



NAD

NUMBER ADMINISTRATION DEED

Long Term Numbering Plan Report

The long term forecast and development of the New Zealand Number Plan

May 2022

Table of Contents

Introduction	3
Methodology	4
Analysis – The Data	5
Key highlights	6
HOC Codes (011XN)	7
Overview	7
HOC Codes – what is and what isn't available for allocation	7
Priority Analysis	7
Extending the life of HOC Codes	8
Impact of merger and acquisition activity on consumption rate and availability of HOC Codes	8
Impact of implementation of the T-digit	8
Encourage operators to use current HOC range more efficiently	9
Reformatting of HOC Codes	9
Trigger events and potential solutions	10
Non-Geographic Codes (02XY)	13
Overview	13
Current status of Non-Geographic Service Codes	13
Priority Analysis	13
Extending the life of Non-Geographic Codes	14
Demand analysis and impact of number portability	14
Current rules require a high level of utilisation	14
Trigger events and potential solutions	15
Geographic Codes (03XY / 04XY / 06XY / 07XY / 09XY)	17
Overview	17
Current Status of Geographic Service Codes	17
Priority Analysis	18
Trigger events and potential solutions	18
The future for Geographic Numbers	20
Discussion on Nomadicity	20
Special Service Codes (01XY & 1XYZ)	22
Overview	22
Current Status	22
Priority Analysis	22
Trigger events and potential solutions	23
Personal Number Service Codes (070XYZ)	25
Overview	25
Current Status of Personal Number Service Codes	25

Priority Analysis	25
Premium Rate Service Codes (090 XYZ)	26
Overview	26
Current Status of Premium Rate Service Codes	26
Consumption Rate	26
Priority Analysis	26
Value Added Service Codes (08XY)	28
Overview	28
Current Status of Value Added Services	28
Priority Analysis	28
Nationwide Number Service Codes (50XY)	29
Overview	29
Current Status of Nation-Wide Numbers Service Codes	29
Priority Analysis	29
Service Provider Prefixes (05 XY)	31
Overview	31
Current Status of Service Provider Prefixes	31
Priority analysis	31
Trigger events and potential solutions	32
The Internet of Things and impact on numbering	34
The New Zealand Experience	34
Recommendation	34

Introduction

The purpose of the Long Term Plan Report (Report) is to provide a structure for the evolution of the New Zealand Numbering Plan over time.

This Report provides analysis of the Service Categories in the Number Register and seeks to identify any areas of concern.

Understanding the metrics contained within the Number Register will enable NAD members to make informed decisions on any potential issues that may arise in a specific category.

The data will assist NAD members to:

- Provide informed input on the future of numbering in New Zealand.
- Consider the evolution of numbering in their own long-term plans.
- Be prepared for the need to make any changes to a Service Category.
- Be informed of the stresses on the Numbering Plan and be able to take steps to avoid costly change.
- Rely on a preapproved evolutionary pathway for the Numbering Plan to provide industry with certainty and continuity of approach.

Methodology

This Report has been prepared based on analysis of data taken from the Number Register in May 2021 and has been reviewed by the NAD Numbering Sub Committee.

We have extracted the data from the Number Register and calculated the number of Spare and Protected blocks for each Service Category. We have also reviewed the information on Allocations and Relinquishments of Code Blocks since the Report was last prepared. This data has been used to make calculations on demand and capacity for each Service Category.

In instances where there has been no demand for allocations in a Service Category over the last five years, we have made a minimum assumption of 0.2 allocations/year.

In calculating demand, we have used only the Average Consumption¹ figure. Relinquishment data has not been taken into account in determining demand. Therefore, demand figures should be conservative.

The demand and capacity calculations are used to make an assessment of priority for each of the Service Categories.

We have used the following key to base our analysis on (Figure 1). This key is used to determine the priority level for establishing which Service Categories may need to be reviewed in terms of the availability of Code Blocks for allocation. It is the same key that has been used for the last two Reports.

The discourse of the analysis has been provided in order of priority rating – the highest priority Service Categories are discussed first.

Figure 1 - Priority rating key

	Very Low	Low	Med	High	Very High
Demand (allocations/yr)	2 or less	5 or less	5 - 10	10 - 25	25 +
Capacity (years spare capacity)	5 or less	10 or less	15 or less	25 or less	25 +

[capacity]	[demand]	Very Low	Low	Med	High	Very High
Very Low		Very Low	Low	Med	High	Very High
Low		Very Low	Low	Med	High	Very High
Med		Very Low	Low	Med	High	Very High
High		Very Low	Low	Med	High	Very High
Very High		Very Low	Low	Med	High	Very High

¹ Average Consumption = Number of Allocations in last 5 years / 5

Analysis – The Data

A summary of the current demand, capacity, and priority status for each of the Service Categories compared to those from the previous Long Term Number Plan is shown below in Table 1.

Table 1 - Summary of analysis

	Special Service (01XY)	Special Service (1XYZ)	Non-Geographic (02XY)	Personal (070XYZ)	Premium Rate (090XYZ)	Value Added (08XY)	HOC (011 XNT)	Nationwide (50XY)	Service Provider (05XY)	Geographic (03XY)	Geographic (04XY)	Geographic (06XY)	Geographic (07XY)	Geographic (09XY)
Priority increase / decrease from last report	same	same	same	same	same	same	decrease	same	same	same	decrease	decrease	decrease	decrease
Demand 2021 Analysis	VL	VL	VL	VL	VL	VL	VL	VL	VL	L	VL	VL	VL	VL
Capacity 2021 Analysis	VH	VH	H	VH	VH	VH	H	VH	VH	VH	VH	VH	VH	VH
Priority 2021 Analysis	Very Low	Very Low	Low	Very Low	Very Low	Very Low	Low	Very Low	Very Low	Low	Very Low	Very Low	Very Low	Very Low
Priority 2016 Analysis	Very Low	Very Low	Low	Very Low	Very Low	Very Low	High	Very Low	Very Low	Low	Low	Low	Low	Low
Demand 2016 Analysis	VL	VL	VL	VL	VL	VL	L	VL	VL	M	L	M	M	M
Capacity 2016 Analysis	VH	VH	H	VH	VH	VH	VL	VH	VH	VH	VH	VH	VH	VH

Key highlights

In reviewing the data, the key metric to be aware of is the priority rating for each Service Category.

The analysis so far shows that the priority ratings for each of the Service Categories has remained static or has decreased (lower risk) since the Report was last updated in 2016. All the Service Categories now have a low or very low priority rating.

There has been a decrease in demand for the following Service Categories: HOC (011XNT); and all the Geographic Service Codes.

HOC Codes were high priority in the last report; however, this has now changed to low, with seven codes being relinquished in the period 2016 – 2020, and the average allocations per year falling from 3.4 to 0.8.

We note that the implementation of the T-digit for HOC Codes came into to effect in March 2017. It is anticipated that the T-digit will extend the life of each HOC Code.

HOC Codes (011XN)

Overview

Hand Off Codes (HOC) are used in network, billing and other operational systems to identify varying call types that are routed between networks. They are used internally between networks, and do not form part of the dialling plan. HOC Codes are invisible to end users. HOC Codes are an essential component of network set up within the telecommunications industry.

These HOCs are used for number portability between networks and number migration within networks.

HOC Codes are in the format 011XNT, where 011X is the Code Block allocated for this service, N is the network identifier and T is the service identifier. HOC Coders are sub-allocated at the 011XN level.

The Numbering Plan allows for up to 10 HOC Code blocks (011X level), with 10 possible network identifiers (011XN level) – allowing for a total of 100 HOC Code combinations available for allocation. Not all 100 Code Blocks are available for allocation, and this is discussed in the section “HOC Codes – what is and what isn’t available for allocation”.

It is noted that the Numbering Rules permit the Management Committee to designate new X and T digits as required.

HOC Codes – what is and what isn’t available for allocation

Today there are 70 HOC Codes available for allocation in the Number Register.

Some of the 011X have been deemed as inappropriate as HOC Codes as the Codes are Assigned at an 01X level for active services within networks. This originally limited the number of HOC Codes to 60 possible Codes available for allocation. In 2012, as a response to a shortage of available HOC Codes, the NAD approved the use of 0111NT, following the relinquishment of the 0111 Code Block by Telecom.

There are 30 Code Blocks that remain unallocatable, (10 in each block), and do not currently exist in the Number Register. They are:

- 0110 – used within Spark for operator services for toll bar lines.
- 0113NT – used internally by Spark for migration between mobile platforms.
- 00117NT – used internally by Vodafone as a routing code.

Priority Analysis

In the previous report, the HOC Code Service Category had a high priority analysis of all the Service Categories, with only four years spare capacity. This has changed to low, with seven HOC Codes being relinquished in the past five years, whilst average allocations per year have fallen from 3.4 to 0.8. It is worth noting the efforts of Vodafone, who have relinquished three HOC codes in the past five years.

Of all the HOC Codes available for allocation there are 16 spare. Based on average consumption over the last five years there are 20 years left of HOC Codes left available for allocation (Table 2).

Table 2 - HOC Code data

	HOC (011 XNT)
# Possible code blocks	100
# Spare	16
# Unallocatable	30
% Spare	16%
% Spare (including unallocatable ranges)	46%
Average consumption (last 5 years)	0.8
Average relinquishments (last 5 years)	1.4
Net in/out flow	-0.6
Allocations/year	0.8
# Years left 2021 data	20
# Years left 2016 data	4

Extending the life of HOC Codes

Impact of merger and acquisition activity on consumption rate and availability of HOC Codes

Of all the Service Categories, the greatest impact of merger and acquisition activity in the marketplace has been on HOC Codes. The Number Administrator has completed additional analysis on the allocation of HOC Codes to ascertain how HOC Codes are distributed amongst industry participants.

Of the current available HOC Codes, 35% sit with two companies. Both companies have indicated that their long-term plans are to rationalise the use of their current allocations of HOC Codes with a view to relinquishing those Code Blocks that are no longer required as various network elements undergo redesign.

It is possible that the relinquishment of HOC Codes over the medium to long term may be sufficient to alleviate the pressure on this service category. Industry participants have noted that while the last few years have seen a flurry of entry into the New Zealand telecommunications market, the industry now appears to be going through a rationalisation period and we may witness a decline in entry and a consolidation of HOC Code requirements from industry participants.

Impact of implementation of the T-digit

Following on from the work on the Long Term Numbering Plan in 2014 the Number Rules were amended in mid-2016 to include a provision on the eligibility for allocation of HOC Codes². This new section requires that those applicants applying for new HOC Codes will not be eligible for further allocations of HOC Codes at the sub-allocated level (011XN) unless all available options within their existing HOC allocations have been exhausted.

² Telecommunications Number Plan – Number Allocation Rules v7.0, 23 May 2016, section 12.3

We note that from 1 March 2017, applicants must use all available T digits assigned for Local Number Portability and Mobile Number Portability (being T digits 7, 8 and 9. Figure 2 provides additional detail on the allocation of T digits. It is anticipated that the T-digit will extend the life of each HOC Code as the implementation of the T-digit will allow for an increase in the efficiency of the use of HOC Codes that are already allocated.

Figure 2 - Allocation of the HOC T digits

T Digit (Service identified)		
T Digit	Allocation	Condition
0	0ANXY numbers for geographic service	
1	Tollfree number portability	
2	02XYZ numbers for non-geographic service	
3	0800 numbers for Universal International Freephone Number Service Reserved for International Tollfree	
4	0867 numbers for Internet Access service	
5	0873 numbers for Internet Access service	
6	Not in Use	
7	LMNP HOC Carrier	
8	LMNP HOC Carrier	Not for use before 1/03/2017
9	LMNP HOC Carrier	Not for use before 1/03/2017

Encourage operators to use current HOC range more efficiently

In an effort to address the scarcity of geographic numbers in the UK, Ofcom introduced a pilot scheme in 2013 to charge communications providers for number in the 30 geographic area codes with the fewest number blocks remaining available for allocation.

In 2016 Ofcom reviewed the pilot scheme and has proposed that it continues to charge for geographic numbers in those area codes where scarcity is likely to be a concern in the near to medium-term future.³

This approach would require a rule change. It is interesting to note the mechanisms other jurisdictions have implemented that may be worth further consideration by the NAD.

Reformatting of HOC Codes

Currently HOC Codes are allocated at the 011XN level.

Should the need arise, it is possible that industry could look at reformatting the Service Category to increase the number of codes available by changing the leading 011 format.

Any change to the HOC Code format will have a network impact. The change that has the least impact is preferable. The 011 prefix of HOC Codes is fundamental to the current format; a change at this level is expected to have a significant network impact.

³ <https://www.ofcom.org.uk/consultations-and-statements/category-2/promoting-efficient-use-of-geographic-telephone-numbers>

New format – 1011XNT

It is possible that a new range of HOC Codes could be created using the format 1011XNT – creating a new range from the Special Service Category 1XYZ. This has the potential of doubling the number of HOC Codes in existence to 200 and having a significant impact on extending the life of the Service Category. The Code Block 1011 is currently Spare.

If technically feasible this change would have the benefit of potentially allowing the existing 011XNT Codes to continue without altering them. This solution would require networks to be able to activate a the new 1011XNT range and recognise it as a HOC Code.

Trigger events and potential solutions

The following table outlines trigger events and actions that should be taken as a result of the Service Category reaching the trigger event.

Stage	Trigger Event	Responsibility	Action Taken
1	Number of Spare Codes fall to <5 years capacity	Number Administrator/NAD Parties with HOC Codes	Number Administrator advises NAD Parties of the shortage and requests that HOC Codes are relinquished where technically and commercially reasonable, in accordance with the Rule 1.3.5 of the Rules. Parties assess the request in good faith and action as appropriate.
2	Number of Spare Codes fall to <4 years capacity	Number Administrator/NAD Parties with Special Services Codes 0110; 0113; 0117	Number Administrator advises NAD Parties of the shortage and requests that HOC Codes are relinquished where technically and commercially reasonable, in accordance with the Rule 1.3.5 of the Rules. Number Administrator advises NAD parties with Special Service Codes 0110, 0113, 0117 of the shortage and requests relinquishment of those Codes to create further HOC Codes. Parties assess the request in good faith and action as appropriate, including consideration of an exchange of Code Blocks within the Special Service Codes Service Category.
3	Special Service Codes 0110, 0113 or 0117 are relinquished	Number Administrator	Number Administrator uses the relinquished Codes to create new HOC Codes 0110N(T), 0113N(T) or 0117N(T) with the approval of the Management

			<p>Committee and advises the NAD Parties accordingly.</p> <p>New HOC Codes are not allocatable for a period determined by the Management Committee in order to allow NAD Parties time to implement network updates to acknowledge the new codes.</p>
4	Number of Spare Codes fall to <3 years capacity	Number Administrator/NAD Parties	<p>Number Administrator advises NAD Parties of the shortage and requests that HOC Codes and Special Service Codes 0110, 0113 or 0117 are relinquished where technically and commercially reasonable, in accordance with the Rule 1.3.5 of the Rules.</p> <p>NAD begins investigation into creating new HOC Codes out of existing ranges, with particular focus on using either Special Services Code Blocks 0138[N][T] and 0139[N][T] or other Service Provider Prefixes Codes to maintain the same HOC Codes length of 5 digits (plus a T digit).</p>
5	Number of Spare Codes fall to <2 years capacity	Number Administrator/NAD Parties	<p>Number Administrator advises NAD Parties of the shortage and requests that HOC Codes are relinquished where technically and commercially reasonable, in accordance with the Rule 1.3.5 of the Rules.</p> <p>Number Administrator advises NAD Parties of the imminent need to create a new range. Code Blocks in the range identified in step 4 are assigned as HOC Codes, and the Service Category is amended to include reference to the new range as supplementary to 011XNT.</p> <p>New HOC Codes are not allocatable for a period of 1 year from creation in order to allow NAD Parties time to implement network updates to acknowledge the new codes.</p>
6	Prior steps have failed to alleviate the shortage, or have	Number Administrator/NAD Parties	<p>Number Administrator advises NAD Parties of the shortage and the imminent need to create a new range. Parties are invited to relinquish Code</p>

	<p>been naturally exhausted</p>		<p>Blocks where technically and commercially reasonable, in accordance with the Rule 1.3.5 of the Rules.</p> <p>The NAD begins an investigation into amending the HOC Code length to account for a reform of HOC Codes with the addition of a Y digit.</p>
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Non-Geographic Codes (02XY)

Overview

Non-Geographic Service Codes are allocated for use as a prefix to end-user numbers for services without a geographic structure, which can originate or terminate calls over Public Switched Telecommunications Networks.

Services without a geographic structure include cellular, paging and similar services. For the most part, Non-Geographic Service Codes are used for mobile devices and are therefore very visible and well known to end users. Any change to their format and use will have an end user impact. Unlike Geographic Service Codes, which maintain a rigid 7-digit number structure, there is some in-built flexibility within the Non-Geographic Service Codes to alter number length between 10 and 11 digits.

Non-Geographic Service Codes are expected to have one of the highest levels of demand within the numbering plan in the future with the increase in popularity of mobile devices in the future; and the potential for a significant increase in demand for these numbers for M2M devices.

Current status of Non-Geographic Service Codes

The NAD Management Committee has previously had reason to look at the future of this Service Category and its ongoing development. As such, the Numbering Plan makes allowances for expansion routes and the possibility of instant change to create further Code Blocks with relatively little impact upon the NAD Parties or the remainder of the Numbering Plan.

Non-Geographic Service Codes are in the format 02XY or, at the Management Committee's discretion, 02XYZ. Therefore, the numbering plan currently makes theoretical allowance for anything up to 1,000 possible combinations that could be allocated to NAD Parties, with each Code Block capable of providing the relevant NAD party anywhere between 100,000 and 1,000,000 numbers for end users.

In reality however, the number of 02XYZ codes is limited and most Codes Blocks maintain a 02XY structure bringing the actual number of Codes Blocks down to a more modest 127. At the 02XY level, there are between 1,000,000 and 10,000,000 numbers available per Code Block.

Of the 127 Code Blocks currently listed on the Number Register, 30 are reserved for possible expansion for usage in the future, by resolution of the Management Committee. This limits the number of Code Blocks available for allocation to 97.

Priority Analysis

The Non-Geographic Code currently holds a low overall priority analysis. Based on a conservative estimate there are 20 years of Code Blocks available for allocation (Table 3).

In addition, the Number Register holds a large block of Protected Codes that have been set aside to deal with any potential requirement for Code Block expansion.

Table 3 - Non-Geographic Code data

	Non-Geo (02XY)
# Possible code blocks	127
# Spare	20
% Spare	16%
Average consumption (last 5 years)	1
Average relinquishments (last 5 years)	0
Net in/out flow	1
Allocations/year	1
# Years left 2021 data	20
# Years left 2016 data	16

Extending the life of Non-Geographic Codes

Demand analysis and impact of number portability

The demand analysis for Non-Geographic Codes has remained at very low since the study was last undertaken in 2016.

Historically the Non-Geographic Service Category has been extensively used, particularly with the entrance of a third carrier to the New Zealand market and the growth in MVNOs who have each had demand for Code Blocks for their own services. The mobile market has now matured in New Zealand with a market saturation of over 100%.

Number Portability provides the ability to retain your number while switching providers. This ability can naturally reduce the overall demand for numbers as new providers to the market can make use of porting to obtain market share without the need to have a large supply of numbers themselves obtained directly from the NAD.

Steps have been taken by the NAD to protect Code Blocks within this Service Category for future expansion.

Current rules require a high level of utilisation

Ideally, all Non-Geographic Code Blocks are as fully utilised as possible by those NAD parties that are allocated them. Because Non-Geographic numbers are not linked to location and can be allocated more freely than Geographic numbers, utilisation figures in these Code Blocks are expected to be quite high.

The NAD requires that, before another Code Block can be allocated, the relevant NAD Party has achieved a minimum of 40% utilisation within their existing Code Blocks.

Trigger events and potential solutions

The following table outlines trigger events and potential actions to be taken at such time that the event occurs.

Stage	Trigger Event	Responsibility	Action Taken
1	Number of Spare Codes fall to <5 years capacity	Number Administrator/NAD Parties with Non-Geographic s	<p>Number Administrator advises NAD Parties of the shortage and requests that Non-Geographic Service Codes are relinquished where technically and commercially reasonable, in accordance with the Rule 1.3.5 of the Rules.</p> <p>Parties assess the request in good faith and action as appropriate.</p> <p>Spare Code Blocks in the 02XY format are designated 02XYZ Code Blocks by the Management Committee at their discretion.</p> <p>The Number Administrator conducts a review of the additional recommended courses of action in this plan for this Service Category to ensure the proposal is still in keep with the recent developments in the Service Category.</p>
2	Number of Spare Codes fall to <3 years capacity	Number Administrator/NAD Parties	<p>Number Administrator advises NAD Parties of the shortage and requests that Non-Geographic Service Codes are relinquished where technically and commercially reasonable, in accordance with the Rule 1.3.5 of the Rules.</p> <p>If there are any additional Spare Code Blocks in the 02XY format, these are designated 02XYZ Code Blocks by the Management Committee at their discretion.</p> <p>The Management Committee additionally releases Protected Code Blocks as 02XYZ Code Blocks at their discretion.</p>
3	Number of Spare Codes fall to <2 years capacity	Number Administrator/NAD Parties	<p>Number Administrator advises NAD Parties of the shortage and requests that Non-Geographic Service Codes are relinquished where technically and</p>

			<p>commercially reasonable, in accordance with the Rule 1.3.5 of the Rules.</p> <p>The Management Committee releases Protected Code Blocks as 02XYZ Code Blocks at their discretion.</p> <p>Additionally, existing 02XYZ Code Blocks are designated 02XYZA Code Blocks and allocation sizes are reduced to 100,000 per Code Block.</p>
4	Prior steps have failed to alleviate the shortage, or have been naturally exhausted	Number Administrator/NAD Parties	<p>Number Administrator advises NAD Parties of the shortage and the imminent need to create a new range. Parties are invited to relinquish Code Blocks where technically and commercially reasonable, in accordance with the Rule 1.3.5 of the Rules.</p> <p>Code Blocks in the range 040 range are assigned as Non-Geographic Service Codes, and the Service Category is amended to include reference to the new range as supplementary to 02X.</p>

Geographic Codes (03XY / 04XY / 06XY / 07XY / 09XY)

Changes to the Geographic Service Category may be impacted by developments with the Non-Geographic Service Category, in which case the available options will need to be recast accordingly. The follow section presumes the on-going independence of the Geographic Service Code is maintained. For information on a potential future of this Service Category where Geographic and Non-Geographic numbers are more closely aligned, please see “The Future for Geographic Numbers”

Overview

Geographic Numbers are used for identifying services with a geographic structure, that are allocated to a Local Calling Area, and which can originate or terminate calls over Public Switched Telecommunications Networks. Geographic Code Blocks may be allocated for the provision of services which have the ability to be location independent from time-to-time, i.e. the physical location of the point of termination or origination of a call is not necessarily discernible from the telephone number alone.

The Geographic Service Codes are spread across five area codes, each with their own distinct consumption rates and spare capacity. Accordingly, this analysis adopts a general overview with each area code then considered in detail separately.

Spark assigns geographic number ranges on an ESA (Exchange Service Area) basis primarily based on historical copper centre for reasons of being the original provider of New Zealand telephone services when the service was run by the NZ Post Office. Other NZ NAD parties assign on an LCA (Local Calling Area) basis.

Current Status of Geographic Service Codes

Geographic Service Codes are in the format 0ANXY, where the area code A = {3, 4, 6, 7, 9} and digit N = {2, 3, 4, 5, 6, 7, 8, 9}. The number range 0A50Y is excluded from this Service Category and set aside as the Nation-Wide Numbers Service Category.

Within each area code, 911 and 999 are unallocatable due to the relationship to the internationally used Emergency Services numbers. This provides a total combination of 3,940 Code Blocks. It is important to note that as each Code Block is limited to its distinct area code, the total size of the pool of Code Blocks is misleading – if one area code is full, it is irrelevant if another is empty as the Code Blocks cannot be shared.

The most significant factor that must be considered in this Service Category is that, both locally and internationally, Geographic Service Codes naturally have extremely low utilisation rates within Code Blocks. As numbers are tied to geographic areas, some areas will have naturally low population densities resulting that the bulk of the numbers allocated are unused and cannot be recycled to other areas. It is common for utilisation levels to be around 20% internationally, with some countries and areas having utilisation rates even lower than this.

There are ways to naturally improve utilisation rates and the above assumptions cannot be taken as concrete assertions on the fate of the majority of numbers in this Service Category. However, for the purposes of this plan, it is important to consider that the total amount of numbers in each area code that could actually be used (i.e. before an applicant requires another code block) is likely to be significantly less than the total theoretical amount of numbers based on the structure of the numbering plan alone.

Priority Analysis

All the Geographic Codes obtained a low or very low priority analysis rating. This is a decrease from low which was the rating for all Geographic Codes in the 2016 Report. There may be a number of influences on this – number portability; increasing reliance on mobiles and the increased uptake of naked broadband⁴ products.

All the Geographic Codes have more than 25 years spare capacity, achieving a very high capacity rating. Demand for Geographic Codes is very low (2 or less allocations per year), except for the 03XY range, which has a low demand of 3.4 allocations per year (Table 4).

There is no immediate concern regarding capacity in any of the Geographic Codes. It will be interesting to note and keep a watching brief on the 09XY range, given Auckland’s growing population.

Table 4 - Geographic Codes data

	Geographic (03XY)	Geographic (04XY)	Geographic (06XY)	Geographic (07XY)	Geographic (09XY)
# Possible code blocks	1000	1000	1000	1000	1000
# Spare	200	397	399	421	263
% Spare	20%	40%	40%	42%	26%
Average consumption (last 5 years)	3.4	1.2	1.2	1.8	2
Average relinquishments (last 5 years)	5.8	4.4	4.8	5	3.2
Net in/out flow	-2.4	-3.2	-3.6	-3.2	-1.2
Allocations/year	3.4	1.2	1.2	1.8	2
# Years left 2021 data	59	331	333	234	132
# Years left 2016 data	22	100	61	63	37

Trigger events and potential solutions

The following table outlines trigger events and potential actions to be taken at such time that the event occurs.

Stage	Trigger Event	Responsibility	Action Taken
1	Number of Spare Codes fall to <7 years capacity	Number Administrator/NAD Parties with Geographic Numbers	Number Administrator advises NAD Parties of the shortage and requests that Geographic Numbers are relinquished where technically and commercially reasonable, in accordance with the Rule 1.3.5 of the Rules. Parties assess the request in good faith and action as appropriate.

⁴ A service where the fixed line connection to the house provides a data service only.

			<p>The Number Administrator conducts a review of the recommended courses of action in this plan for this Service Category to ensure the proposal is still in keep with the recent developments in the Service Category.</p>
2	Number of Spare Codes fall to <5 years capacity	Number Administrator/NAD Parties	<p>Number Administrator advises NAD Parties of the shortage and requests that Geographic Numbers are relinquished where technically and commercially reasonable, in accordance with the Rule 1.3.5 of the Rules.</p> <p>Protected Code Blocks are released for allocation at the Management Committee’s discretion.</p> <p>The allocation size of Spare Code Blocks is reduced from 10,000 to 1,000 numbers by allocating remaining Code Blocks at the OXYZB level.</p> <p>A study of the impacts of an overlay code or increase to 8 digit local numbers is implemented.</p>
3	Number of Spare Codes fall to <3 years capacity	Number Administrator/NAD Parties	<p>Number Administrator advises NAD Parties of the shortage and requests that Geographic Numbers are relinquished where technically and commercially reasonable, in accordance with the Rule 1.3.5 of the Rules.</p> <p>The NAD implements either a revised area code or increase to 8 digit local numbers is initiated in accordance with the prior study on the impacts of such a change.</p> <p>The implementation period of the reformatting is to be agreed between the NAD Parties, to be no shorter than 1 year.</p> <p>Newly created Geographic Numbers are not allocatable for a period of 1 year from creation in order to allow NAD Parties time to implement network updates to acknowledge the new codes</p>

			and to update customers and end users with details of the change.
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The future for Geographic Numbers

The future of geographic numbering is tied to the future of networks and the developments and changes in the way people use devices and their numbers.

An Ofcom *Future of Numbering* statement released in March 2022⁵ noted:

Maintaining landline phone area codes

We are keeping the existing rules on geographic numbering which allocate the first few digits of a landline phone number to an area (the area code) and provide location significance.

Although IP networks do not require area codes to route calls in the same way as legacy networks, and recognition of the geographic link between phone number and location is declining, it is still valued by some people and businesses. We have therefore decided not to remove this link.

These rules permit out-of-area use of geographic numbers which we consider provides an important degree of flexibility in number use for people and businesses.

The NAD recognises this global trend where the boundaries of Geographic and Non-Geographic numbers may cease to exist.

Discussion on Nomadcity

The NAD notes the increasing prevalence of services that make use of a geographic number whereby a geographic number may be used to both originate and terminate a service regardless of the geographic location.

For example:

- a capability whereby VoIP network customers can connect their CPE at any access point to the network and receive and originate calls to and from their own number, independent of their geographic location.
- an inherent capability of a VoIP network, unlike in the PSTN where the customer’s number is tied to their physical line circuit and any change in location can be achieved only through manual re-provisioning.

The NAD notes challenges that are raised by nomadic services. Issues include situations which may cause confusion for end users, for example, dialling an 03 number and expecting the call to terminate in the South Island, but the call terminates to a physical location in Auckland.

Also calls from nomad numbers to geographic based services would select the incorrect terminating point as the information used for call routing is the caller’s number without any actual geographic location context.

Issues may also arise in terms of a service providers obligations to deliver 111 emergency calls. Currently, TESSA (Telecom Emergency Service Support Application) performs a reverse look-up of the

⁵ https://www.ofcom.org.uk/data/assets/pdf_file/0024/233745/Future-of-Numbering-Statement-on-geographic-numbering.pdf

telephone directory, and relies on the fixed association between the caller's telephone number and their physical address. The derived address information is used when the caller is unable to provide sufficient details of their location to the emergency service. The NAD has flagged this issue to the Telecommunications Forum as a potential issue for the Emergency Services workstream to consider.

The NAD will maintain a watching brief on these and other issues associated with nomadic services as this report is updated.

Special Service Codes (01XY & 1XYZ)

Overview

Special Service Codes are allocated for identifying various telecommunications services that either:

- (a) provide information, assistance, or support to callers to enable them to have access to services, or to obtain assistance in using services, or
- (b) enable customers to control the status, activation, and other parameters of special services associated with their network connection or service type, or
- (c) are used by network operators for internal network routing or network management purposes – these codes are not normally dialable by customers.

Calls to 01XY codes may involve charges. Accordingly, some Special Service Codes are customer facing (such as 018 Directory Assistance) and some are not. Special Service Codes can be visible to end users and changes may have impact upon an end user, but the impact is predicted to be small given the little day-to-day contact an end user has with these codes. Given their importance in networks and between networks, (including as HOC Codes, a subset of this number range), these numbers are core to the operation of the telecommunications industry.

Calls to 1XYZ codes generally do not involve charges to the caller (unlike the 01XY range). In all other respects the 1XYZ range is identical to the 01XY range at a Number Administration level. Special Service Codes can be visible to end users and changes may have impact upon an end user, but the impact is predicted to be smaller than those categories which are entirely end user facing (such as Geographic Codes).

Current Status

The same rate of consumption that drives demand in Geographic and Non-Geographic Service Categories for example does not exist in the Special Service Code Category. Rates of consumption in this category are historically low and remain so.

The consumption rate in these Special Service Categories is very low; there have been six allocations in the last five years.

Priority Analysis

The Special Service Categories currently hold a very low overall priority analysis. There is very little current demand on either of these Service Categories. Based on a conservative estimate there are 90 – 296 years of Code Blocks available for allocation (Table 5).

Table 5 - Special Service Code data

	Special Service (01XY)	Special Service (1XYZ)
# Possible code blocks	100	1000
# Spare	18	237
% Spare	18%	24%
Average Consumption (last 5 years)	0	0.8
Average relinquishments (last 5 years)	0.8	0.4
Net in/out flow	-0.8	0.4
Allocations/year with minimum assumption	0.2	0.8
# Years left 2021 data	90	296
# Years left 2016 data	80	1,245

Trigger events and potential solutions

The need to intervene in this Service Category is extremely low. Previous Long Term Number Plan reports have noted the following trigger events and potential solutions. They are noted here for prosperity.

Stage	Trigger Event	Responsibility	Action Taken
1	Number of Spare Codes fall to <5 years capacity	Number Administrator/NAD Parties with Special Service Codes	<p>Number Administrator advises NAD Parties of the shortage and requests that Special Service Codes are relinquished where technically and commercially reasonable, in accordance with the Rule 1.3.5 of the Rules.</p> <p>Parties assess the request in good faith and action as appropriate.</p> <p>The Number Administrator conducts a review of the recommended courses of action in this plan for this Service Category to ensure the proposal is still in keep with the recent developments in the Service Category.</p>
2	Number of Spare Codes fall to <4 years capacity	Number Administrator/NAD Parties with Special Services Codes allocated at 01X	Number Administrator advises NAD Parties of the shortage and requests that Special Service Codes are relinquished where technically and commercially reasonable, in accordance with the Rule 1.3.5 of the Rules.

			Parties assess the request in good faith and action as appropriate, including consideration of an exchange of Code Blocks within the Special Service Codes Service Category.
3	Number of Spare Codes fall to <3 years capacity	Number Administrator/NAD Parties	<p>Number Administrator advises NAD Parties of the shortage and requests that Special Services Codes are relinquished where technically and commercially reasonable, in accordance with the Rule 1.3.5 of the Rules.</p> <p>Number Administrator makes an assessment of the ability to reformat the number range and works with industry to implement.</p>
5	Number of Spare Codes fall to <2 years capacity	Number Administrator/NAD Parties	Number Administrator advises NAD Parties of the shortage and requests that Special Services Codes are relinquished where technically and commercially reasonable, in accordance with the Rule 1.3.5 of the Rules.
6	Prior steps have failed to alleviate the shortage, or have been naturally exhausted	Number Administrator/NAD Parties	<p>Number Administrator advises NAD Parties of the shortage and the imminent need to create a new range. Parties are invited to relinquish Code Blocks where technically and commercially reasonable, in accordance with the Rule 1.3.5 of the Rules.</p> <p>Code Blocks in the range [0139, 0138] are assigned as Special Service Codes, and the Service Category is amended to include reference to the new range as supplementary to 01XY.</p>

Personal Number Service Codes (070XYZ)

Overview

Personal Numbers are used for identifying Personal Number Services. These codes do not designate, by themselves or in conjunction with other digits, call answering points.

The attributes of Personal Number Services will allow the customer to have unique number associated with them which is independent of any network termination or location. Personal Numbers are visible to end users, and any change to their format and use will have an end user impact.

Current Status of Personal Number Service Codes

Personal Numbers are in the format 070XYZ. There are currently 1,000 possible combinations available for allocation.

500 070XYZ code blocks are reserved, by resolution of the Management Committee, for possible expansion for 070 usage in the future. This limits the number of allocatable codes to a more modest 500 code blocks. Of these Code Blocks 98% are listed as Spare. Given the significant amount of Spare capacity in this Service Category and the low consumption rate, the Personal Number Service Category is a range that could be used for other Service Categories to expand in to in the future.

The future of this Service Category may be more dependent upon how it is used as a path for expansion, and less on the consumption of Personal Number Services themselves.

Priority Analysis

The Personal Number Service category holds a very low overall priority analysis. There has been no consumption of Code Blocks in this Service Category in the last five years.

Based on a conservative estimate there is 2,445 years of Code Blocks available for allocation (Table 6).

Table 6 - Personal Number Service data

	Personal (070XYZ)
# Possible code blocks	500
# Spare	489
% Spare	98%
Average consumption (last 5 years)	0
Average relinquishments (last 5 years)	0.2
Net in/out flow	-0.2
Allocations/year with minimum assumption	0.2
# Years left 2021 data	2,445
# Years left 2016 data	2,445

Premium Rate Service Codes (090 XYZ)

Overview

Premium Rate Service Codes are allocated for identifying premium rate services. Premium Rate Service Codes are visible to end users and well known.

Currently, only two providers have allocations of premium rate numbers and there is little demand in this service category which reduces the pressure on the Service Category for new capacity. There is nothing to indicate that the demand for these services will increase in the future.

Current Status of Premium Rate Service Codes

Premium Rate Service Codes are currently allocated at the 090XYZ level. The ranges 0906-0909 are currently protected for 090 usage in the future. There are 1,000 code blocks in this range available for allocation.

The total length of numbers using these Code Blocks is between 9 and 11 digits (090XYZ + 3 digits or 090XYZ + 5 digits). Accordingly, each allocation of numbers has between 1,000 and 100,000 potential Codes for assigning to end users, depending upon the needs and desires of the relevant NAD party.

Of the 600 Code Blocks in the currently allocatable 0901-0905 ranges, only 104 are allocated. This leaves 496 Code Blocks or 82% spare capacity. If the additional 400 Code Blocks that are released for allocation at any time, the number of Spare Code Blocks will increase to 896 Code Blocks or 89% spare capacity in the entire Service Category.

Consumption Rate

The rate of consumption in this category is very low. There have been no allocations in this service category in the last five years.

The code blocks in the 0900 range are fully allocated and there is no current demand for any other Code Block.

Priority Analysis

The Premium Number Service Code category holds a very low overall priority analysis. There has been no consumption of Code Blocks in this Service Category in the last five years. Based on a conservative estimate there is 2,480 years of Code Blocks available for allocation (Table 7).

Table 7 - Premium Rate Service Code data

	Prem Rate (090 XYZ)
# Possible code blocks	1000
# Spare	496
% Spare	50%
Average consumption (last 5 years)	0
Average relinquishments (last 5 years)	0
Net in/out flow	0
Allocations/year with minimum assumption	0.2
# Years left 2021 data	2,480
# Years left 2016 data	2,480

Value Added Service Codes (08XY)

Overview

Value Added Services are used by end users for selecting a service provider's value added services, for example, conferencing, virtual private networks, mail box platforms and packet switching.

Demand is not significant with an average consumption rate over the last five years of 0.2 allocations/year.

Current Status of Value Added Services

Value Added Services are in the format 08XY but exclude the ranges 0800-0809 which are designated as Free Phone numbers. The range 0888 is currently noted as a potential expansion path for the Freephone Service Category and is therefore not able to be used for Value Added Services. The Numbering Plan currently makes allowance for up to 90 possible combinations that could be allocated to NAD Parties in this Service Category.

Of the 90 total blocks that exist in this Service Category, 10 are Protected by resolution of the Management Committee for the purposes of future expansion. Of the 80 remaining blocks, 39 (49%) are Spare.

Priority Analysis

The Value Added Service Codes category holds a very low overall priority analysis. Based on a conservative estimate there is 195 years of Code Blocks available for allocation (Table 8).

Table 8 - Value Added Service Codes data

	Value Add (08XY)
# Possible code blocks	80
# Spare	39
# Protected	
% Spare	49%
% Spare (including protected ranges)	
Average consumption (last 5 years)	0.2
Average relinquishments (last 5 years)	0.6
Net in/out flow	-0.4
Allocations/year with minimum assumption	0.2
# Years left 2021 data	195
# Years left 2016 data	67

Nationwide Number Service Codes (50XY)

Overview

Nationwide Numbers are used for identifying services without a geographic structure that can originate or terminate calls over a Public Switched Telecommunications Network.

Code Blocks from this Service Category are intended to be used for services that are not linked to a specific area code or Local Calling Area. Calls to these numbers may incur a charge, dependent on the originating service provider.

The number format is unique to this Service Category. Nationwide Numbers are visible to end users, and any change to their format and use will have an end user impact. Nationwide Numbers have a very low level of demand.

Current Status of Nation-Wide Numbers Service Codes

Nationwide Numbers are in the format 50XY. The numbering plan currently makes allowance for up to 100 possible combinations that could be allocated to NAD Parties. Of these Codes, 93% are listed as Spare. There have been no new allocations in this Service Category in the last five years.

Given the very low consumption rate, the future of this Service Category may be more dependent upon how it is used as a path for expansion or for new types of services, and less on the consumption of Nation-Wide Numbers Services. This is especially true if the Service Category were reformatted to create more Code Blocks than the current 100 options.

Priority Analysis

The Nationwide Number Service Code category holds a very low overall priority analysis.

There has been no consumption of Code Blocks in this Service Category in the last five years. Based on a conservative estimate there is 465 years of Code Blocks available for allocation (Table 9).

Table 9 - Nationwide Number Service Code data

	Nationwide (50XY)
# Possible code blocks	100
# Spare	93
# Protected	
% Spare	93%
% Spare (including protected ranges)	
Average consumption (last 5 years)	0
Average relinquishments (last 5 years)	0.2
Net in/out flow	-0.2
Allocations/year with minimum assumption	0.2
# Years left 2021 data	465
# Years left 2016 data	465

Service Provider Prefixes (05 XY)

Overview

Service Provider Prefixes are used by end users for selecting a Service Provider for the routing of calls.

Though previously allocated in substantial numbers, there has been a marked decline in the number of allocations in this Service Category in recent years.

Current Status of Service Provider Prefixes

Service Provider Prefixes are in the format 05XY or 05XYZ. There are 100 possible combinations available for allocation.

The majority of Code Blocks are still in the 05XY format which limits the currently available 05XYZ level Code Blocks and in turn, the potential to maximise the number of allocations in this Service Category. The NAD Management Committee may designate 05XYZ Code Blocks at any time.

Ten 05XY Code Blocks are reserved for possible expansion in the future, by resolution of the Management Committee, and this would result in an additional 100+ Code Blocks that could be created from these protected numbers. Of the Code Blocks currently nominated by the Management Committee as either 05XY or 05XYZ that could be allocated to an applicant, 39% are listed as Spare.

The future of this Service Category is dependent upon the demand for Service Provider Prefixes. If the decrease in demand continues, this Service Category may be more useful as a path for other Service Categories to expand into than a standalone Service Category.

Priority analysis

The priority analysis in this service category is very low. Demand is very low and capacity is very high. Based on the current consumption rate there are 195 years left of Code Blocks available for allocation (Table 10).

Table 10 - Service Provider Prefixes data

	Service Provider (05 XY)
# Possible code blocks	100
# Spare	39
% Spare	39%
Average consumption (last 5 years)	0
Average relinquishments (last 5 years)	2
Net in/out flow	-2
Allocations/year with minimum assumption	0.2
# Years left 2021 data	195
# Years left 2016 data	41

Trigger events and potential solutions

The need to intervene in this Service Category is extremely low. Previous Long Term Number Plan reports have noted the following trigger events and potential solutions. They are noted here for prosperity.

Stage	Trigger Event	Responsibility	Action Taken
1	Number of Spare Codes fall to <5 years capacity	Number Administrator/NAD Parties with Service Provider Prefixes	<p>Number Administrator advises NAD Parties of the shortage and requests that Service Provider Prefixes are relinquished where technically and commercially reasonable, in accordance with the Rule 1.3.5 of the Rules.</p> <p>Parties assess the request in good faith and action as appropriate.</p> <p>The Number Administrator works with industry to assess the potential for reformatting the number range.</p>
2	Number of Spare Codes fall to <3 years capacity	Number Administrator/NAD Parties	Number Administrator advises NAD Parties of the shortage and requests that Service Provider Prefixes are relinquished where technically and commercially reasonable, in accordance with the Rule 1.3.5 of the Rules.

			All Spare Code Blocks are designated 05XYZ Codes by the Management Committee.
3	Number of Spare Codes fall to <2 years capacity	Number Administrator/NAD Parties	Number Administrator advises NAD Parties of the shortage and requests that Service Provider Prefixes are relinquished where technically and commercially reasonable, in accordance with the Rule 1.3.5 of the Rules.
4	Number of Spare Codes fall to <1 years capacity	Number Administrator/NAD Parties	Number Administrator advises NAD Parties of the shortage and requests that Service Provider Prefixes are relinquished where technically and commercially reasonable, in accordance with the Rule 1.3.5 of the Rules.

The Internet of Things and impact on numbering

The term IoT or Internet of Things encompasses every object or thing connected to the internet. From sensors to smartphones to vehicles to entire buildings, IoT is made up of connected devices that “talk” to each other while collecting useful information that isn't available otherwise.

By combining IoT with automated systems, businesses can now gather and analyse data like never before. IoT could help your business reduce costs, improve health and safety, save time on monitoring and reporting, increase efficiency and return on investment. And this is all possible not someday, but today.⁶

The New Zealand Experience

In order for IOT devices to connect to a telecommunications data network they currently require a SIM and a number to be allocated to that SIM.

In New Zealand IOT services are currently offered over the Non-Geographic and Value Added Services Service Categories.

Recommendation

This is a growing area and one that the NAD will keep a watching brief on developments via the NAD Numbering Sub Committee.

Technological advancements may mean that the requirement for IOT number ranges may be superseded by IP addresses in the future as these services become available over IP networks.

It is unclear at this point in time if the availability of IOT numbers for IOT purposes will be an issue. It is recommended that the NAD takes a wait-and-see approach on this issue and review the information IOT communications whenever this report is updated.

⁶ <https://www.spark.co.nz/iot/home.html>