Telecom Regulatory Authority of India

Consultation Paper

on

Developing a unified numbering plan for fixed line and mobile services

New Delhi

20.09.2019

Telecom Regulatory Authority of India
Mahanagar Door Sanchar Bhawan
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Stakeholders are requested to furnish their comments to the Pr. Advisor (NSL), TRAI by 21.10.2019 and counter comments by 04.11.2017. Comments and counter comments would be posted on TRAI's website www.trai.gov.in. The comments/counter comments may be sent preferably in electronic form to Shri U.K. Srivastava, Pr. Advisor (Networks, Spectrum & Licensing), Telecom Regulatory Authority of India on the e-mail pradvnsl@trai.gov.in with a copy to rksingh@trai.gov.in.

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CHAPTER-I

Introduction

1.1 Telecommunications sector has been undergoing a transformation triggered by emergence of new network architectures and services. Advancement in telecommunications technology has brought about possibilities of new revenue streams for operators and better, faster and cheaper services for the consumer. It is becoming increasingly possible to deliver any service on any device, anytime, anywhere. To achieve this ubiquity, an often-overlooked resource, the number resource, is used to uniquely identify and differentiate among the end users.

1.2 The Department of Telecommunications administers numbers for fixed and the mobile networks based on the ITU's Telecommunication Standardization Sector (ITU-T) Recommendations. The ITU-T develops international standards known as ITU-T Recommendations which act as defining elements in the global infrastructure of information and communication technologies (ICTs). The Series E of ITU-T Recommendations deal with "Overall network operation, telephone service, service operation and human factors". Specifically, the Recommendation E.164 describes "The international public telecommunication numbering plan". This Recommendation provides the number structure and functionality of numbers used for international public telecommunication. It details the components of the numbering structure and the digit analysis required to successfully route the calls.

1.3 Management of numbering resources is governed by the National Numbering Plan. The numbering plan is one of the important 'fundamental plans' along with Switching, Routing, Transmission, Charging and Synchronization Plans that govern the functioning of telecommunications networks. Though these plans are designed for long term, they may require careful and judicious reviews to constantly meet the country's requirements as the telecommunication networks grow and technological developments take place. Availability of numbering

resources for telecommunications services, akin to spectrum for wireless services, is finite and scarce and depends on the way the numbering plan is constructed. A plan may require revision due to unprecedented growth in the number of subscribers or introduction of new services. Substantial revision of the numbering plan is a complex, time consuming and expensive exercise. It therefore makes sense to use the resources sensibly in a managed and controlled manner.

1.4 Numbers have always played a central role in telecommunications and their importance is well recognized. A well-designed numbering plan would ensure a structured approach to allocation and assignment of numbers that is consistent with the best international practices. The plan must ensure that the defined range of numbers allow for expansion of existing services and introduction of wide range of new services, without being prematurely exhausted during the planned period. The increased demand that developments like convergent services, smart devices, machine to machine communication and premium services are likely to make on the numbering resources, needs to be considered.

1.5 In India, a major review of numbering plan was carried out in the year 1993. With the introduction of a large number of new telecommunication services and opening up of the entire telecom sector for private participation, it was felt necessary to rationalize and review this Plan to make it flexible so that it could cater to the numbering needs for about next 30 years in respect of the existing and likely new services.

1.6 Subsequently, due to a rapid growth in the number of subscribers, a major review of the numbering plan was again carried out by the Government in 2003, with the formulation of National Numbering Plan 2003. This plan created a numbering space for 750 million telephone connections – 450 million cellular mobile and 300 million basic phones. The National Numbering Plan (NNP) 2003 was formulated for a projected forecast of 50% tele-density by the year 2030.

1.7 TRAI issued recommendations on "Efficient Utilization of Numbering Resources" on 20th August 2010 in which TRAI had proposed that the existing 10-digit numbering scheme should be continued to avoid inconvenience to the customers that would accompany any move to shift to an 11-digit numbering scheme. TRAI has also recommended that India should migrate to an integrated numbering scheme for fixed and mobile services.

1.8 After 16 years into the National Numbering Plan, adequate availability of numbering resources is threatened because of increase in the range of services and massive growth in number of connections especially in the mobile segment. The total number of telephone subscribers in India stands at 1186.63 million with a tele-density of 90.11 at the end of June, 2019. Resultantly, we again find ourselves in a situation where we need to review the utilization of the numbering resources and take some policy decisions to ensure that adequate resources are available for sustainable growth of telecommunication services.

1.9 TRAI received a reference dated 08.05.2019 from DoT **(Annexure-I)** seeking recommendations on strategies of National Digital Communications Policy, 2018 which inter-alia includes "ensuring adequate numbering resources, by developing a unified numbering plan for fixed line and mobile services".

1.10 The purpose of this consultation paper is to analyze the changes that affect the national numbering plan and to identify the ways in which numbering arrangement and allocation policy might be managed for ensuring adequate numbering resources. The issues covered are the long-term suitability of numbering plan, unified numbering plan, efficient utilization of the numbers and an efficient allocation criterion.

1.11 This Consultation Paper is divided into four chapters. The first chapter introduces the background in which this consultation is being initiated. The second chapter deals with the measures which can be taken for effective utilization of numbering Resources. The third chapter deals with

the present allocation criteria of numbers and associated issues. The last chapter lists the issues for consultation.

CHAPTER II

Measures for effective utilization of Numbering Resources

A- Importance of numbering plan

2.1 Telephone numbers are necessary to identify and use basic and value-added services through switched telephone networks. The purpose of the Numbering Plan is to ensure a structured approach to the allocation of numbers that is in accordance with best international practices. Its primary function is to define the numbering space and its evolution for various existing and prospective services. It must ensure that the range of numbers so defined allows for introduction of a wide range of services and caters to the expansion efficiently, during the planned period, and premature exhaust is avoided. The plan therefore defines the general principles to be applied in management of the numbering resources, and the processes and procedures to be applied. It should contain guidelines for the allocation, assignment and management of numbers. It must make sure that available resources are efficiently managed and their allocation among the service providers is need-based, fair and equitable, and promotes competition and innovation. Any modification should allow for minimal disruption to existing numbers and longer-term stability that minimizes the need for further changes.

2.2 A numbering plan must consider the genuine needs of various stakeholders. Modification in a numbering plan could mean substantial changes in the network and significant network costs and for this reason the service providers want the numbering resources to be carefully managed. If changes are done often then the subscribers have to change their dialing habits and also reprogram their mobile phones and phone books. The planners must remember that wrong or incomplete dialing hold up network resources, building up congestion and loss of paying traffic. Uniform dialing pattern across the country, across service providers and meaningful numbers that give some information about the location of a

called party and the likely cost of a call are subscriber friendly. Business subscribers do not like changes in the numbers as telephone numbers are advertised and printed on stationery and forms which makes changes expensive for them.

2.3 As has been said above, the National Numbering Plan provides a set of rules and guidelines for the use and assignment of numbers to telephone services delivered over the Public Networks. The Plan also describes the allocation of numbers to international services, trunk service, emergency services and special services such as toll free and Intelligent Network (IN) services. The structure of the national number generally conforms to the relevant International Telecommunication Union Standard Sector (ITU) Recommendations. The primary concern of the numbering plan is to give a uniquely identifiable number to every subscriber irrespective of the network he is connected to.

2.4 The numbering plan could follow a closed numbering system where the number of digits to be dialed remains same or it could be open numbering system where the number of digits to be dialed for local and national calls is different. The numbering plan refers to NSNs, where the first N is the national code and SN is the subscriber number. Where local dialing is permitted then just the SN is dialed for connection to another user in the same local area. A single SN, say 2345678, may be assigned to a different customer in each different local area. This kind of plan is known as an open numbering plan. The alternative, a closed numbering plan, exists where there is only a single dialing procedure for all national calls, as for example in Denmark and Norway, where all 8 digits are dialed for all calls and no trunk prefix is needed. The national numbering plan could have geographical numbering scheme or non-geographical numbers like for fixed numbers and mobile numbers respectively or a mix of the two. The plan should also allow for carrier access code for national long distance and international long distance operators, if the need so arises. The numbering plan should have service access codes for services like Intelligent Network services, toll free services or any other service that may

be given in future. Provision has to be made for separate codes for Home Country Direct, International toll free, premium rate, mobile satellite services etc. which are required to be mentioned in the National Numbering Plan. It is an important function of the numbering plan to mandate common numbers for emergency services like fire brigade, police etc. for all the telecom service providers.

B- ITU-T E.164 number structure

2.5 The ITU-T Recommendation E.164 describes "The international public telecommunication numbering plan". This Recommendation provides the number structure and functionality of numbers used for international public telecommunication. The international ITU-T E.164-number is composed of a variable number of decimal digits arranged in specific code fields. The international ITU-T E.164-number for geographic areas is composed of decimal digits arranged in two code fields: the country code (CC) and the national (significant) number N(S)N. The national (significant) number may be further subdivided into national destination code and subscriber number fields, according to national requirements.

2.6 ITU-T recommends that the maximum number of digits of the national (significant) number, N(S)N, should be equal to 15 – n, where n is the number of digits of the country code. The N(S)N is used to select the destination subscriber (the term "subscriber" means a human subscriber or a point where a service is provided). In selecting the destination subscriber, however, it may be necessary to select a destination network. To accomplish this selection, the N(S)N code field comprises a national destination code (NDC) followed by subscriber's number (SN). The NDC and SN may be inseparably connected in some national applications to form a single composite dialling sequence. The NDC field, if used, will be variable in length depending upon the requirements of the destination country. Each NDC may have one of the following structures:

a) a destination network (DN) code, which can be used to select a destination network serving the destination subscribers;

b)	a trunk code (TC);

c)	any combination of destination network (DN) code and trunk code (TC).

The NDCs of a geographic country code may consist of one of the above structures or others as defined by national numbering plan administrators.

2.7	The national telecom network in India has been divided as under:

- SDCA: Short Distance Charging Area also called local area
- LDCA: Long Distance Charging Area comprising of one or several SDCAs

In India for PSTN, NDC is the trunk (Area) code assigned to each SDCA. Each SDCA is allotted a unique trunk code. There are at present 2645 SDCAs distributed in 322 LDCAs. Accordingly, 2645 codes are required to identify the complete country based on SDCA linked numbering scheme. The length of the Trunk Code (TC) shall vary from 2 to 4 digits depending upon the size and telephone density requirement of the SDCA.

2.8	In India, both fixed line numbers and mobile numbers consist of 10 digits excluding the country code. The telephone number for Basic/fixed services has three components:

- CC: country code
- NDC (National Destination code): SDCA code
- SN: Subscriber Number

The SDCA codes consist of 2/3/4 digits while the subscriber number is of 8/7/6 digits respectively. Calls within the local area (SDCA) are defined as local calls. It is an open numbering system in which 6 to 8 digits are required to be dialed for local call from fixed line to fixed line, but 10 digits(SDCA code+ Subscriber number) need to be dialed for national long distance calls with a dialing prefix '0'.

The MSISDN (Mobile Station International Subscriber Directory Number) for cellular mobile services has three components:

- CC: Country code
- NDC (National destination code) which identifies the PLMN

- SN: Subscriber number

It is a closed numbering system for cellular mobile services and all the 10 digits (NDC+SN) should be dialed for calls within India. However, the dialing prefix '0' is not mandatory for inter-circle calls from mobile networks. The 5-digit NDC is referred to as MSC code. The allocation of 5-digit MSC codes are made to the TSPs which caters to 1 lakh customers. The allocation is done in batches of 10 MSC codes which caters to 1 million subscribers.

C- Revisions of the National Numbering Plan

National Fundamental Plan (1993)

2.9 A major review of numbering plan was done in 1993. This plan was formulated at a time when there was no competition in the basic telecommunication services, the competition in cellular mobile services had just started, paging services were in a stage of infancy and Internet services were not available in the country. It could cater to the needs of existing and new services for another few years. During this period either the Government or its public sector undertakings were mainly providing the telecom services. Management of the number allocation was, therefore, not complex.

National Numbering Plan (2003)

2.10 With the introduction of a large number of new telecommunication services and opening up of the entire telecom sector for private participation, it was felt necessary to rationalize and review the existing National Numbering Plan to make it flexible so that it could cater to the numbering needs for about next 30 years in respect of the existing and likely new services. Keeping this in view, National Numbering Plan 2003 (NNP 2003) was formulated for a projected forecast of 50% tele-density by the year 2030. This structure made numbering space available for 750 million telephone connections in the country comprising the anticipated number of 300 million basic and 450 million cellular mobile connections. It was hoped that NNP 2003 will be able to meet the challenges of multi-

operator, multi-service environment and will be flexible enough to allow for scalability for next 30 years without any change in its basic structure. It was designed to meet challenges of the changing telecom environment by reserving numbering capacity to meet undefined future needs.

2.11 National Numbering Plan (2003) was designed to take care of the numbering requirements for about 30 years' timeframe. The situation has changed rapidly since 2003. While the fixed line connections showed a decline, the mobile segment exhibited unprecedented growth. The anticipated 450 million cellular mobile connections by 2030 had already been achieved in 2009. The growth of telephone connections in the last ten years is shown below:

Table 2.1: Subscriber Base-10 years

YEAR	WIRELESS (million)	WIRELINE (million)	TOTAL (million)	GROWTH RATE (%)
March/2010	584.32	36.96	621.28	44.58
March/2011	811.59	34.73	846.32	36.22
March/2012	919.17	32.17	951.34	12.41
March/2013	867.8	30.21	898.02	-5.61
March/2014	904.51	28.49	933	3.90
March/2015	969.89	26.59	966.49	6.81
March/2016	1033.63	25.22	1058.86	6.26
March/2017	1170.18	24.40	1194.58	12.82
March/2018	1183.41	22.81	1206.22	0.97
March/2019	1161.81	21.70	1183.51	-1.88

2.12 There has been a consistent decline in the wireline connections. After a decline in the year 2012-13 due to cancellation of licences and closure of inactive subscribers, the number of wireless connections has increased steadily thereafter. The growth in the year 2016-17 has been somewhat sporadic due to the entry of a new operator with very attractive tariff. However, after mergers and consolidation in the telecom sector, a decline in the wireless connections is also seen in the last year. The overall

subscriber base is 1183.51 million as on 31st March 2019. Since, some of the assumptions made in drawing up the NNP 2003 are no longer applicable, the plan falls short of meeting the developments and needs to be reviewed.

D- Capacity in the existing numbering scheme

2.13 For a 10 digit numbering scheme leaving out level '0' and '1', which are used for special purposes, a theoretical numbering capacity of 8 billion numbers exists. However, local fixed line numbers for fixed network begin with '2', '3', '4', '5', '6', and few sublevels of '7'. The STD (Subscriber Trunk Dialing) codes of various SDCAs begin with different sublevels of '2', '3', '4', '5', '6', '7' and '8'. This renders about 5.9 billion number unusable for mobile network. In a way we can say that these levels are used for just about 21.17 million fixed line connections (as on 30th June 2019). Keeping in view declining fixed line connections and adequate availability of numbering resources, discussion here would focus on numbering resources for mobile services.

2.14 The present allocation and utilization of SDCA linked fixed line numbers is as follows:

Table 2.2: Allocation and Utilization of fixed line numbers

S.No.	Levels	Operator using levels	Working Connections As on 30th June 2019
1.	Level '2'	BSNL/MTNL	13.809 million
2.	Level '4'	Bharti Airtel	4.293 million
3.	Level '30', '33', '34', '37', '38', & '39'	Reliance Comm. Ltd.	0.666 million (after merger)
	Level '793'	Sistema Shyam	
4.	Level '37','50', & '71'	Vodafone Idea	0.363 million
5.	Level '50' to '54'	Quadrant (QTL)	0.219 million
6.	Level '50' to '59'	APFSNL Andhra Pradesh	Not Available
7.	Level '6'	Tata Teleservices	1.819 million
8.	Level '795'	M/s Idea Cellular (Vodafone Idea)	Not available
9.	Level '35' & '796'	Reliance Jio	Not Available
10.	Level '797'	Vmobi Solutions Pvt. Ltd.	Not Available
	Total		21.170 million

2.15 The sublevels of level '5' has been allocated for basic fixed line services in some LSAs. However, vide DoT OM dated 30.11.2006 **(Annexure-II)**, it was decided that all access service providers should use the level '5' for allocation of short codes to the content providers including SMS based services within their own networks.

2.16 With only level '9' for mobile and a 10-digit numbering system, a maximum capacity of 1000 million numbers are available. Some sub-levels of level 7 and 8 have also been used and approximately a capacity of 1100 million is available in these two levels. Thus, a total capacity of 2100 million numbers exist in levels '9'.'8' and '7'. Though there is no technical reason why all 2100 million numbers cannot be used for working connections but because of the reasons of granularity of allocation for each Mobile Switching Center(MSC), numbers blocked in the distribution chain, administrative processing time for allocation of new blocks of numbers and other inefficiencies of the system, utilization cannot reach 100%. For these reasons, DOT allocates new blocks of number to service providers after the service providers demonstrate a specified percentage utilization of the already allocated numbers. Therefore, the present capacity of 2100 million number resources with DOT are exhausted after nearly 1.2 billion connections have been given and after that there are no new numbers left for allocation unless more levels/sublevels are freed up for mobile network use. Recently, DoT has also started withdrawing the scarcely utilized MSC code numbering series allocated to the TSPs in different LSAs and reallocated them to TSPs who need it more. Few sub-levels of '6' which have been vacated by the wireline service providers have also been allocated for mobile services

E- TRAI Recommendations on "Efficient Utilization of Numbering Resources" (20th August 2010)

2.17 TRAI issued recommendations on "Efficient Utilization of Numbering Resources" on 20th August 2010. In this recommendations TRAI has proposed that the existing 10-digit numbering scheme should be

continued to avoid inconvenience to the customers that would accompany any move to shift to an 11-digit numbering scheme. TRAI has recommended that India should migrate to an integrated numbering scheme for fixed and mobile services. In other words, both fixed line and mobile phones will have a 10-digit number. TRAI also recommended that till the integrated scheme is implemented, the dialing of intra-circle calls from the fixed line to mobile should be prefixed with '0' to enable the exploitation of spare capacity available in the sublevels of existing SDCA codes. For making allocation of numbers more efficient, TRAI has recommended automation of the allocation process. TRAI has also proposed that it will go ahead with the work of preparation of detailed plan for migration to the integrated numbering scheme.

2.18 In response to the recommendations given by TRAI, a reference back dated 21st March 2012 was received with the comments of the DoT on the recommendations. Some additional observations of DoT were also enclosed for reconsideration of TRAI. In the reference back, the DoT in principle agreed to continue with the 10-digit numbering scheme. However, DoT asked TRAI to reconsider its recommendation for prefixing '0' in all fixed to mobile intra-service area calls. Instead, DoT suggested that the basic service providers may be asked to vacate some of the levels (5,6 &3) earmarked for basic services which are grossly unutilized. DoT also asked TRAI to reconsider its recommendation on integrated numbering scheme citing issues in carrying out changes in rural exchanges for a 10-digit dialing pattern for fixed line numbers. DoT also emphasized that barring the USA, no other major country is following integrated numbering scheme. DoT had also asked TRAI to give recommendations on part utilization of '92' and '93' levels for GSM customers.

2.19 TRAI gave a careful consideration to the various comments as well as the additional observations of DoT and gave its response vide letter dated 11th May 2012. TRAI reiterated it earlier recommendations including the one that country should migrate to integrated 10-digit numbering scheme in

a time bound manner. TRAI was of the view that creating numbering resources through vacation of levels, as suggested by DoT, would be disruptive to already struggling fixed line segment. It would create changes in large number of working telephone numbers and create discontent among subscribers. The scheme suggested by DoT, would only affect some of the service providers and would therefore be discriminatory.

2.20 Despite the reconsidered view of TRAI, the prefixing of '0' for fixed to mobile intra circle calls was not implemented. DoT started allocating spare SDCA codes in level '7' and '8' for wireless mobile services.

2.21 In the meantime, full mobile number portability was implemented w.e.f. 3rd July 2015. With this, it is possible to port mobile numbers from one licensed service area to another licensed service area. With the implementation of full mobile number portability, DoT has made it mandatory to allow dialing of intra-service area calls (basic to mobile and mobile to mobile) without any prefix **(Annexure-III)**.

2.22 After exhausting all the spare codes of level '7'and '8', DoT has also started to withdraw the scarcely utilized MSC code numbering series allocated to the TSPs in different LSAs. These withdrawn levels are being re-allocated to other TSPs who have exhausted their earlier allocations.

2.23 DoT has also allocated a 13-digit numbering series for M2M services which consists of 3 digit M2M identifier, 4 digit licensee identifier, and 6 digit device number. So, gradually all the M2M devices which were using the 10 digit numbering series used for P2P(person to person) services are getting migrated to the new 13 digit series. In July 2016, the DoT issued 3-digit M2M identifier codes: 559, 575, 576, 579 and 597.

F- The need for regulatory intervention

2.24 TRAI received a reference dated 08.05.2019 from DoT seeking recommendations on strategies of National Digital Communications Policy, 2018 which inter-alia includes "ensuring adequate numbering

resources, by developing a unified numbering plan for fixed line and mobile services".

2.25 One of the functions of the Authority is to take measures to facilitate competition and promote efficiency in the operation of telecommunications services to facilitate growth in such services. The regulator needs to set the rules governing other competitive issues with numbering implications. The incumbent operators would fiercely safeguard their possession of large blocks of numbers and are unlikely to share numbering resources fairly with new competitors even though the utilization may be low. When deciding technology and timing of services the regulator need to envision potential capacity shortages and suggest changes in the scheme architecture. If a major modification is being examined, the regulator needs to consider views of all the stakeholders and act in the interest of the consumers. It must be kept in mind that the proposed changes should not put a set of service providers to disadvantage from the competitive viewpoint. From the consumers' point of view the numbering scheme should be easy to understand and use.

G- Possible Solutions to the problem

2.26 As per the UN's "World Population Prospects, 2019"[1] report. India is projected to become the most populous country by 2027 surpassing China, and host 1.64 billion people by 2050. The population is supposed to peak at 1.6518 billion in the year 2059 and gradually start declining thereafter.

2.27 Currently, we have about 1.2 billion telephone subscribers. We are having subscribers with multiple telephone connections. The quality and reach of the networks are expected to improve due to technological developments, mergers, acquisitions and other type of consolidations. Due to the technological developments and other means of communications like OTT the multiplicity of telephone connections is also expected to decrease.

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[1] https://www.un.org/development/desa/publications/world-population-prospects-2019-highlights.html

However, it is likely that largescale increase in requirement of numbers will be there for PSTN/PLMN network based devices catering to M2M and IoT applications. A 13 digit numbering series has already been earmarked for these applications.

2.28 As per ITU ICT indicators report, 2018[2] the mobile cellular subscription density per hundred inhabitants for developed countries is 128 and fixed telephone subscription density per hundred inhabitants is 36.7. In India the numbering resources allocated for wireline are underutilized, but the main challenge is to ensure adequate resources for wireless services. Even if we assume a 200% wireless tele-density in India; in 2050 the total number of mobile telephones working in this country is likely to be nearly 3.28 billion. Assuming 70% utilization of the numbering resources, 4.68 billion numbers will be enough to cater to the mobile telephones working in this country in the year 2050.

2.29 The Numbering Plan Administrator has allocated numbers from level '9' and free sub-levels of level '7' and '8'. These three levels together would give about 2100 million numbers. If we can manage an additional 2600 million numbering resource, we may be able to tide over this crisis. The following options are explored to get around the problem of shortfall of numbers.

(i)Unified Numbering Plan

2.30 The NDCP, 2018 refers to unified numbering plan for fixed line and mobile services. Presently India follows an SDCA linked numbering scheme for fixed telephones in which the country is divided into 2645 SDCAs with unique SDCA code. On the other hand, the mobile numbering series is not geographical. The Indian Telecom Network is divided into 22 Service Areas for the purpose of Licence. Although, the MSC code allocations are made LSA(Licensed Service Area) wise to the cellular mobile service providers there is no geographical link. All India mobile number portability has also been introduced in the country.

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[2] https://www.itu.int/en/ITU-D/Statistics/Pages/stat/default.aspx

2.31 The North American Numbering Plan (NANP) is an integrated telephone numbering plan serving 20 North American countries, including the USA, that share its resources. The International Telecommunications Union (ITU) assigned country code "1" to the NANP area. The NANP conforms with ITU Recommendation E.164, the international standard for telephone numbering plans. NANP numbers are ten-digit numbers consisting of a three-digit Numbering Plan Area (NPA) code, commonly called an area code, followed by a seven-digit local number. The format is usually represented as:

NXX-NXX-XXXX, where N is any digit from 2 through 9   and X is any digit from 0 through 9.

2.32 In order to implement unified numbering plan in India it will be necessary to have a re-look at the SDCA based numbering and Point of Interconnect architecture for handing over wireline or fixed wireless calls. There are broadly two ways to migrate to an integrated numbering scheme, one would be to merge the SDCA code with the subscriber number and form a 10-digit number for fixed line and the second would be to identify one or more unique codes for each service area/circle and fill up the remaining digits to make a 10 digit number.

2.33 The first method offers the advantage of keeping the subscriber number unchanged. There would be no change in the digits dialed for calls to any subscriber in another SDCA or another service area (national long-distance calls). The method would give a uniform 10 digit numbering scheme for fixed and mobile and all 10 digits would always be dialed whether the subscriber dials a local number of a long digit number. Short Distance Charging Area (SDCA) codes of 2, 3 and 4 digits would be merged with the fixed line subscriber numbers which are correspondingly of 8, 7 and 6 digits to form a unique 10 digit subscriber number. For example, a Jodhpur number 2474567 becomes 2912474567 as the SDCA code of Jodhpur is 291. No change would be required in the existing mobile numbers. The initial digits may still have geographical significance and with some discipline in allocation, geographical significance can be

maintained for future allocations. Inter- modal number portability may also become possible between fixed and mobile systems in the future. Inter-modal portability means number portability between fixed to mobile and vice versa. However, intermodal number portability is prevalent in very few countries like U.S.A. and Chile.

2.34 One of the main challenges in implementing the first method will be to shift SDCA codes of level '1' to other levels to avoid overlapping of 10-digit subscriber number with level '1' service code. The legacy telephone network will also require upgradation with centralized database of numbers so that the routing can be done to the port of the destination number. In legacy switches, the routing of calls is done based on the dialed digits and the geographical link of the decentralized switches are necessary for switching the calls. Emergency number caller localization may need to be worked out.

2.35 The second method involves allocating new codes to service areas e.g. '12' and '13' for UP, '14', '15' for Rajasthan etc. and take the remaining 8 digits from the existing number (3rd to 10th digits from SDCA code+number). This method requires subscriber numbers to be altered substantially for the advantage of geographical identification of the service area from the numbers. In this scheme, for local calls only 8 digits would need to be dialed. This method also gives uniform 10-digit numbering scheme for fixed and mobile and allows number portability between fixed and mobile systems to be implemented. Emergency number caller localization may need to be worked out.

2.36 The main difference between the two methods is that in the second method the service area could be uniquely identified by the first two digits at the cost of large-scale change of subscriber numbers. In the first option also the SDCA codes of level '1' will have to be shifted to other levels to avoid overlapping of 10-digit subscriber number with level '1' short code numbers. However, if dialing with access code '0' is made compulsory for all fixed line numbers, then no change will be required in SDCA codes

starting with level '1'. Considering all the aspects it is felt that the first method would be easier and more consumer friendly to implement. The service providers need time to restructure the network, re-arrange POIs, and change the routing and billing information. The service providers with legacy fixed network may take a little more time in this restructuring and upgradation process.

(ii) Creating numbering resources by vacating fixed line levels

2.37 The fixed line levels '3', '5' and '6' are grossly underutilized. The total number of basic telephone connections in level '2' is 13.809 million and that in level '4' is 4.293 million (as on 30th June 2019). By sparing the underutilized levels '3', '5', and '6' and moving them to a sublevel of '2' or '4', several million numbers can be used for mobile numbers. However, this will lead to large scale change of numbers and will be disruptive to fixed line segment. However, this will also lead to efficient utilization of the numbering resources. All the spare levels of level '3', '5' and '6' can be used for allocation for wireless MSC codes after taking into consideration the existing SDCA codes in these levels. However, this arrangement will be able to generate numbering resources for a few years only.

(iii) Mandating dialing prefix '0' for calling mobile numbers from fixed line

2.38 The Unified Licence defines 'Local Calls' and 'Long Distance Calls'.[3] "Local Calls" mean calls originating and terminating within the same local area, which are charged at local call rates. For Basic Service, the SDCA is local area and for mobile network, the Service Area is local area. "Long Distance Call" is defined as a call terminating in a local area other than that in which it is originated. Long distance calls in India are also termed as STD (Subscriber Trunk Dialing) calls. International calls are termed as ISD (International Subscriber Dialing) calls.

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[3] http://dot.gov.in/sites/default/files/Unified%20Licence_0.pdf

2.39 Presently, inter service area mobile calls from basic/fixed phone can be accessed with a dialing prefix '0'. However, mobile phones are accessed from a fixed line phone, within a service area, without dialing prefix '0'. This puts the limitation that any digit which has been used as a first digit for fixed network (for local calls) cannot be used for the mobile numbers. By making it mandatory to access mobile numbers in a service area from fixed network by dialing prefix '0', all the free sublevels in levels '2','3','4' and '6' (which are not used for SDCA codes) can also be used for mobile numbers. The level '5' may not be used as it is being used as short codes for content providers and also as M2M identifiers in 13 digit M2M numbers. This arrangement would provide a capacity of around 2.5 billion mobile numbers. No change in dialing plan of fixed to fixed, inter-circle fixed to mobile and mobile to mobile is required. Implementing this option should not be a difficult proposition as the subscribers already need to use '0' for calling adjacent SDCAs and for mobile numbers in other service areas.

2.40 TRAI has earlier also recommended for prefixing '0' for dialing all mobile numbers from fixed line vide its recommendation dated 20th August 2010. However, in its reference back dated 21st March 2012, DoT has said that rural subscribers will have to be provided with dynamic lock facility in order to access intra service area mobile calls and hence this could not be implemented. DoT has also said that all subscribers are not aware enough to use dynamic STD locks and will face problem in dialing fixed to mobile intra-service area calls with mandatory prefixing of '0'.

2.41 Normally, landline phones are provided with dynamic locks for preventing unauthorized usage. One can lock his/her telephone electronically by using a secret code. It is possible to lock/allow Local, STD or ISD calls in many ways viz. all calls allowed, only local calls allowed, only STD & Local calls allowed, all outgoing calls barred etc. Earlier, it was not possible to provide these dynamic locks in small exchanges in rural areas due to capacity constraints, but now there is no such constraint since all the operators have upgraded their networks. The general awareness of both

rural as well as urban subscribers about use of dynamic lock facility has increased over the years. Further, the dynamic locks were crucial when the price difference between a local and STD call was significant, and hence potential chances of unauthorized use was high. But, presently when the price difference between STD and local call is negligible, the same code may be used together for locking/allowing local as well as STD calls. The code for allowing/blocking ISD calls may continue as earlier. It is also technically possible in the new wireline switches to program the STD dynamic lock for STD/ISD barring, in such a way that the inter-SDCA area wireline calls may be barred and all the mobile calls (intra-circle as well as inter-circle) with access code '0' may be allowed. So, by simply changing the dialing pattern for mobile numbers from fixed phones we will be able to utilize the levels '2', '3','4' and '6' excluding the SDCA codes, for mobile numbers. Even in case of SDCA codes starting with '2', '3', '4' and '6', the SDCA code with suffix 0,1,8 and 9 can be used for allocation of MSC codes for mobile services.

(iv) Shifting Data only mobile numbers from 10 digit to 13 digit numbering

2.42 Nowadays, some mobile connections are used purely for Internet or mobile data (dongles) but 10 digit mobile numbers are allocated from the same series which is used for voice communication. DoT has already allocated 13 digit numbers for M2M communication. It is also possible to shift these data only connections (SIMs[4] used for data cards, dongles and other devices used only for Internet access) to 13 digit numbering series, since these devices are not used for making PSTN voice calls. It is also possible to provide private numbering series for these numbers by the cellular mobile operators (which is internal to their network). This will release some of the numbering resources blocked by the operators.

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[4] Subscriber Identity Module or Subscriber Identification Module: an integrated circuit that securely stores the international mobile subscriber identity (IMSI)

(v) Switching over from 10 digit to 11-digit scheme

2.43 Switching from 10 to 11 digits with first digit fixed as 9 would give a total capacity of 10 billion numbers. With the current policy of allotment after 70% utilization this would suffice till India has 7 billion connections. This could mean liberal allocation to service providers and administrative ease. However, some problems are anticipated with change in the mobile number from 10 digits to 11 digits. This would require modification in all fixed and mobile system software and number storage involving cost. Inconvenience to the consumers in the form of (a) dialing extra digit, (b) updating whole phone memory. This could lead to more dialing errors, infructuous traffic and loss of revenue.

2.44 Since telephone numbers are also associated with the digital identity of individuals, changes will be required in all databases requiring telephone numbers for identity, financial banking services, e-commerce and government welfare schemes using telephone numbers. So, lot of software changes and upgradations will have to be resorted to in different sectors of the economy and may have widespread economic and security implications. There will be a disruptive impact on the digital economy in which telephone number plays a very important role. However, migration from 10 digit to 11 digits may be resorted to, if all the efforts to continue with 10 digit numbering are exhausted.

H- International Experience on number of digits

2.45 The following Table provides number of digits used for Fixed and Mobile numbers in various countries along with the number of fixed and mobile connections:

Table 2.3: Number of digits in telephone numbers

S. No.	Country	Number of Digits[5]		No. of Connections (2018)[6]	
		Fixed Networks	**Mobile Networks**	**Fixed**	**Mobile**
1	**Australia[7]**	10 digits	10 digits ('04' + 8 digit) '05' also allocated to digital mobile phones	8,090,000	28,279,000
2	**Brazil**	10 digits (2 digit Area Code + 8 digit)	11 digits (2 digit Area Code + 9 digit ('9' is added before 8-digit number used previously)	38,307,231	207,046,810
3	**Canada**	10 digits including 3 digit Area Code	10 digits including 3 digit Area Code	13,900,000	33,082,000
4	**China**	7 to 8 digits excluding 2 to 3 digit area code	11 digits (in the format 1xx-xxxx- xxxx) with 3 Digit for Mobile Phone Service Provider ID	182,248,000	1,641,147,000
5	**Egypt**	9 digits including 1 or 2-digit Area Code	10 digits including operator code	7,865,286	93,784,497
6	**France**	9 digits including area Code	9 digits (No Area Code)	38,620,000	70,455,000
7	**Germany**	No standard lengths for either area codes or subscribers' numbers. Area Code varies from 2 to 5 digits and total digits varies from 5 to 11 digits.	No standard lengths for either area codes or subscribers' numbers. Operator Code varies from 3 to 5 digits and total digits varies from 10 to 11 digits.	43,000,000	107,500,000
8	**Indonesia**	7 to 10 digits (With Area Code)	9 to 10 digits (including 3 to 4 digit Mobile Operator Prefix)	11,207,516	320,769,951
9	**Italy**	6 to 10 digits including Area Code.	10 digits	20,396,603	83,342,486
10	**Japan**	9 digits including the area code of 1 to 5 digit	10 digits (No Area Code)	63,442,828	177,066,649

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[5] https://www.itu.int/oth/T0202.aspx?lang=en&parent=T0202
[6] https://www.itu.int/en/ITU-D/Statistics/Pages/stat/default.aspx
[7] https://www.acma.gov.au/Industry/Telco/Numbering/Managing-numbers/telephone-numbering

S. No.	Country	Number of Digits		No. of Connections (2018)	
		Fixed Networks	**Mobile Networks**	**Fixed**	**Mobile**
11	**Malaysia**	1 to 2 digit Area Code + 6 to 8 digit Subscriber Number	mobile network identifier code of 3 digits + seven-digit subscriber number (10 to 11 digit)	6,433,300	42,413,400
12	**Mexico**	10 digits including 1 digit area code	10 digits .	21,361,470	117,367,219
13	**New-Zealand**	8 digits including area code	9 to 10 digits	1,760,000	6,400,000
14	**Nigeria**	1 to 3 digit area code + 7 digit	3 to 4 digit Operator Code + 6 to 7 digit Subscriber Number.	140,491	172,730,603
15	**Pakistan**[8]	2 to 5 digit area Code + 4 to 8 without area Code (8 digit only in Lahore and Karachi)	2 digit specific Mobile Phone Code assigned to a mobile telephone operator+ 8 digit Mobile Number	2,798,606	153,986,607
16	**Philippines**	1 to 3 digit area code + 7 digit phone number	3 digit area codes always start with the number "9" + 7 digit subscriber Number	4,163,282	115,824,982
17	**Russia**	3 digit area code + 7 digit subscriber Number	3 digit area code + 7 digit subscriber Number	31,952,072	229,431,008
18	**South Africa**	10 digits including 3 digit Area Code	10 digits including 3 digit Operator specific Prefix	3,103,750	88,566,977
19	**Turkey**	3 digit Area Code+ 7 Digit	3 digit cell company id no. + 7 digits	11,633,461	80,117,999
20	**UK**[9]	10 digits (Including 2 to 5 digit area Code)	10 digits	31,973,308	78,924,326
21	**USA**	10 digit including 3 digit area Code (format NXX-NXX-XXXX) where N can be from 2 through 9 and X can be from 0 through 9	10 digits including 3 digit area code	116,724,000	404,577,397

In this table, we can see that only China and USA with (182+1641=1823) million and (117+405=522) million subscribers respectively are comparable with that of India. China has 11-digit numbering for mobile services (with service provider code) and USA has an integrated numbering

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[8] https://www.pta.gov.pk/media/num_plan_230108.pdf

[9] https://www.ofcom.org.uk/__data/assets/pdf_file/0013/102613/national-numbering-plan.pdf

system with 20 other countries in the Americas. Very few countries have unified numbering scheme and very few are using 11-digit numbering for mobile services.

2.46 In view of the above, stakeholders are requested to give their comments on the following issues with justification:

Issues for consultation

Q1. Whether, the unified numbering scheme should be introduced in India? If yes, please provide the possible ways of implementing it with justification.

Q2. If the answer to the preceding question is in the negative, which of the following options can be tried out? Please provide details and justification considering the advantages and disadvantages.

(i) Vacating the sparingly used fixed line levels '3','5' and '6' for allocation for mobile services

(ii) Accessing intra-service area as well as inter-service area mobile from fixed line by dialing prefix '0'; for generating more numbering resources for mobile services?

(iii) Shifting Data only mobile numbers from 10 digit to 13 digit numbering

(iv) Moving on to 11 digit numbering scheme for mobile and continuing with 10 digit numbering for fixed line services

(v) A combination of some of the above

(vi) Any other option

CHAPTER- III

Allocation of numbers

A- Present Allocation criteria for numbers

3.1 The numbering system for basic services is linked with SDCA. The service providers have been given pre-defined levels that decide the amount of numbering resources they have. The Levels '2' and '4' and various sub-levels of '3', '5','6' and '7' are being used for fixed line numbers. The present distribution of different fixed line levels and working connections in each level is given in the previous chapter. The service providers are also allowed to use these allocated numbers in more than one LSA (licensed service area). Additional numbers are allocated to requesting service providers after they demonstrate 80% utilization of already allocated numbers. Recently, two/three-digit sublevels having been allocated to the latest entrants in basic wireline services.

3.2 Level '9' and some sublevels of '7'and '8' have been allocated for mobile services. Few sub-levels of '6' which have been vacated by the wireline service providers have also been allocated for mobile services. As per the existing criteria followed by the Numbering Plan Administrator, mobile service providers are initially allocated 1 million numbers in a service area and additional numbers are allocated as and when requested by service providers, after demonstrating some specified level of utilization.

3.3 Earlier, DoT used to allocate numbering resources for mobile services as per the HLR (Home location register) subscriber figures. It was observed that there is a significant difference between the HLR figures and VLR (Visiting Location Register) figures of the mobile subscriber base. It is because the TSPs normally keep permanently inactive customers in HLR for long time and effective re-cycling of these numbers is not being done. Hence, DoT felt that in order to exercise better control of the scarce

numbering resource, the allocation of MSC codes based on VLR figures is better than the practice of allocation of new MSC codes based on HLR figures.

3.4 At present the allocation of MSC codes Numbering Series to TSPs is done following a VLR based criterion defined vide DoT Letter No.16-03/2015-AS-III(Part-III)/MSC Codes/27/806 dated 08/11/2017 (**Annexure-IV**). The salient features are reproduced below: -

(a) Both attached and detached VLR figures are to be considered (added) to calculate the total VLR figure.

(b) In case of intra-circle roaming agreements, intra-circle in-roamers should be deducted whereas the intra-circle out-roamers shall be added to arrive at net VLR figures.

(c) Inter-circle in-roamers (of any operator) will be deducted and inter-circle out-roamers will be added.

(d) The VLR figures may be taken as average of 7 days VLR count.

(e) Inclusion of Port-In numbers and exclusion of Port-Out number from the total MSC code series allotted till date to respective TSP.

(f) MSC codes are issued if the VLR figures reached the count taking para (a) to (e) into account as below: -

S.No.	Numbers Allocated (N)	VLR Figure (V) as %age of Number Allocated (V/N)
1.	Less than 3 Million	Subject to minimum of 40%
2.	3 Million to less than 6 Million	Subject to minimum of 45%
3	6 Million to less than 8 Million	Subject to minimum of 50%
4	8 Million	Subject to minimum of 55%
5	9 Million	Subject to minimum of 60%
6.	10 Million to less than 15 Million	Subject to minimum of 63%
7.	15 Million to less than 20 Million	Subject to minimum of 66%
8.	20 Million to less than 25 Million	Subject to minimum of 68%
9.	25 Million and above	Subject to minimum of 70%
N= Number allocated V= VLR figure		

3.5 Recently, DoT has also started to withdraw the scarcely utilized MSC

code numbering series allocated to the TSPs in different LSAs. These withdrawn MSC codes are being re-allocated to the TSPs whose subscriber base is increasing. The new TSP is instructed to port out the existing working connections in the re-allocated level.

3.6 In the recent past; some closures, mergers and acquisitions have taken place in the telecom sector. It is possible that some of these merged entities might be having an excess of numbering resources. Till date the following developments have taken place:

(i)   The merger of Vodafone and Idea has been completed.

(ii)   Telenor has merged with Bharti Airtel

(iii)   SSTL has merged with Reliance Communication Limited.

(iv)   Reliance Communications has closed its wireless voice service

(v)   Videocon has already closed its operation

(vi)   There is the proposal of merger of wireless services of M/s Tata Teleservices with M/s Bharti Airtel.

3.7 In view of these mergers and closures, it needs to be considered whether any change is required in the allocation criterion. It is also possible to take back some of the numbering resources if it is not getting used. In case of mergers, it makes sense that the combined previous allocations should be considered for calculating the utilization before any new allocation. If some of the MSC codes allocated are sparingly used by some of the TSPs with declining number of subscribers, the same may re-allocated to a growing TSP. The existing working connections in the re-allocated level may be ported out. If the number of working connections in an allocated level is less than 10-20% after one year of allocation the same may be reallocated to another TSP.

3.8 The utilization of the numbering series allocated is done on LSA basis. For access service providers having licences in all/many LSAs, it may be possible that the numbering series in one of the LSAs may be

underutilized while in other LSA the numbering resources may be exhausted. It is possible to allow them to allocate the numbers in any LSA in which they are operating.

B- Annual Numbering Return

3.9   It is important to devise mechanisms to have a good monitoring system for effective utilization of numbering issues. One possibility is that all service providers making use of numbering resources may be required to submit a detailed "Annual Return on Numbering Resource Utilization" to the Numbering Plan Administrator every year. The Numbering Plan Administrator may carry out the numbering audit of usage of numbers by service providers based on these returns. The following additional information could be included in the Numbering Return:

- Number resources allocated to the licensee
- Total number used
- Numbers for internal use (Test/Service Cards, Employees)
- Numbers under quarantine (disconnected numbers)
- Numbers suspended pending disconnections
- In case of Mobile Service Providers, Number of SIMs in distribution network with retailers and distributor networks and in hand.
- Details of numbers set aside for planned growth, customer orders or other usage, with explanations
- A three-year forecast of demand within significant ranges
- Details of numbers ported inward and outward
- Any other information requested by the Numbering Plan Administrator.

C- Pricing of numbers:

3.10   At present the service providers do not pay for the numbering resources allocated to them. It has been observed from some websites and

newspaper reports that most of the service providers charge their subscribers for allocating preferred numbers or 'vanity numbers'. Some service providers even resort to auction of numbers for higher revenue.

3.11 It has been seen that most regulators in Europe put a modest charge on the numbers. It is felt that charging for the numbers allocated to operators may be used as a tool to encourage efficient use of numbering resources and would also be in line with practices followed internationally regarding charging of numbers.

3.12 It may be useful to put a small charge for numbers even though a portion of the number sale proceeds of service providers is paid as percentage on Adjusted Gross Revenue (AGR). It is apparent that numbers are an extremely valuable public resource. After the analysis of the international practices and the present state of utilization of numbers, it is felt that charging a reasonable amount for each number allocated would encourage the service providers for a more efficient utilization of numbers.

3.13 The stringent criteria laid down for allocation of numbering resources alone may not justify the free allocation of numbers. The numbering space belongs to the government. The service providers are given usage rights over the assigned number ranges during the tenancy of the licence. Though service providers may argue that they are not marketable commodity, yet it cannot be denied that most service providers charge for numbers that may have higher demand.

3.14 The following different forms of charging are possible:

- A one-time charge per number
- A one-time charge per block of numbers
- An annual charge per number held

- An annual charge per block of numbers held
- An annual charge per active number held

3.15 The following Table gives approaches adopted for pricing of numbering resources in various countries:

Table 3.1: Numbering fee across various countries

Sr. No.	Name of country	Method adopted	Existing charge
1	**Australia**[10]	Application charges, annual numbering charges and also auction for smart numbers	• A one-time registration charge of $35.00 applies. • Total ANC (Annual Numbering Charge) revenue target for 2019 is $60 million from numbers held by providers. • The base number charge for 2019 was $0.6309243135 (for a ten-digit number). • The ANC does not apply to the Geographic numbers
2	**Belgium**[11]	Annual charge	• Annual charges for normal geographic number for the year 2019: €127 for (10000 numbers) • Annual charges for mobile number for the year 2019: €1897 for (1,00,000 numbers)
3	**Finland**[12]	Annual charge	• Annual Charge for both public fixed and mobile number: € 0.16 per subscription
4	**France**[13]	Annual charge	• Standard number block of 10 digits: (Number of numbers available in the block multiplied by 0.02 €) • Number block in standard 13 or 14-digit extended format :(Number of available numbers in the block multiplied by 0.002 €) • For every assigned 6 digit number (118XYZ) :(an amount equal to 40 000 €) • Special 4-digit number (of the form 10XY): (an amount equal to 40 000 €) • 4-digit short number (of the form 3BPQ): (an amount equal to 40 000 €) • 4-digit prefix (of the form 16 XY): (an amount equal to 40 000 €) • 1-digit prefix: (an amount equal to 400 000 €)

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[10] http://acma.gov.au/Industry/Telco/Carriers-and-service-providers/Licence-fees-annual-levies-and-charges/anc-information-for-carriage-service-providers

[11] http://www.bipt.be/en/operators/telecommunication/Numbering/charges-fees

[12] https://www.traficom.fi/fi/puhelinverkon-numerointimaksut

[13] https://archives.arcep.fr/index.php?id=8092&L=1

Sr. No.	Name of country	Method adopted	Existing charge
5	**Pakistan**[14]	Annual Charge	• The application processing fee amounting to Rs. 1000. • 6-digit (or higher) digit number @ Rs. 0.50 per number per financial year. • Short Codes etc. @ Rs. 5000 per number per financial year.
6	**UK**[15]	Annual Charges	Fee is depending on the kind of number based on geographical area, block size etc.
7	**Lithuania**[16]	Monthly	• Public fixed telephone communication service number: 0.006 €/month. • Public mobile telephone communication service number: 0.006 €/month • Service number from the 7XXXXXXX series: 0.006 €/month. • Service number from the 8XXXXXXX or 9XXXXXX series: 0.52€/month.

Some other countries like **Czech Rep.[17], Bulgaria[18], Hong Kong[19], Greece[20], Germany[21] and Denmark[22]** also charge annually for numbering resources based on the kind of number, allocation efficiency and the scarcity of the assigned resources. On the other hand, some countries like **Canada**, **New Zealand**, **Ireland[23]** and **USA** do not charge any allocation fees for numbering resources.

D-Automated Allocation of numbering resources

3.16 TRAI in its recommendations on "Efficient Utilisation of Numbering Resources", 2010 has recommended for automated allocation of numbering resources. This recommendation was accepted by DoT but still the entire process of allocation of numbers is being done manually and no automation

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[14] https://www.pta.gov.pk/media/Numbering%20Allocation.pdf

[15] https://www.ofcom.org.uk/phones-telecoms-and-internet/information-for-industry/numbering/geo-guidance

[16] https://www.rrt.lt/en/electronic-communications/numbering/

[17] https://www.ctu.eu/numbering-plan

[18] https://0900.bg/?request=articles&a=kakvo-e-0900-nomer

[19] https://tel_archives.ofca.gov.hk/en/numbering/faq.html#p2

[20] https://www.eett.gr/opencms/export/sites/default/EETT_EN/Electronic_Communications/Telecoms/Numbering/DecisionNewNNP.pdf

[21] https://www.bundesnetzagentur.de/DE/Sachgebiete/Telekommunikation/Unternehmen_Institutionen/Nummerierung/Nummerierungskonzept/nummerierungskonzept_node.html

[22] https://ens.dk/en/our-responsibilities/telecom/numbering

[23] http://www.comreg.ie/_fileupload/publications/ComReg0436.pdf (Page 4/27)

has been done.

3.17   The information on availability of resources, data from the returns filed and the rules for allocation could be built into an application which could dispense free block of numbers according to the present rules. This application software can be integrated with the MNP database and also with the numbering allocation database of the telecom service providers.

3.18   Presently, number management systems are being used in most of the developed countries by the numbering plan administrators. The number management system is also able to give details of the utilization of the allocated numbering resources. It acts a bridge between the numbering plan administrators and the telecom service providers and increases the overall transparency and efficiency of the number allocation process as well as its utilization. Some of the TSPs complain that there is a significant delay in opening new routes for the allocated numbering resources in all the networks. This issue can also be solved if a consolidated dynamic database is maintained by the numbering resource administrator in the number management system which is open and accessible to all the stakeholders. The work of numbering resource administration and management can also be assigned to an independent body by the licensor.

E- Revision of numbering plan and consolidation of short codes

3.19 The National numbering Plan, 2003 has been amended several times since its inception and some major changes have also been made. It is difficult to formulate a single document which incorporates all the changes. In some cases, the basic structure has also been altered. In such a situation it is desirable to have a revised and new National Numbering Plan. It is needless to say that it is an important national policy document which should be regularly updated to keep up with the changes.

3.20 The allocation of short codes for emergency services, travel related

information and for other non-commercial use for general public is done by DoT. The charging for these numbers is either toll free or metered. The allocation letters are issued by DoT for each short code, but no consolidated list has been uploaded on the DoT website. Several agencies who have been allocated short codes struggle to get it opened in all the TSPs networks. Sometimes, the agencies that are allocated these short codes do not use it afterwards. These codes should be vacated and reallocated to another organization. In such a scenario, dynamic database of all the short codes should maintained by the number administrator and monitored for implementation.

3.21 In view of the above, stakeholders are requested to give their comments on the following issues with justification:

Issues for Consultation

Q3. Do the present criteria of utilization for allocation of numbers ensure efficient utilization of the numbering resources or would you suggest some other criteria?

Q4. Do you feel that sparingly used MSC codes may be withdrawn and reallocated to another TSP whose subscriber base is growing?

Q5. Do you feel that there is a need to file an "Annual Return on Numbering Resource Utilization" to the numbering plan administrator for monitoring and ensuring efficient utilization of number?

Q6. What are your views on the pricing of numbering resources? If pricing is implemented should it be for all resources held by the service provider or only for future allocations?

Q7 Do you feel that an automated allocation of numbering resources using number management system software is necessary to speed up the process of allocation and collecting returns in an efficient and transparent manner? Do you feel that this work may be assigned to an independent body by the licensor? Please provide details.

Q8. Do you agree that a revised and new National Numbering Plan and a consolidated list of short code allocations should be issued? If so, what should be the periodicity?

Q9. Any other related issue.

CHAPTER- IV
Issues for Consultation

4.1 Stakeholders are requested to provide their answers/comments on the following issues. It may be noted that the answers/comments should be supported with justification in details. The stakeholders may also comment on any other related issue with details and justification.

Q1. Whether, the unified numbering scheme should be introduced in India? If yes, please provide the possible ways of implementing it with justification.

Q2. If the answer to the preceding question is in the negative, which of the following options can be tried out? Please provide details and justification considering the advantages and disadvantages.

(i) Vacating the sparingly used fixed line levels '3','5' and '6' for allocation for mobile services

(ii) Accessing intra-service area as well as inter-service area mobile from fixed line by dialing prefix '0'; for generating more numbering resources for mobile services?

(iii) Shifting Data only mobile numbers from 10 digit to 13 digit numbering

(iv) Moving on to 11 digit numbering scheme for mobile and continuing with 10 digit numbering for fixed line services

(v) A combination of some of the above

(vi) Any other option

Q3. Do the present criteria of utilization for allocation of numbers ensure efficient utilization of the numbering resources or would you suggest some other criteria?

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Numbering Resource Utilization" to the numbering plan administrator for monitoring and ensuring efficient utilization of number?

Q6. What are your views on the pricing of numbering resources? If pricing is implemented should it be for all resources held by the service provider or only for future allocations?

Q7 Do you feel that an automated allocation of numbering resources using number management system software is necessary to speed up the process of allocation and collecting returns in an efficient and transparent manner? Do you feel that this work may be assigned to an independent body by the licensor? Please provide details.

Q8. Do you agree that a revised and new National Numbering Plan and a consolidated list of short code allocations should be issued? If so, what should be the periodicity?

Q9. Any other related issue.

List of Acronyms

Acronym	Description
AGR	Adjusted Gross Revenue
CC	Country Code
DoT	Department of Telecommunications
GSM	Global System for Mobile Communication
HLR	Home Location Register
ICT	Information and Communication Technology
IN	Intelligent Network
ISD	International Subscriber Dialing
ITU-T	International Telecommunication Union- Telecommunication Standardization Sector
LDCA	Long Distance Charging Area
LSA	Licensed Service Area
MNP	Mobile Number Portability
M2M	Machine to Machine
MSC	Mobile Switching Center
MSISDN	Mobile Station International Subscriber Directory Number
NANP	North American Numbering Plan
NDC	National Destination Code
NDCP-2018	National Digital Communication Policy-2018
NNP	National Numbering Plan
NPA	Number Plan Area
N(S)N	National Significant Number
OTT	Over the Top
P2P	Person to Person
PLMN	Public Land Mobile Network
PoI	Point of Interconnection
PSTN	Public Switched Telephone Network
SDCA	Short Distance Charging Area
SIM	Subscriber Identity Module
SMS	Short Message Service
SN	Subscriber Number
STD	Subscriber Trunk Dialing
TRAI	Telecom Regulatory Authority of India
TSP	Telecom Service Provider
USA	United State of America
VLR	Visiting Location Register

Government of India

Ministry of Communications

Department of Telecommunications

Access Services Wing

Sanchar Bhavan, 20, Ashoka Road, New Delhi-110001

No: 20-281/2010-AS-I Vol. XII (pt.)   Date:08.05.2019

To,

The Secretary,

Telecom Regulatory Authority of India,

Mahanagar Doorsanchar Bhawan,

Jawaharlal Nehru Marg, Old Minto Road,

New Delhi-110002

Subject: Seeking recommendations of TRAI on strategies of National Digital Communications Policy, 2018 - reg.

The National Digital Communications Policy, 2018 (hereinafter, referred to as, the NDCP, 2018) of the Government of India envisages, *inter-alia*, the following strategies under its 'Connect India' and 'Propel India' missions:
"

1. Connect India: Creating a Robust Digital Communications Infrastructure

...

Strategies:

1.1   Establishing a 'National Broadband Mission — Rashtriya Broadband Abhiyan' to secure universal broadband access

...

(j)   By Encouraging innovative approaches to infrastructure creation and access including through resale and Virtual Network Operators (VNO)

2. **Propel India: Enabling Next Generation Technologies and Services through Investments, Innovation, Indigenous Manufacturing and IPR Generation**

...

Strategies:

...

2.1   Catalysing Investments for Digital Communications sector:

...

(b)   Reforming the licensing and regulatory regime to catalyse Investments and Innovation, and promote Ease of Doing Business by:

    ...

    v.   Enabling unbundling of different layers (e.g. infrastructure, network, services and application layer) through differential licensing

    ...

(c)   Simplifying and facilitating Compliance Obligations by:

    ...

    v.   Reforming the Guidelines for Mergers & Acquisitions, 2014 to enable simplification and fast tracking of approvals

    ...

    viii.   Creating a regime for fixed number portability to facilitate one nation – one number including portability of toll free number, Universal Access Numbers and DID numbers

...

2.2   Ensuring a holistic and harmonized approach for harnessing Emerging Technologies

...

(e)   Ensuring adequate numbering resources, by:

    ...

    ii.   Developing a unified numbering plan for fixed line and mobile services

..."

2. Telecom Regulatory Authority of India is, hereby, requested to furnish recommendations, under the terms of the clause (a) of sub-section (1) of Section 11 of the Telecom Regulatory Authority of India Act, 1997 (as amended), in respect of the afore-mentioned items of the NDCP, 2018.

3. For sake of convenience, the strategies/ items under strategies of the NDCP, 2018, on which recommendation of TRAI are being sought, are summarized below:

(a)   Strategy 1.1 (j) of 'Connect India' mission,

(b)   Item (v) under Strategy 2.1 (b) of 'Propel India' mission,

(c)   Items (v) & (viii) under Strategy 2.1 (c) of 'Propel India' mission, and,

(d)   Item (ii) under Strategy 2.2 (e) of 'Propel India' mission.

4. This issues with the approval of the Secretary, Department of Telecommunications, Government of India.

(S.B. Singh)
Deputy Director General (AS)
Tel: 011-23036918

GOVERNMENT OF INDIA
MINISTRY OF COMMUNICATIONS & INFORMATION TECHNOLOGY
DEPARTMENT OF TELECOMMUNICATIONS
714, SANCHAR BHAVAN, 20, ASHOK ROAD, NEW DELHI-110001

No. 16-3/2003-BSII/Vol.VI   **Dated: 30ᵗʰ November, 2006**

OFFICE MEMORANDUM

SUBJECT: **ADDENDUM TO THE NATIONAL NUMBERING PLAN- 2003 (NNP-2003) – ALLOCATION OF SHORT CODES TO THE CONTENT PROVIDERS INCLUDING SMS BASED SERVICES.**

In supersession of this office O.M. of even No. dated 29ᵗʰ November, 2004 on the subject mentioned above, the undersigned is directed to state that for the proper conduct of telegraph, the Competent Authority has decided that all the Unified Access / Basic / Cellular Mobile Service providers must use the level '5' for allocation of short codes to the Content Providers including SMS based services within their network.

All other terms and conditions will be as per the guidelines issued in this regard.

-Sd/-   .
(Raj.K.Kataria)
Under secretary to the Govt. of India

Copy to:
1. **Secretary, Telecom regulatory authority of India.**
2. **Sr.DDG(TEC), Khurshid Lal Bhavan, Janpath, New Delhi.**
3. **DDG(DS) / (AS) / (CS)**
4. **All Unified Access / Basic / Cellular Mobile service Operators.**

Government of India
Ministry of Communications & IT
Department of Telecommunications
(Access Services Cell)
Sanchar Bhawan, 20 Ashoka Road New Delhi

File No: 800-22/2013-AS.II   Dated: 13.04.2015

To

All Access Service providers
(Including BSNL & MTNL)
COAI/ AUSPI

Subject: Amendment to National Numbering Plan 2003 for implementation of Full
Mobile Number Portability.

Undersigned has been directed to communicate following amendments to the National
Numbering Plan 2003 for the smooth implementation of Full Mobile Number Portability:

Dialling procedure for intra as well as inter service area Basic to Mobile calls and
Mobile to Mobile calls– The telecom service providers may allow dialling of intra service
area as well as inter service area calls to their subscribers without any prefix and/or by
prefixing '0' and/or by prefixing '+91'. However, intra service area calls shall mandatorily be
allowed without any prefix, as at present.

(P C Sharma)
Director (AS-II)

Copy to:
   1. Secretary, TRAI
   2. Sr. DDG (TERM), DoT
   3. DDG(CS)/DDG(DS)/DDG(LF-P)/DDG(LF-A)/DDG(A/C).
   4. All DDsG TERM.
   5. Director (AS-I)/ Director (AS-III)/ Director (AS-IV), Dir(AS-V), DoT
   6. MNP Service Providers
   7. DDG(IT) for uploading it on DoT website.

Ministry of Communications
Department of Telecommunications
Access Services Wing
20, Ashoka Road, New Delhi-110001

No.16-03/2015-AS-III(Part-III)/MSC Codes/19/748   Dated:11-08-2017

To,
    All Accesss Service Providers.

Subject: **Change of VLR criterion for allocation of MSC code numbering series on the basis of VLR-regarding.**

In supersession to DoT letter dated 16-16/2009-AS-III/38 dated 26.07.2011. No. 16-16/2009-AS-III/78 dated 27.09.2012 and dated 03.08.2015 in which VLR criterion was defined for allocation of MSC Codes to Telecom Service Providers along with instructions. The undersigned has been directed to issue following revised consolidated instructions with immediate effect:

(I)   The new MSC codes will be issued on the basis of VLR figure.

(II)   The total VLR figure (to be enclosed with requisition for new MSC codes) should be certified by concerned TERM Cell(s).

(III) The Access Service Provider(s) will first approach the respective LSA TERM Cell for certification of VLR figures and then submit their requisition for MSC codes to DoT HQ enclosing therewith the TERM Cells certified figures.

(IV)   The VLR database purging period should be fixed at 72 hours maximum.

(V)   The criteria for allocation of new MSC Codes is as below:

    (a)   Both attached and detached VLR figures are to be taken into account (added) to calculate the total VLR figure.

    (b)   In case of intra-circle roaming agreements. intra-circle in-roamers should be deducted whereas the intra-circle out-roamers shall be added to arrive at net VLR figures.

    (c)   Inter-circle in-roamers (of any opearator) will be deducted and inter-circle out- roamers will be added.

    (d)   The VLR figures may be taken as average of 7 days VLR count.

    (e)   Inclusion of Port-In number and exclusion of Port-Out number from the total MSC code series alloted till date to respective TSP.

(f) MSC codes will be issued if the VLR figure reached the count (taking para (a) to (e) into account as below:

S. No.	Numbers Allocated (N)	VLR Figure (V) as %age of Number Allocated (V/N)
1	Less than 3 million	Subject to minimum of 45%
2	3 Million to less than 6 Million	Subject to minimum of 50%
3	6 Million to less than 9 Million	Subject to minimum of 60%
4	9 Million to less than 15 Million	Subject to minimum of 65%
5	15 Million to less than 25 Million	Subject to minimum of 70%
6	25 Million and above	Subject to minimum of 75%

N=Number allocated
V=VLR figure

(Sanchit Kumar Garg)
ADG (AS-III)
Ph No. 23036444

Copy for kind information and necessary action, if any, to:

1. Secretary-TRAI, Mahanagar Doorsanchar Bhawan Jawaharlal Nehru Marg (Old Minto Road), New Delhi-110002
2. Sr. DDG, TEC, Gate No. 5, Khurshid lal Bhawan, Janpath, New Delhi-110001
3. Sr. DDG (TERM) with a request to send to send the certified copies to all TERM Cells.
4. CMD MTNL/CMD BSNL
5. COAI/AUSPI
6. Director (TERM)/ Director (Security-II), DoT HQ, New Delhi

Government of India
Ministry of Communications
Department of Telecommunications
Access Services Wing
20, Ashoka Road New Delhi-110001

No. 16-03/2015-AS-III(Part-III)/MSC Codes/27/8061   Dated: 08 /11/2017

To,

All Access Service Providers,

Corrigendum

Subjecr: Change of VLR criterion for allocation of MSC code numbering series on the basis of VLR-regarding.

In partial modification to DoT letter 16-03/2015-AS-III(Part-III)/MSC Codes/19/748 dated 11.08.2017, the undersigned is directed by competent authority to amend the VLR criterion to the earlier VLR criterion issued vide DoT letter No. 16-16/2009-AS-III/78 dated 27.09.2012 which is reproduced as follows:

S. No.	Numbers Allocated (N)	VLR Figure (V) as %age of Number Allocated (V/N)
1	Less than 3 million	Subject to minimum of 40%
2	3 Million to less than 6 Million	Subject to minimum of 45%
3	6 Million to less than 8 Million	Subject to minimum of 50%
4	8 Million	Subject to minimum of 55%
5	9 Million	Subject to minimum of 60%
6	10 Million to less than 15 Million	Subject to minimum of 63%
7	15 Million to less than 20 Million	Subject to minimum of 66%
8	20 Million to less than 25 Million	Subject to minimum of 68%
9	25 Million and above	Subject to minimum of 70%
N=Number allocated V=VLR figure		

2. Rest of the instructions contained in the letter dated 11.08.2017 as mentioned above will remain unchanged

3. It shall be applicable from immediate effect.

(Sanchit Kumar Garg)
ADG (AS-III)
Ph No. 23036444

Copy for kind information and necessary action, if any, to:

1. Secretary-TRAI, Mahanagar Doorsanchar Bhawan Jawaharlal Nehru Marg (Old Minto Road), New Delhi-110002
2. Sr. DDG, TEC, Gate No. 5, Khurshid Lal Bhawan, Janpath, New Delhi-110001.
3. Sr. DDG (TERM) with a requestto send the certified copies to all TERM Cells.
4. CMD MTNL/CMD BSNL
5. DG, COAI / SG, AUSPI
6. Director (TERM-I)/ Director (Security-II), DoT HQ, New Delhi.