



NAD

NUMBER ADMINISTRATION DEED

Long Term Numbering Plan Report

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

August 2017

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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 have the opportunity 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 August 2016.

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 5 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. 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.

	Very Low	Low	Med	High	Very High	
Demand (allocations/year)	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 +	
	Very Low	Low	Med	High	Very High	[demand]
Very Low	Yellow	Orange	Orange	Red	Red	
Low	Yellow	Yellow	Orange	Orange	Red	
Med	Green	Yellow	Yellow	Orange	Orange	
High	Green	Green	Yellow	Yellow	Orange	
Very High	Blue	Green	Green	Yellow	Yellow	
[capacity]						

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

Analysis – The Data

	Special Service (01XY)	Special Service (1XYZ)	Non-Geo (02XY)	Personal (070XYZ)	Prem Rate (090 XYZ)	Value Add (08XY)	HOC (011 XNT)	Nationwide (50XY)	Service Provider (05 XY)	Geo (03XY)	Geo (04XY)	Geo (06XY)	Geo (07XY)	Geo (09XY)
Priority increase / decrease	decrease	decrease	same	same	same	decrease	same	same	same	decrease	same	decrease	decrease	decrease
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
Priority 2016 Analysis	Very Low	Very Low	Low	Very Low	Very Low	Very Low	High	Very Low	Very Low	Low	Low	Low	Low	Low
Priority 2014 Analysis	Medium	Low	Low	Very Low	Very Low	Low	High	Very Low	Very Low	Medium	Low	Medium	Medium	Medium
Demand 2014 Analysis	VL	M	L	VL	VL	VL	M	VL	VL	H	M	H	H	H
Capacity 2014 Analysis	L	VH	VH	VH	VH	H	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.

There has been a decrease in demand for the following Service Categories: Special Service (1XYZ); Non-Geographic (02XY); HOC (011XNT); and most of the Geographic Service Codes.

During the course of this calendar year, there has been a concerted effort to clean up the Number Register and release any reserved Code Blocks that have passed their reservation expiry date.

HOC Codes remain the highest priority. Demand for HOC Codes has decreased since the 2014, but capacity remains very low. 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 “Unallocatable HOC Codes”.

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

HOC Codes – what is an 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.

Of all the HOC Codes available for allocation there are 13 spare. NOTE: This does not include the now allowed usage of T digit 8. Including T digit 8 would give an additional 61 spare (including only 4 in the 0119 range). Based on average consumption over the last 5 years there are only 4 years left of HOC Codes left available for allocation.

Priority Analysis

The HOC Code Service Category has the highest priority analysis of all the Service Categories.

There has been a slight decrease in demand for HOC Codes, however capacity remains very low.

At the currently allocation rate there are only 4 years left of available HOC Codes

Table 1 – HOC Code Data

	HOC (011 XNT)
# poss Code Blocks	100
# Spare	16
# Unallocatable	30
% Spare	16%
% Spare (including unallocatable ranges)	43%
Avg Consumption (last 5yrs)	3.4
Avg RQ(last 5 years)*	0.8
Net in/out flow	2.6
Allocations/yr	3.4
# years left 2016 data	4
# years left 2014 data	3

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 in to 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.

We note that the implementation of the T-digit of 8 for HOC Codes comes in to effect in March 2017. 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.

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.

Ofcom recently 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.

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.

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.

Recommendations

It is recommended that the Number Administrator annually review the availability of HOC Codes at the end of each calendar year to more closely track the priority rating of this Service Category.

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

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	<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>Parties assess the request in good faith and action as appropriate.</p>
2	Number of Spare Codes fall to <4 years capacity	Number Administrator/NAD Parties with Special Services Codes 0110; 0113; 0117	<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 with Special Service Codes 0110, 0113, 0117 of the shortage and requests relinquishment of those Codes to create further HOC Codes.</p> <p>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.</p>
3	Special Service Codes 0110, 0113 or 0117 are relinquished	Number Administrator	<p>Number Administrator uses the relinquished Codes to create new HOC Codes 0110N(T), 0113N(T) or 0117N(T) with the approval of the Management 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 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>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>

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 reasons 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 in 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 priority analysis rating. This is a decrease from medium which was the rating for all Geographic Codes (except 04XY – which was low) in the 2014 Report. There may be a number of influences on this – number portability; increasing reliance on mobiles and the increased uptake of naked broadband³ products.

All Geographic Codes have spare capacity of greater than 25 years, which achieves a very high capacity rating. Demand for all Geographic Codes except 04XY is medium (5-10 allocations/year); 04XY achieved a low rating for demand (5 or less allocations/year).

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 2 – Geographic Code Data

	Geographic (03XY)	Geographic (04XY)	Geographic (06XY)	Geographic (07XY)	Geographic (09XY)
# poss Code Blocks	1000	1000	1000	1000	1000
# Spare	215	401	405	430	271
% Spare	22%	40%	41%	43%	27%
Avg Consumption (last 5yrs)	9.8	4	6.6	6.8	7.4
Avg RQ(last 5 years)*	15.8	9.4	11.8	18.2	5.4
Net in/out flow	-6	-5.4	-5.2	-11.4	2
Allocations/yr	9.8	4	6.6	6.8	7.4
# years left 2016 data	22	100	61	63	37
# years left 2014 data	32	78	55	55	32

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.

³ 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 OAXYZB 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 and to update customers and end users with details of the change.</p>

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.

In November 2012, the European Communications Office (ECO) produced a Green Paper on Long Term Evolution in Numbering, Naming and Addressing 2012-2022. This paper attempts to provide a vision in the area of numbering, naming and addressing up to the year 2022, being a 10 year vision and strategic plan on the development of numbering, naming and addressing.

The paper notes that the overall trend where users prefer mobile terminals over fixed line is likely to continue. Convergence between applications and technologies means more mobility will be possible resulting in an increase in demand for mobile numbers compared to a shrinking demand for geographic numbers for traditional fixed line services over time.

The report makes a broad prediction that fixed line services (and numbers) will only be taken as part of bundles with data connections for a growing majority, and will have little value in and of themselves for new users. This matches trends in growing competition in some jurisdictions in the prepaid or post-paid mobile market by companies entirely absent in fixed line calling.

The ECO paper recommends public authorities review the national numbering plans to adapt them according to the changing market needs, i.e. ensure there is a sufficient supply of non-geographic numbers available for the future. This is the current focus of Sweden and Denmark for example, who are finding that the pressure on their Non-Geographic or Mobile ranges far exceed the pressures on Geographic numbers.

There is a growing interest in cross portability, i.e. porting mobile numbers to fixed lines and vice versa, which is already available in some jurisdictions. This approach, of making all Geographic ranges mobile, makes enabling such cross portability possible for the future. Some New Zealand Non-Geographic numbers are already used (for IP services) for “non-cellular” services that are closer to local services than to mobile services. This could be considered the start of cross-portability if such numbers could then be ported to a cellular mobile service.

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 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.

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 16 years of Code Blocks available for allocation.

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)
# poss Code Blocks	127
# Spare	25
% Spare	20%
Avg Consumption (last 5yrs)	1.6
Avg RQ(last 5 years)*	0.4
Net in/out flow	1.2
Allocations/yr	1.6
# years left 2016 data	16
# years left 2014 data	25

Extending the life of Non-Geographic Codes

Demand analysis and impact of number portability

The demand analysis for Non-Geographic Codes has slowed since this report was last produced. It has fallen from Low to Very Low since the study was last undertaken in 2014.

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 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>

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 has been one allocation in the last 5 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 80 – 1,245 years of Code Blocks available for allocation.

Table 4 – Special Service Code data

	Special Service (01XY)	Special Service (1XYZ)
# poss Code Blocks	100	1000
# Spare*	16	249
% Spare	16%	25%
Avg Consumption (last 5yrs)	0	0.2
Avg RQ(last 5 years)	0.2	1.6
Net in/out flow	-0.2	-1.4
Allocations/yr w Min Assumption	0.2	0.2
# years left 2016 data	80	1,245
# years left 2014 data	14	47

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	<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, including consideration of an exchange of Code Blocks within the Special Service Codes Service Category.</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 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	<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>
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 5 years.

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

Table 5 – Personal Number Service Data

	Personal (070XYZ)
# poss Code Blocks	500
# Spare*	489
% Spare	98%
Avg Consumption (last 5yrs)*	0
Avg RQ(last 5 years)*	0.4
Net in/out flow	-0.4
Allocations/yr w Min Assumption	0.2
# years left 2016 data	2,445
# years left 2014 data	489

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 5 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 5 years. Based on a conservative estimate there is 2,480 years of Code Blocks available for allocation.

Table 6 – Premium Rate Service Code data

	Prem Rate (090 XYZ)
# poss Code Blocks	1000
# Spare	496
% Spare	50%
Avg Consumption (last 5yrs)*	0

Avg RQ(last 5 years)*	0
Net in/out flow	0
Allocations/yr w Min Assumption	0.2
# years left 2016 data	2,480
# years left 2014 data	896

Value Add 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 5 years of 0.6 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, 40 (50%) are Spare.

Priority Analysis

The Value Add Service Codes category holds a very low overall priority analysis. Based on a conservative estimate there is 2,480 years of Code Blocks available for allocation.

Table 7 – Value Add Service Codes data

	Value Add (08XY)
# poss Code Blocks	80
# Spare*	40
# Protected	
% Spare	50%
% Spare (including protected ranges)	
Avg Consumption (last 5yrs)*	0.6
Avg RQ(last 5 years)*	1.2
Net in/out flow	-0.6
Allocations/yr w Min Assumption	0.6
# years left 2016 data	67
# years left 2014 data	23

Nation-Wide Number Service Codes (50XY)

Overview

Nation-Wide 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. Nation-Wide Numbers are visible to end users, and any change to their format and use will have an end user impact. Nation-Wide Numbers have a very low level of demand.

Current Status of Nation-Wide Numbers Service Codes

Nation-Wide 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 Nation-Wide 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 5 years. Based on a conservative estimate there is 465 years of Code Blocks available for allocation.

Table xx – Nation-Wide Number Service Code data

	Nationwide (50XY)
# poss Code Blocks	100
# Spare*	93
# Protected	
% Spare	93%
% Spare (including protected ranges)	
Avg Consumption (last 5yrs)*	0
Avg RQ(last 5 years)*	0.4
Net in/out flow	-0.4
Allocations/yr w Min Assumption	0.2
# 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 1,000 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 100+ Code Blocks 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, 33% 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 low and capacity is high. Based on the current consumption rate there are 41 years left of Code Blocks available for allocation.

Table 8 – Service Provider Prefixes data

	Service Provider (05 XY)
# poss Code Blocks	100
# Spare*	33
% Spare	33%
Avg Consumption (last 5yrs)*	0.8
Avg RQ(last 5 years)*	2
Net in/out flow	-1.2
Allocations/yr w Min Assumption	0.8
# years left 2016 data	41
# years left 2014 data	76

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

A new machine-to-machine range?

Machine to Machine (M2M) describes communications between autonomous terminals that transmit data between themselves, without human intervention. These may be probes deployed to monitor the weather, smart meters deployed in homes to monitor power usage, or vending machines reporting stock levels and sales to a central database. With the advent of smart appliances, M2M now describes mass communications between “things.”

This form of numbering remains the largest potential source of demand for numbers in the future. There are varying views of when that demand will truly start to be felt however. Some reports predict M2M connections will number anywhere between 12 and 50 billion by 2020, however, similar astronomical claims were predicted for VOIP telephony at the turn of the century. VOIP is only now starting to hit levels predicted and still has a long way to go to completely replace traditional fixed line calling. M2M will invariably reach the 50 billion connections predicted, but perhaps not by 2020.

Most international administrations have adopted a wait and see approach before they leap into solutions for M2M. With the European e-Call and smart metering directives now coming into their own, some countries are now making moves to address M2M numbering and ensure their numbering plans are equipped to deal with what could be a large demand for numbers, all with common needs.

In most countries that have been investigated, M2M connections use Non-Geographic numbers at present. Assuming forecasts are accurate, this practice will soon rapidly exhaust their Non-Geographic ranges so the practice is unsustainable in the long term. Importantly, not all M2M connections are possible over mobile technology. Mobile coverage is not ubiquitous, and many smart meters will be hidden behind barriers where coverage falls dramatically. M2M services are data only, they will never transmit voice, so using numbers tied to voice services may not be ideal in the longterm.

In an attempt to resolve these issues some administrations have introduced long (13 digit) numbers that will permit M2M connectivity and that cannot be used for voice. It is anticipated by the European Communications Office that over the air updating of SIM details will permit devices to be updated and the numbers ported without having to replace all the SIMs in each unit in the future. This is called “soft-SIMs” where the SIM stops being a physical piece of plastic and is merely a piece of software on a device, able to be updated and changed like any other piece of software in need of an update. Some network operators in the EU have expressed some apprehension about introducing or relying on over the air updates to SIMs though, so the future of this area is uncertain.

The New Zealand Experience

There is no firm data available on New Zealand’s M2M market, but M2M services are currently offered over the Non-Geographic and Value Added Services Service Categories. Demand for these numbers remains relatively small and there is no current predicted surge of demand in New Zealand for M2M services. While the majority of countries are adopting a wait and see approach to M2M ranges, New Zealand should be safe to do the same for the foreseeable future.

Recommendation

Technological advancements may mean that the requirement for M2M number ranges will 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 M2M numbers for M2M purposes will be an issue. It is recommended that the NAD takes a wait-and-see approach on this issue and review the information on machine to machine communications when this report is update.