commerce Commission Issues Paper*, March 2007
[131] Kordia Group Ltd, *Submission on Issues Paper*, March 2007
[132] CallPlus, *Submission on Issues Paper*, March 2007
[133] Woosh, *Submission on Issues Paper*, March 2007
[134] TUANZ, *Submission on Issues Paper*, March 2007

Commission's preliminary view

458. The Commission notes that recent developments in the mobile industry suggest that mobile handsets featuring inter-standard switching capabilities may become a technical and commercial reality in the near future. For example, Telecom is already offering a Samsung mobile handset with dual technology, GSM and CDMA capabilities, though this switching between the two technologies is only applied for international roaming services.

459. The Commission considers that technologies such as WiMax are next-generation wireless technologies that enhance broadband wireless access. Fixed WiMax is now in the early adoption phase, whilst mobile WiMax is not yet commercially available. The technologies behind WiMax will be capable of providing VoIP services to mobile and nomadic devices.

460. The Commission considers that the broadband and mobile markets are moving targets, each shifting from the support of basic service sets to enhanced multimedia applications. However, there are a number of hurdles that must be overcome for mobile WiMax to take off, including global spectrum availability, the development and adoption of mobile broadband applications, and a definition of the major differentiators of WiMax products as compared to existing broadband and mobile technologies.

461. In New Zealand management rights for spectrum in the 2.3 GHz, which is the preferred range for mobile WiMax operators, expire in 2010. However, the government has recently announced that the rights to this spectrum band together with the 2.5 GHz band will be auctioned off in December 2007. Spectrum for WiMax deployment will therefore become available in New Zealand by the end of the year.

462. The success of either fixed or mobile WiMax will largely depend on the price and availability of WiMax-certified products. According to Kordia, the first mobile WiMax products are expected to be certified in the first quarter of 2007.[135] This is a view supported by Ericsson. However, Ericsson notes that PDAs and handheld devices that offer mobility with WiMax may only be on the market in 2009 and beyond.[136] With a major network such as Sprint Nextel committing to WiMax technology, this may assist in making mobile WiMax handsets available earlier due to the scale of the Sprint operation.[137]

463. The Commission considers that regulation should be forward-looking and should allow for future technologies. There is a distinct possibility that WiMax and other wireless technologies could be commercially available within the timeframe

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[135] Kordia Group Ltd, *Submission on Issues Paper*, March 2007
[136] Ericsson, *WiMax – Copper in the Air*, White Paper, April 2006
[137] Sprint Nextel has announced plans to implement a nationwide mobile WiMax broadband network in the United States, covering 100 million potential subscribers by the end of 2008.

regulation is currently being considered. However, the Commission does not consider it necessary to form a definitive view on the likely commercial success or otherwise of these technologies. In the Commission's view, the key issue is that for any technology that supports or potentially supports services with mobility characteristics, coverage is likely to be important in terms of marketing such services to end-users. The Commission considers that end-users of WiMax and other future technologies may need to roam on to GSM networks to provide coverage when end-users move outside their network provider's network footprint.

464. Furthermore, the Commission notes that most fixed line operators interested in other wireless technologies are regionally based and would need to provide coverage outside their regions to their customers if they are to be competitive. Access to roaming would likely promote competition for the long-term benefit of end-users. Any unjustified restrictions on who can access the roaming service may limit the downstream benefits to end-users.

465. Accordingly the Commission considers that the roaming service should be technology neutral and should be permitted as long as technical interconnectivity and compatibility can exist between the networks.

3G-3G roaming

466. The current service description in the Act limits roaming to second generation cellular mobile services. In the Issues Paper, the Commission asked for comment on whether an amended roaming regulation should include 3G-3G roaming.

Telecom's view

467. Telecom note that end-users would be significantly disadvantaged in a '2G only roaming' situation and will not receive the full benefits of new 3G services such as video telephony, video streaming and high speed data.[138]

468. However, after the announcement of the launch of its W-CDMA network, Telecom noted that Vodafone's proposed 4 year window within which roaming on 3G or new technologies will not be available is a sensible compromise between protecting investment incentives and future-proofing regulation.[139]

New Zealand Communications' view

469. According to New Zealand Communications, denying access to 3G would result in a regulator-created differentiation in service which would be used as a competitive differentiation in service by the access provider.[140]

[138] Telecom New Zealand Ltd, *Issues Paper Submission*, March 2006
[139] Telecom NZ, Mobile Technology Briefing, 28 June 2007
[140] New Zealand Communications, *Submission on Issues Paper*, March 2007

470. New Zealand Communications noted that a forward-looking approach would have the Commission moving immediately to technology-neutral cellular roaming, including 3G voice and data. A limitation on 3G roaming according to New Zealand Communications was dynamically inefficient.[141]

TelstraClear's view

471. TelstraClear argue that forward-looking regulation should avoid technical specifications and should be service based. According to TelstraClear, technology neutrality is required to ensure that an access provider could not withdraw access to roaming by replacing its 2G equipment with 3G.[142]

472. However, TelstraClear would like to see roaming regulation restricted to "2G-like services", such as voice and SMS, as this would maintain incentives for access providers to continue further 3G investments, without a requirement to provide higher value data services to access seekers.[143]

Vodafone's view

473. According to Vodafone, 3G does not solve the perceived market failures that lead to roaming regulation any better than 2G and the need for nationwide coverage could be easily delivered with 2G roaming.[144]

474. Vodafone also considers that any roaming regulation that included 3G would send a very poor signal to infrastructure builders.[145]

Other parties

475. Kordia, TUANZ and Woosh all argued for the inclusion of roaming on to 3G networks as part of any amended roaming regulation.

Commission's preliminary view

476. When the Telecommunications Act was enacted in 2001, 3G was an emerging technology. However, 3G has become more prevalent in recent years and any new entrant into the cellular mobile market would most likely enter the market using 3G technology as there is an increasing demand from end-users for mobile data services.[146]

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[141] Ibid
[142] TelstraClear, *Submission on Issues Paper*, March 2007
[143] Ibid
[144] Vodafone NZ, *Submission to the Commerce Commission Issues Paper*, March 2007
[145] Ibid
[146] New Zealand Communications is entering the market with 3G technology. Telecom is also deploying 3G technology

477. The Commission considers that limiting roaming capability to 2G networks may restrict new entrants from offering products that are able to compete effectively with the products offered by existing operators. Furthermore, the Commission considers that customers are primarily interested in services rather than the technologies behind the services. Roaming is intended to provide for a position of competitive neutrality between any new entrant and incumbent mobile operators by specifically addressing the need to provide national coverage to attract customers. Limiting roaming to 2G would mean that a new entrant is unable to provide the services that some of their customers may want.

478. In the mobile termination reconsideration report[147], the Commission concluded that it is difficult to align technology characteristics with the investment incentives. The Commission considers this to still be a valid conclusion. As a consequence, the Commission considers that a technology neutral roaming service that does not restrict services to '2G like' services would be a more desirable service that would assist new entry and promote competition for the long-term benefit of end-users.

479. The Commission notes that Vodafone's main competitor in the mobile market is Telecom. Telecom currently uses a different technology to provide 3G services although Telecom has announced that it will be deploying W-CDMA technology which is the equivalent 3G technology used by Vodafone. As a result Vodafone has added incentive to continue investing in 3G in order to ensure that it competes effectively with Telecom.

480. The Commission also notes that Vodafone, in various submissions made to the Commission as well as at the recent TUANZ conference,[148] has found that 3G has greater capacity than 2G and therefore its 3G capacity is currently under-utilised. At the TUANZ conference Vodafone announced that it would be offering wholesale deals to other industry players who are interested in launching mobile services, as 3G is the future of mobile services.

481. The Commission considers that if Vodafone is offering its excess 3G capacity to other providers, it should not discriminate on the basis of the type of entrant (i.e. whether the entrant is a facilities or service based entrant).

482. It is unlikely that there would be a drop in incentives to invest. Vodafone would be interested in maintaining its market position as its biggest threat in the market is Telecom. As a result of the competitive threat from Telecom, the Commission considers that Vodafone will continue to invest to maintain its competitive edge as it currently has a greater mobile market share than Telecom.

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[147] Commerce Commission, *Schedule 3 Investigation into Regulation of Mobile Termination, Reconsideration Final Report*, April 2006

[148] TUANZ Conference 31 March 2007

483. The Commission considers that the threat from Vodafone would result in Telecom expanding its initial investment in 3G networks to be able to effectively compete with Vodafone.

484. In order to promote more effective competition in mobile services, new entrants must be able to offer similar services to the incumbents. Accordingly the Commission's view is that roaming should be technology neutral and should not be restricted to '2G like' services. Roaming should be permitted as long as technical interconnectivity and compatibility can exist between technologies.

Access Seeker definition

485. The current definition of an access seeker in the Act for the roaming service is:

> An existing or potential cellular mobile telephone network operator (except Telecom or Vodafone or their successors or subsidiaries) that holds sufficient radio spectrum rights to enable that operator to roll out a nationwide cellular mobile telephone network in New Zealand

486. In the Issues Paper,[149] the Commission noted that cellular mobile network operators that do not have sufficient radio spectrum rights to enable them to roll out a nationwide cellular mobile telephone network will not be considered as access seekers and will therefore be unable to access any regulated roaming service.

487. Consequently, the Commission asked for comment on the most appropriate description of an access seeker, whether there should be alignment in the access seeker and access provider definitions, and whether the definitions should cater for fixed-mobile convergence.

New Zealand Communications' view

488. New Zealand Communications considers that the current definition in the Act is sufficient.[150]

TelstraClear's view

489. TelstraClear considers that the description of an access seeker for the roaming service as provided in the Act is appropriate. TelstraClear does not consider it necessary to amend the definition to cater for fixed-mobile convergence.[151]

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[149] Commerce Commission, *Schedule 3 Investigation into Amendments to the Roaming & Co-location Services, Issues Paper*, December 2006
[150] New Zealand Communications, *Submission on Issues Paper*, March 2007
[151] TelstraClear, *Submission on Issues Paper*, March 2007

Vodafone's view

490. Vodafone considers that the requirement to hold sufficient spectrum rights to support a national roll-out may no longer be required. Vodafone considers that it may be necessary to distinguish between domestic inter-carrier roaming from international roaming, and that inserting the phrase "New Zealand-based" may be helpful in that regard.[152]

491. Vodafone does not consider that fixed-mobile convergence should be catered for at this stage. They note that the Commission has options to address this if the need arises in the future.[153]

CallPlus' view

492. CallPlus considers the current access seeker definition too restrictive. CallPlus would like to see a forward-looking approach that considers spectrum limitations as well as facilitating broader inter-network national roaming.[154]

Telecom's view

493. Telecom considers that the access seeker definition should be broadened and should include both Telecom and Vodafone. Telecom argues that maintaining the exclusion can reduce competition and lessen customer benefits in the long-run.[155]

494. Telecom notes that roaming access for new entrants lowers the cost of roll-out which in turn lowers the risk of entry, promotes the growth of competition, and increases the likelihood of competitive entry. Telecom considers that this logic is equally relevant if it were to migrate from CDMA to GSM technology.[156]

495. Accordingly, Telecom considers that any operator seeking to build a new network should be able to avail itself of the access that is available to new entrants.

496. Telecom considers it too early to determine whether it would be advantageous to widen the definition of access seeker to cater for fixed-mobile convergence.

497. Telecom also considers that the requirement to have sufficient spectrum for a national network should remain.

[152] Vodafone NZ, *Submission to the Commerce Commission Issues Paper*, March 2007
[153] Ibid
[154] CallPlus, *Submission on Issues Paper*, March 2007
[155] Telecom New Zealand Ltd, *Issues Paper Submission*, March 2006
[156] Telecom subsequently announced that it was building a network based on GSM technology

Commission's preliminary view

498. In Australia, roaming is not a declared service. However, the Commission understands that there are a number of, albeit limited, domestic inter-carrier roaming agreements between carriers. These tend to apply in areas where one carrier has no network coverage.[157]

499. In Ireland, following its market analysis into wholesale mobile access and call origination, ComReg concluded that there should be an obligation in relation to network access including an obligation to provide national roaming to other network operators who have built out at least 20% of their networks.[158]

500. The Commission notes that in the Irish case, this decision was reached after ComReg concluded that there was evidence of a jointly held position of market dominance between Vodafone and O_2 in the Irish mobile market, and that this position was reinforced and sustained by the refusal to grant roaming access to a mobile network operator with limited coverage.[159]

501. The Commission considers that denying access to the roaming service by operators who intend to provide mobile services may not be consistent with the section 18 purpose statement of the Act.

502. In this regard, the Commission notes that Telecom has announced plans to deploy a mobile network based on GSM technology. The Commission considers that there are costs and benefits that could accrue to end-users if there was same technology competition.

503. At current levels of mobile penetration in New Zealand, a new entrant or an existing mobile operator switching technologies may need to offer incentives (such as handset subsidies to new customers whose existing phones are not supported by the technology) to attract new customers. This raises the operational costs of the operator, which will ultimately be passed on to the end-users resulting in them paying higher retail prices.

504. Same-technology competition may mean that existing customers may be able to more easily switch from one operator to another by simply replacing the Subscriber Identification Module (SIM) card. This would reduce an operator's SAC and may result in lower prices in downstream markets. The ubiquity of GSM systems and the ability for operators to source equipment from many suppliers may reduce the costs to the operator. GSM handsets are cheaper than

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[157] ACCC, *Mobile Services Review 2003*, April 2003
[158] ComReg, *Market Analysis – Wholesale Mobile Access and Call Origination – 04/118 and 04/118a p72* 9th December 2004
[159] ComReg, *Market Analysis – Wholesale Mobile Access and Call Origination – 04/118 and 04/118a p69* 9th December 2004

CDMA handsets due to economies of scale, and these could likely benefit end-users.

505. GSM/UMTS global subscription exceeds two billion and accounts for over 85% of global mobile subscription. New Zealand end-users who are interested in roaming internationally may derive more benefits if there was same technology competition in New Zealand as they would not necessarily have to change phones or acquire dual mode handsets to roam internationally.

506. The Commission considers however, that making roaming widely available to all access seekers as long as they satisfy the sunrise requirement may result in the reduction of competing network infrastructure in New Zealand. The Commission considers that a reduction in the level of competing network infrastructure in New Zealand may be detrimental in downstream markets.

507. The Commission considers that while same-technology competition in the mobile market may provide overall benefits, any change to the access seeker definition requires a cautious approach, to ensure that broadening the scope of the definition does not create a disincentive for expanding an access seeker's network.

508. The Commission considers that safeguards are necessary to ensure that access seekers continue to invest and expand their mobile network footprint. Consequently, the Commission considers that any access seeker with a total New Zealand mobile market share greater than 25% should not be allowed to roam in New Zealand cities.[160]

509. The Commission's preliminary view is that competition will be promoted in mobile markets for the long-term benefit of end-users if the roaming service allows access seekers to provide mobile services as long as the access seekers network can technically interconnect with the access provider's network. However, the Commission considers that access seekers with a total New Zealand mobile market share greater than 25% should not be allowed to roam in New Zealand cities.

510. The Commission considers that the requirement to hold sufficient radio spectrum rights to enable an operator roll out a nationwide cellular network would be unnecessarily stringent. The Commission considers that an access seeker only needs to hold sufficient spectrum rights to enable it to meet the proposed sunrise requirements (10% of the population or 100 cell sites) necessary to access the regulated roaming service.

Question 7.1

How does removing the restrictions on the access seeker definition affect the access provider's capacity to provide roaming?

[160] According to Statistics New Zealand, a city in New Zealand has a population of 50,000 people.

Pricing Principles

511. The initial pricing principle is the principle used to set an interim price. It has to be able to be applied relatively quickly by the Commission, but should be an estimate of the likely final price.

512. The initial pricing principle has implications for the final pricing principle, which should be broadly consistent with the approach taken for the initial pricing principle.

513. In the Issues Paper, the Commission asked for comment on the appropriate initial and final pricing principles for access to the roaming services.

Telecom's View

514. Telecom considers that roaming should remain a specified service because at a principle level, there is no facility in a mobile network that might be regarded as exhibiting features of an essential facility that is a possible bottleneck.

515. Telecom noted, however, that if the Commission is minded to recommend designation, the appropriate pricing methodology is one that is based on the retail price minus avoided costs saved methodology.

516. Telecom noted that such a pricing methodology is appropriate because it allows the access seeker a relatively pure wholesale price early on in the access seeker's network roll-out that corresponds to the average return the access provider earns on its network investments.

517. If the Commission came to the view that a cost-based pricing principle should be used, Telecom submitted that a price that increased over time would be justified, assuming an entrant will focus first on building out in low cost and/or high traffic areas, and then work out to high cost/low traffic areas. According to Telecom, this would suggest that an increasing price should be calculated in order to reflect the actual average costs of the parts of the access provider's network that are used over the period of the entrant's build programme.

Vodafone's view

518. Vodafone does not support regulation of roaming prices, and particularly not in areas where building is economically viable for an entrant.

519. Vodafone submitted that setting a roaming price based on whole network average costs will tend to encourage building in low cost areas by the entrant and deter the access provider from investing in high cost areas of its network.

520. Vodafone noted that a cost-based average rate (like a single TSLRIC price) would have to be regularly adjusted upwards if the roaming provider is to recover its costs and retain incentives to invest. According to Vodafone, underlying this problem is that the entrant will make build decisions at the margin, but the rate is set at an average.

521. Vodafone noted that the best answer to the perverse incentives of whole network average costs is to use a pricing methodology that is based on geographically de-average roaming prices.

522. According to Vodafone, a de-averaged rate that differentiates prices between different geographic areas is not equivalent to a build-out obligation and therefore allows the possibility of permanent partial entry.

523. Vodafone also submitted that an alternative to de-averaging is to strictly time limit access to roaming and use an average rate. They note that such an approach would retain the roaming provider's incentives to invest, and it would also avoid the risk of the Commission setting an erroneous roaming rate thus affecting the entrant's investment decision-making.

TelstraClear's view

524. TelstraClear submitted that cost-based pricing is the most appropriate methodology for access to roaming services. TelstraClear noted that cost-based pricing ensures that entrants face the same costs as the incumbent, which ensures that any entry is efficient.

525. TelstraClear noted that retail-minus pricing has a high risk of a roaming price in excess of cost because the current duopoly means that prices are likely to significantly exceed cost. A roaming price in excess of cost would mean efficient entry would be deterred.

526. TelstraClear considers that TSLRIC is the appropriate pricing principle because of its use in relation to other regulated services in New Zealand where the pricing is cost-based. TelstraClear also noted that the Commission recommended TSLRIC as the appropriate pricing principle for mobile termination.

527. According to TelstraClear, cost-based MTRs may provide an appropriate proxy for the roaming price, as the infrastructure involved for providing the service, and therefore the cost basis, are similar.

528. Given the absence of regulated roaming in most other jurisdictions, and regulated roaming prices in particular, TelstraClear suggested that a benchmarked price based on regulated prices for mobile termination from comparable jurisdictions that use TSLRIC pricing would be an appropriate initial pricing principle.

New Zealand Communications' view

529. New Zealand Communications submitted that a cost-based pricing methodology would be more appropriate for roaming. According to New Zealand Communications, cost-based pricing provides investment incentives to both new entrants and incumbents while simultaneously promoting productive, allocative and dynamic efficiency. New Zealand Communications noted that the most appropriate cost-based approach is TSLRIC.

530. New Zealand Communications noted that there were three possible approaches to estimating a cost-based final pricing principle through an easy-to-apply interim mechanism. These were:

(i) Benchmarking to roaming rates found in foreign markets;
(ii) Using domestic and/or foreign MTRs as a proxy for the final roaming rate; and
(iii) Using Short Run Marginal Costs (or SRMC "plus") as an estimate of the final rate.

531. New Zealand Communications noted that there are risks and benefits associated with each of these interim pricing mechanisms. However, New Zealand Communications considered that of these, an MTR proxy would appear to be best suited to determining an interim price.

TUANZ's view

532. TUANZ considers that a retail-minus pricing for roaming access would provide the most stable basis on which a roaming access seeker can offer some price competition to an incumbent.

533. TUANZ noted that roaming services, like termination services, present opportunities for transfer pricing manipulation, against which users and regulators must be vigilant.

534. TUANZ suggests that a retail-minus margin for a wholesale roaming access service should be substantial, taking into account the large component of avoided cost.

535. TUANZ noted that MTRs may not be appropriate benchmarks for a roaming service, primarily because the roaming user is as likely to be originating calls on the host network as to be receiving them, and therefore procedures must be in place for the origination and termination costs associated with such calls to be charged back to the account of the user's home network.

Commission's preliminary view

536. In terms of an appropriate pricing principle for a designated roaming service, the use of a retail-minus principle and a cost-based principle have been considered.

537. Under a retail-minus principle, the costs avoided by the access provider when supplying roaming as opposed to the retail service would be subtracted from a measure of retail price. This would determine a wholesale price for the roaming service, which should provide a sufficient margin to allow the access seeker to compete in the provision of retail services.

538. Such an approach has been supported in submissions by Telecom and TUANZ.

539. However, the Commission does not consider that a retail-minus pricing principle is appropriate for a designated roaming service. A key consideration in determining an appropriate price for the roaming service is how to incentivise an access seeker to efficiently deploy its own mobile network. Such a deployment will generally be promoted by an access price that reflects the costs of supplying the access service, and such an access price is unlikely to result from a retail-minus pricing principle.

540. For example, both Telecom and Vodafone have indicated that an efficient roaming price should increase over time, as the entrant initially covers low cost areas and subsequently incrementally expands into higher cost areas. As a result, the access seeker will require roaming on increasingly higher cost parts of the access provider's network. However, under a retail-minus principle, changes in the wholesale price will only reflect changes in either the retail price, or the avoided costs, rather than the cost of the underlying service. The Commission does not consider that a roaming service that is priced according to a retail-minus pricing principle would provide a facilities-based entrant with efficient signals for further investment in coverage.

541. If a cost-based initial pricing principle were to be used to set the roaming rate, a practical issue would be how to benchmark such a rate, as few jurisdictions appear to set cost-based national roaming prices.

542. A number of parties have submitted that MTRs could be used as a proxy for roaming rates, on the basis that similar network elements are used to provide both services. The main difference that would need to be taken into account is that whereas MTRs only relate to the termination of a call, a roaming call is likely to originate and/or terminate on the roamed network.

543. This difference between call termination and call roaming could be accommodated by using a mobile termination benchmark to establish the cost of roaming on a per leg basis. As long as the costs of originating a call are similar to the costs of terminating a call, a cost-based MTR could be used to approximate

the per leg cost of roaming. For example, if the cost of terminating a call on a mobile network is estimated to be 14 cpm, then where an access seeker's subscriber originates a call while roaming on the access provider's network, the roaming rate would be 14 cpm in the case where the receiving party is not roaming, or 28 cpm where the receiving party is roaming.

544. In the Issues Paper, the Commission noted that a possible disadvantage of cost-based roaming rates is that such prices may provide less incentives for access seekers to build and extent their own networks, as the access seeker could purchase capacity at cost from existing mobile network operators. The Commission noted that such concerns could be mitigated by setting the level of cost-based roaming at an appropriate level, or through non-price terms such as attaching a roll-out requirement to the roaming service. An alternative to a roll-out requirement could be to allow the roaming rate to increase over time.

545. Both Vodafone and Telecom have submitted that the roaming rate should be allowed to increase over time as entrants build out their networks from low cost/high traffic regions. According to both parties, the roaming price should vary to reflect the actual costs of those parts of the access provider's network over which the entrant's subscribers roam.

546. As discussed elsewhere, the Commission considers that a specific roll-out requirement (other than the initial threshold required to gain access to roaming) is not appropriate. In the absence of such a requirement, however, the Commission does acknowledge that there may be a risk that a single roaming rate fixed at a constant level may not adequately reflect the changing cost of supplying roaming as an entrant deploys its network over time. This will have implications both for the access provider, in terms of cost-recovery, and the access seeker, in terms of facing an appropriate build-buy incentive.

547. The Commission considers that a cost-based pricing principle is appropriate for a designated roaming service. The Commission notes that in implementing this pricing principle, both in terms of an initial pricing principle and a final pricing principle, it will be appropriate to consider ways in which to ensure that the roaming price reflects efficiently incurred costs of supplying the roaming service.

548. The Commission considers that the initial pricing principle for a designated roaming service should be obtained by benchmarking against mobile termination rates in comparable countries where a forward-looking cost-based pricing methodology is used. The Commission considers that such an approach would be appropriate given that similar network elements are involve in providing termination and roaming services.

549. The Commission considers that the final pricing principle for a designated roaming service should be TSLRIC.

9. Conclusion and Draft Recommendation

Conclusion

550. The Commission considers that competition in the markets for roaming on GSM networks and CDMA networks is limited.

551. The Commission considers that moving the roaming service from a specified to a designated service would result in a substantial reduction in the price of the service, compared to what would have otherwise have been offered by access providers not subject to regulation or regulatory pressure. The Commission concludes that the magnitude of this reduction is such that the likelihood of entry will be materially enhanced by regulation or an appropriate undertaking accepted by the Commission.

552. The Commission also considers that amending the non-price terms of the current specified roaming service is likely to better promote entry into the mobile services market and more likely to promote competition and best give effect to section 18 of the Act.

553. The Commission considers that the co-location service should remain a specified service. However, the Commission considers that it is appropriate for the Telecommunications Carriers Forum to make enhancements to the Co-location Code and the Master Co-location Agreement to cater for a dispute resolution mechanism for replacement costs as well as for apportioning the costs for co-location based on space utilisation.

554. In making a recommendation to the Minister, the Commission must make the recommendation that best gives effect to section 18 of the Act.

555. The Commission has considered the amended undertaking submitted by Vodafone as an alternative to regulation. The Commission considers that the amended undertaking is a marked improvement from the original undertaking submitted by Vodafone. However, the Commission considers that the amended undertaking in its current form is not likely to promote entry into the New Zealand mobile market and therefore would not best give effect to section 18 of the Act.

556. The Commission considers that the restriction of roaming to 2G networks and the exclusion of other technologies in the undertaking does not promote competition for the long-term benefit of end-users in telecommunications markets.

557. The Commission considers that there are likely to be overall benefits to end-users from having same technology competition in the mobile market and there should be no restrictions in the undertaking on who can access the service.

558. With regard to co-location, the Commission considers that costs should be apportioned on the basis of the number of antennas on the mast and use of floor space within equipment rooms. The Commission also considers that a dispute mechanism in the undertaking would be beneficial to resolve the issue around replacement costs for co-location.

559. The Commission does not consider that the amended Vodafone undertaking in its current form is likely to best give effect to section 18 of the Act. However, the Commission considers that if the concerns raised in this draft report regarding Vodafone's undertaking are sufficiently addressed, the Commission may consider accepting it as a suitable alternative to regulation.

Recommendation

560. The Commission recommends that the specified service of co-location on cellular transmission sites should not be added to the designated services contained in Part 2 of Schedule 1 of the Act,.

561. The Commission recommends that specified service of national roaming should be added to the designated services contained in subpart 1 of Part 2 of Schedule 1 of the Act.

562. The Commission also recommends that the national roaming service should be altered by amending:

- the description of the service;
- the applicable conditions;
- the description of access seekers:
- the description of access providers; and
- the description of the limits on the applicable access principles.

563. The Commission recommends that the Vodafone undertaking in its current form should not be accepted.

Detail of the proposed alteration and proposed addition

564. In accordance with clause 4(3)(a) and clause 11(3)(a) of Schedule 3 of the Act, the Commission's final report must include the detail of the proposed alteration and proposed addition.

565. The following table provides the Commission's overall proposed alterations and additions to Schedule 1 of the Act for the recommended designated service of national roaming. The Commission recommends that the current service description in Part 3 of Schedule 1 to the Act be removed and that the following be added to Part 2, Subpart 1 of Schedule 1 to the Act as a designated service.

National Mobile Roaming Service	
Description of service	A service that enables an end-user who subscribes to a network operator's (operator A's) service to use services that are provided by another network operator (operator B's) within the area where operator B has a mobile network, but which is outside the coverage of operator A's network.
Conditions:	All of the following
	(a) the access seeker must not already have an agreement that provides for national mobile roaming with any mobile network operator in New Zealand
	(b) there must be no separate determination (whether pending or existing) regarding roaming onto a network other than the network in respect of which the access seeker seeks access
	(c) the access seeker must have rolled-out a network that comprises 100 sites or covers no less than 10% of the population, whichever is lower
	(d) the networks of both the access seeker and the access provider must be technically compatible and be able to interconnect
	(e) access seekers with a total New Zealand mobile market share greater than 25% in the mobile services market cannot roam in New Zealand cities.
Access provider	Any person who operates a mobile network
Access seeker	A service provider who seeks access to the service
Access principles	The standard access principles set out in clause 5
Limits on access principles	The limits set out in clause 6 and additional limits, which must be set by taking the following matters into account:
	(a) whether the access provider has, for each relevant site within an area, sufficient available capacity to provide the service, taking into account its reasonable anticipated requirements for capacity at that site

	(b) all legal requirements and all existing contractual obligations that the access provider has with third parties
Initial pricing principle:	Benchmarking against mobile termination rates in comparable countries where a forward-looking cost-based pricing methodology is used
Final pricing principle	TSLRIC

DATED this 3rd day of August 2007

Dr Ross Patterson
Telecommunications Commissioner