BEFORE THE PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA

Order Instituting Rulemaking on the Commission's own Motion Into Competition for Local Exchange Service.	R.95-04-043 (Filed April 26, 1995)
Order Instituting Investigation on the Commission's own Motion Into Competition for Local Exchange Service.	I.95-04-044 (Filed April 26, 1995)

REPORT ON THE 415 AREA CODE

Submitted in Compliance with California Public Utilities
Code Section 7937, CPUC Decision 99-12-051, and Administrative Law Judge
Ruling Issued on January 18, 2000

CALIFORNIA PUBLIC UTILITIES COMMISSION
TELECOMMUNICATIONS DIVISION

Respectfully submitted
November 28, 2000

Jack Leutza, Director
Telecommunications Division
505 Van Ness Avenue, 3rd Floor
San Francisco, CA 94102

REPORT ON THE 415 AREA CODE

CALIFORNIA PUBLIC UTILITIES COMMISSION
TELECOMMUNICATIONS DIVISION

November 28, 2000

Prepared by Telecommunications Division:

Michael Amato	***Jack Leutza***
Victor Banuelos	***Robert Benjamin***
Mary Jo Borak	***Helen Mickiewicz***
Geraldine Carlin	***Eleanor Szeto***
Cherrie Conner	***Karen Watts-Zagha***
Melvin De La Cruz	***Maryam Ebke***
Risa Hernandez	***Sue Wong***

TABLE OF CONTENTS

Page

EXECUTIVE SUMMARY 1

FINDINGS 2

CHAPTER ONE: OVERVIEW OF NUMBERING 6

A. INEFFICIENT USE AND INCREASING DEMAND FOR NEW NUMBERS IN CALIFORNIA IS CAUSING AREA CODE PROLIFERATION 6

B. 415 HISTORY AND CPUC DECISIONS 7

1. Monthly Lottery Allocates Prefixes 8

C. CPUC EFFORTS TO RESOLVE AREA CODE PROLIFERATION 9

1. Number Pooling 9

2. Improved Number Inventory Management 10

3. CPUC Efforts at Federal Level 11

a. Authority Regarding Pooling 12

b. Authority Regarding Technology-Specific Area Codes 13

4. Utilization Studies 14

CHAPTER TWO: 3.9 MILLION UNUSED NUMBERS IN THE 415 AREA CODE 15

A. THE SCOPE OF THE UTILIZATION STUDY 15

1. Distribution Statistics of Prefixes 15

2. Companies Reporting 16

3. Non-Reporting Companies 16

B. NUMBERS AVAILABLE IN THE 415 AREA CODE 17

1. 3.9 Million Numbers Available in the 415 Area Code 17

C. ANALYSIS OF "VAILABLE" NUMBERS 20

1. Analysis of Wireline Carriers' Contamination Rates 20

2. Analysis of Wireless Carriers' Contamination Rate 21

3. Potential Block Contamination Abuses 23

4. Reclamation of Prefixes 24

D. ANALYSIS OF 3.8 MILLION "UNAVAILABLE" NUMBERS 25

1. 3.0 Million Assigned Numbers 26
a.Non –Working Wireless.....26
b.Eliminating Interim Number Portability Releases Numbers for Reallocation.....27
c.Expanded Use of the 555 Prefix Could Release Other Prefixes Dedicated to Special Uses.....28
2. Reserved Numbers Are a Potential Source of Additional Numbers 30
3. Restrictions on Administrative Numbers Could Yield More Numbers.....32
4. Intermediate Numbers 34
a. Type 1 Numbers 35
5. Aging Numbers 37
6. The Need to Audit the Data.....38

CHAPTER THREE: NUMBER POOLING AND OTHER NUMBER CONSERVATION MEASURES 39
A. INTRODUCTION.....39
B. NUMBER POOLING 39
1. More Accurate Forecasting Will Improve Number Pooling.....40
2. TD Finds 75 Additional Blocks for Number Pooling 41
C. LACK OF LOCAL NUMBER PORTABILITY STANDS AS A KEY BARRIER TO POOLING 42
D. UNASSIGNED NUMBER PORTING.....44
E. CONSOLIDATION OF RATE CENTERS TO MAXIMIZE NUMBER USE.....45
F. SHARING PREFIXES MAY YIELD MORE EFFICIENT NUMBER USE.....47

CONCLUSION.....50
APPENDIX A
APPENDIX B
APPENDIX C
APPENDIX D
APPENDIX E
APPENDIX F
APPENDIX G
APPENDIX H
APPENDIX I

EXECUTIVE SUMMARY

Like much of the country, California currently is experiencing a numbering crisis. From 1947 to January 1997, the number of area codes in this state increased gradually from 3 to 13. During the next three years, however, the number of area codes in California nearly doubled. By the end of 1999, California had 25 area codes statewide. The California Public Utilities Commission (CPUC) recently has implemented several measures intended to ensure efficient use of telephone numbers. Without these measures, the CPUC projects that 16 more area codes would need to be opened by the end of 2002, resulting in a statewide total of 41 area codes.

This study recounts the history of the 415 area code, from its creation in 1947 through the various splits to its present status, covering San Francisco and most of Marin County. This report should be viewed in a broader context than the facts pertaining solely to the 415 area code. The report evaluates the status of number availability in the 415 area code, and discusses the various state and federal policies which govern number use in California and nationwide. In addition, the report analyzes number use by carrier category and identifies what measures the CPUC can employ in the 415 and other area codes to improve efficiency of number use in order to avoid prematurely opening new area codes. Data is self-reported by the companies; the CPUC staff has not audited any 415 utilization data submitted for this study and report.

The utilization study sheds new light on the numbering crisis in the 415 area code. The data reveals that despite increasing demand for numbers, the 415 area code is not fully utilized. The study found that of the 7.7 million useable numbers in the 415 area code, approximately 3.9 million, or roughly half, presently are not in use. The data further establishes that the 415 area code possesses considerable room for growth, and thus, aggressive measures such as splits or overlays are not yet warranted in the 415 area code. The report further urges the CPUC to seek from the FCC authority to implement Unassigned Number Porting (UNP) as a means to more efficiently use numbers still available in the 415 area code.

This report is filed in compliance with CPUC Decision (D.) 99-12-051, and with AB 406, enacted by the California Legislature in the 1999 legislative session. (Chapter 99-809, 1999.) AB 406, codified as Public Utilities Code Section 7937, requires the CPUC to obtain historical telephone number use data from every telecommunications company in California. The CPUC's Telecommunications Division (TD) first obtained and analyzed data from the 310 area code in Los Angeles late in 1999, and produced a utilization report on 310 in March, 2000. This report on the 415 area code is one of a group of reports covering specific area code number utilization levels.

FINDINGS

The 415 area code contains approximately 7.7 million telephone numbers available for consumer use. These numbers are available to telecommunications companies which obtain the numbers from the North American Numbering Plan Administrator (NANPA),[1] and in turn, assign the numbers to their customers for their immediate use. Alternatively, companies may reserve numbers for future use, or retain numbers for some internal (administrative) use. Some companies provide blocks of numbers to resellers or "dealers", which then assign those numbers to customers. The FCC deems numbers which companies allocate to resellers to be "intermediate" numbers. In addition, each assigned number, after disconnection, must "age" during a transition period before assignment to the next customer. Many companies have inventories of numbers in the “aging” process. Finally, some numbers in this area code are not available for public use, as they have been set aside for emergency purposes, for technical network support, or for other reasons.

The FCC has determined that numbers in these five categories – assigned, administrative, reserved, intermediate, or aging – are unavailable, either because they are already in use or are designated for some present or future use. Of the nearly 4 million available numbers, approximately one million have been set aside by the CPUC to use in

[1] NANPA is a role performed by NeuStar, Inc. The FCC chose NeuStar, formerly Lockheed Martin, to perform the functions of numbering administration and area code changes nationwide.

a lottery for companies seeking numbers, and for donation to the 415 number pool. [2] Companies possess the remaining 2.8 million numbers. Wireline carriers, such as Pacific Bell and many competitive local exchange carriers, hold roughly 2.1 million available numbers, while wireless carriers hold approximately 700,000 available numbers.

At the same time, the 415 study finds that under FCC rules, about 2.2 million numbers cannot be contributed to the 415 number lottery, nor can they be contributed to the existing 415 number "pool" for reassignment to other companies. The FCC has determined that wireless carriers do not have to participate in the pool at this time. [3] In addition, the FCC has determined that the CPUC may only require wireline carriers to contribute to a number pool those blocks of 1,000 numbers that are 10% or less contaminated, [4] meaning those blocks in which only 100 or fewer numbers are unavailable. However, wireline carriers may also keep a portion of the 10% or less contaminated blocks if those are needed for use within six months. Thus, 2.2 million numbers in the 415 area code are available only to the companies holding those numbers because they are held by wireless carriers, are in blocks that are more than 10% contaminated, or are in blocks 10% or less contaminated but kept for six-month inventory. The study further finds that of the 3.9 million numbers not in use, about 3.1 million could be made available to companies through pooling if a) the companies donated blocks with higher contamination levels to the pool, and b) wireless carriers were required to participate in the 415 number pool. The first table below illustrates the current distribution of numbers. The second table shows the distribution that would occur if all the recommendations in this report were implemented.

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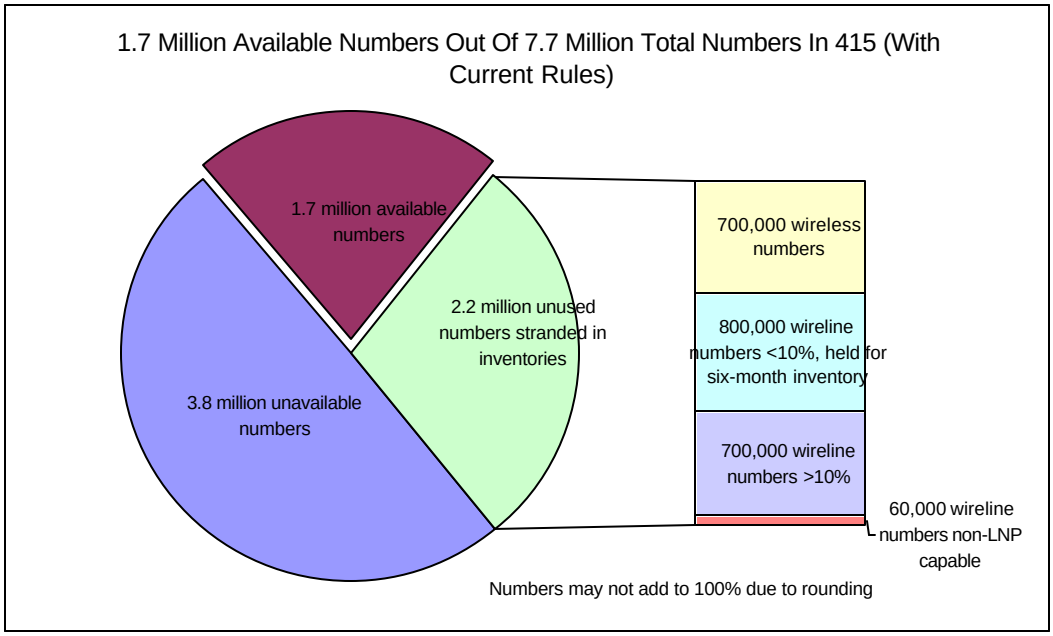
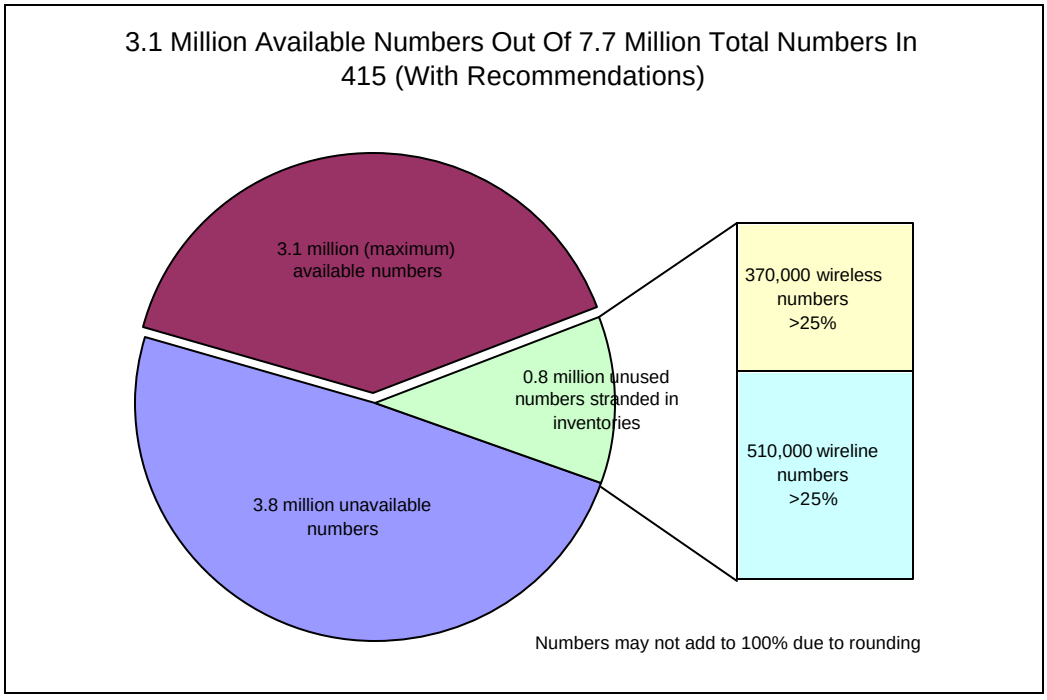
[2] Historically, telephone numbers have been allocated to companies in blocks of 10,000, as a complete prefix, such as (415)703-XXXX. Number pooling allows companies to obtain numbers in blocks of 1,000 or even fewer numbers.

[3] At present, only wireline carriers are required to participate in number pooling. The FCC has granted most wireless carriers an extension of time, until November, 2002, to implement the technology that will support number pooling. The FCC has permanently exempted paging companies from implementing the technology necessary to pool.

[4] The percentage of numbers in use in a particular block of 1,000 numbers is referred to as the "contamination" level.


1.7 Million Available Numbers Out Of 7.7 Million Total Numbers In 415 (With Current Rules)
1.7 million available numbers
2.2 million unused numbers stranded in inventories
3.8 million unavailable numbers
700,000 wireless numbers
800,000 wireline numbers <10%, held for six-month inventory
700,000 wireline numbers >10%
60,000 wireline numbers non-LNP capable
Numbers may not add to 100% due to rounding


3.1 Million Available Numbers Out Of 7.7 Million Total Numbers In 415 (With Recommendations)
3.1 million (maximum) available numbers
0.8 million unused numbers stranded in inventories
3.8 million unavailable numbers
370,000 wireless numbers >25%
510,000 wireline numbers >25%
Numbers may not add to 100% due to rounding

Finally, the study notes that companies identify 3.8 million numbers as unavailable. TD staff recommends specific measures the CPUC can employ to ensure that companies use those “unavailable” numbers more efficiently. Given the near doubling of the number of area codes in California, from 1996 to 1999, this vital public resource should be used as efficiently and effectively as possible. The CPUC and the telecommunications industry should strive to minimize the quantity of numbers left “stranded” in company inventories. The 415 Area Code Report recommendations are summarized in Appendix I.

CHAPTER ONE: OVERVIEW OF NUMBERING

A. Inefficient Use and Increasing Demand for New Numbers in California Is Causing Area Code Proliferation

California is currently experiencing an explosive demand for telephone numbers and area codes. The increased demand for numbers is due to many factors, including competition for local phone service, as well as the popularity of faxes, pagers, cell phones, internet services, etc. California's robust economy and the growth in the state's population also contribute to the increased demand for telephone numbers. This increase in demand is complicated by a number allocation system dating from the 1940's that is inefficient in today's competitive marketplace.

Prior to 1997, one phone company[5] provided local telephone service to all customers in a particular area and new area codes were opened as the population grew. The number of California area codes rose steadily from 3 in 1947 to 13 in 1992, and stayed at that level until January 1997. The Telecommunications Act of 1996 brought competition to local telephone service and competitive local phone companies[6] began to enter the marketplace, each requiring its own stock of numbers. The traditional system of number allocation was not designed to provide telephone numbers to more than one company.

In the past, when telecommunication companies needed telephone numbers to serve their customers, they received blocks of 10,000 numbers, i.e. prefixes. Because companies were assigned blocks of 10,000 numbers, they may have been assigned more numbers than they needed. For example, under this system, a company with only 500 customers would have received a 10,000 number block, the same quantity of numbers a company with 9,500 customers would receive. Thus, numbers are taken in these large blocks, creating an artificial demand for more numbers, which in turn fuels the need to open more area codes. The need to assign 10,000 numbers is a practice from the past

[5] Today called the Incumbent Local Exchange Carrier (ILEC)

[6] Today called Competitive Local Exchange Carriers (CLEC)

when one telephone company provided service to all customers in its territory. Today, with over 200 telecommunications companies in the state needing numbers to serve customers, and with the limited quantity of numbers available in each area code, this process is no longer an efficient way to allocate numbers.

The rise in demand for numbers combined with the inefficient allocation system for numbers has forced the rapid opening of new area codes throughout the state. Since 1997, the number of area codes has nearly doubled to 25. Unless major changes occur, the CPUC projects that 16 more area codes would need to be opened in California by 2002. With more and more companies needing numbers of their own, new area codes are not necessarily the best solution.

B. 415 History and CPUC Decisions

The 415 area code is a classic example of area code proliferation in California. One of the first three area codes in California in 1947, the 415 area code originally covered all of central California. Today, the 415 area code encompasses only San Francisco and portions of Marin County. The geographic area comprising the original 415 area code is now divided into seven additional area codes, including 209, 408, 559, 831, 510, 925, and 650.

Despite the introduction of seven area codes between 1958 and 1997 to provide new numbers to the 415 area code, the North American Numbering Plan Administrator (NANPA) determined in late 1997 that the 415 area code was running short of numbers. In response to the NANPA's determination that the CPUC must act to provide additional numbers for phone company use, the CPUC approved an area code overlay on April 1, 1999. In an overlay, a new area code is created covering the same geographical area as the existing area code. Under CPUC and Federal Communications Commission (FCC) rules, all customers with numbers in both the new and old area codes are required to dial 1 plus the area code plus the seven digit number (known as 1 + 10 digit dialing) to reach any other number in either of the two area codes. The new area code was scheduled to be overlaid on the 415 area code on October 21, 2000, with mandatory 1 + 10 digit dialing to begin on July 24, 2000.

When the first overlay and 1 + 10 digit dialing were implemented in the 310 area code (located in the Los Angeles area) in April of 1999, customers expressed strong objections to the overlay and to the requisite 1 + 10 digit dialing. The CPUC halted the 310 overlay in September. In December of 1999, by Decision 99-12-051, the CPUC suspended all overlays previously approved, which included the overlay in the 415 area code. In that same decision, the CPUC required its Telecommunications Division (TD) staff to study number use to determine the quantity of available, unused numbers in the 415 area code. This report fulfills that requirement.[7]

1. Monthly Lottery Allocates Prefixes

In all the area codes in danger of running out of numbers, the CPUC has instituted a lottery process to fairly allocate the remaining prefixes among phone companies when demand exceeds supply. The 415 lottery began in October 1996. Currently, the CPUC distributes three prefixes (two initial and one growth[8]) in the monthly 415 lottery. Each company submits applications for initial and growth prefixes to the NANPA Code Administrator. If more applications are received than can be satisfied in that month, the first applicants chosen by random drawing are assigned a prefix and the remaining applicants are placed on a priority list and receive prefixes in one of the following months' lotteries in the order they were drawn. Once every company requesting a prefix has received one, a new drawing is held and additional companies are eligible to receive prefixes. Twenty-nine prefixes have been allocated in the 415 area code through this process between January 1, 2000 and August 31, 2000.

[7] In addition, the California state legislature enacted Section 7937 of the California Public Utilities Code. Effective on January 1, 2000, Section 7937 requires the CPUC to prepare and submit to the Legislature, by July 1, 2001, a study of the telecommunications industry's usage rates of telephone numbers in all California area codes. This report also complies with that legislative requirement with respect to the 415 area code.

[8] A company's request for its first prefix in the rate center is considered an initial request; requests for additional prefixes are considered growth requests.

C. CPUC Efforts to Resolve Area Code Proliferation

Recognizing the substantial social and economic burdens associated with constant area code changes, the CPUC has taken steps to resolve the numbering crisis. Responding to widespread public outcry over the proliferation of new area codes, the CPUC suspended, beginning in December 1999, all plans for new area codes previously approved. In July 2000, the CPUC adopted number conservation measures, including establishming number pooling trials, fill rates, and sequential numbering.

1. Number Pooling

The CPUC, with FCC approval, has begun pooling trials in four area codes, in order to boost the efficiency of phone number allocation. Number pooling allows telephone companies to receive numbers in smaller blocks than the traditional 10,000 numbers, enabling multiple providers to share a prefix, thereby utilizing this limited resource much more efficiently. The technology that enables the network to support the assignment of smaller blocks is referred to as Local Number Portability or LNP.[9] LNP was originally mandated by the FCC as a means to enable customers to retain their telephone numbers when they switch telephone service to another local provider. This same platform is utilized for number pooling. The FCC had required all wireline carriers to become LNP-capable by the end of 1998 in the top 100 Metropolitan Statistical Areas (MSAs) in the country. Thirteen of the top 100 MSAs are located in California; the 415 area code is in one of them.[10]

Though LNP technology has existed for several years, the FCC later granted cellular and PCS companies an extension of time until November 2002 to become LNP-capable. The FCC gave paging companies a permanent exemption from the LNP requirement.[11] Thus, at this time, only wireline carriers[12] can participate in number pooling. In the area codes with number pooling, wireline carriers participate in pooling

[9] See Chapter Three of this report for a discussion of LNP.

[10] FCC's Opinion and Order on Telephone Number Portability FCC 97-74, issued March 6, 1997

[11] Cellular companies, PCS companies, and paging companies comprise the wireless category.

[12] ILECs and CLECs

and wireless carriers participate in the lottery. In the remaining area codes, all phone companies participate in the lottery.

The CPUC has been aggressively setting up number pools. On July 29, 2000, the CPUC initiated a mandatory number pooling trial, the second number pooling trial in the state, for the 415 area code. Pursuant to Assigned Commissioner's Ruling dated April 21, 2000, the CPUC placed 36 prefixes on hold to provide an initial inventory of codes for this pool. All companies with numbers in 415 are required to donate 1,000-number blocks to the pooling administrator. Under the number pooling program, all LNP-capable carriers receive numbers in blocks of 1,000 in the 415 area code on an as-needed basis. There is no rationing process in the pooling trial and the blocks received can be put into service almost immediately upon receipt. As of the end of August 2000, LNP-capable carriers had donated 640 blocks, or 640,000 numbers, to the pool. A complete discussion of the status of the 415 pooling trial is found later in this report.

2. Improved Number Inventory Management

While the pooling trials have improved the efficiency of the distribution of numbers to companies, companies have not had strong incentives to efficiently manage the numbers already allocated to them. Thus the CPUC ordered companies to improve number inventory management with measures including rules on fill rates and sequential numbering.

In July 2000, the CPUC issued Decision 00-07-052, which extended number conservation measures adopted in the 310 area code to other area codes within California. These number conservation measures include the following:

- Companies are required to return to the NANPA any prefix held for more than six months without being used.
- "Imminent exhaust criteria" are established in all area codes with lotteries or pooling trials. In each rate center in which companies request additional numbers, they must as a prerequisite supply NANPA with a form demonstrating they will be out of numbers within three months.

? Companies must satisfy a minimum 75% fill rate requirement before being eligible to request a growth code in any area code in rationing and before being eligible to receive a thousand-block through the number pool. Companies must assign numbers in thousand block sequence, moving to the next block only once a 75% fill rate has been attained in the prior block.

TD anticipates these policies will potentially free more numbers for use in number pooling, to be allocated through the lottery, or to be otherwise used by companies. Indeed, these measures together with the effects of number pooling have already achieved some positive effects. For example, since the CPUC extended the 75% fill rate and imminent exhaust rules to all area codes, including 415, CPUC staff has observed that the demand for growth prefixes in each month's lottery has declined. Further evidence of the effectiveness of the CPUC's number conservation policies is the recent increase in the number of remaining prefixes in the 415 area code. As of April 30, 2000, there were 72 remaining prefixes available for assignment in the 415 area code. That number increased to 89 prefixes by August 2000, with the CPUC working with companies to reclaim excess prefixes held by companies. These 89 prefixes are in addition to the 36 prefixes set aside for the 415 pool. Because the CPUC has instituted changes to number allocation rules, and because prefixes have been reclaimed from companies, there are four more prefixes available for assignment today compared to December 1999.

3. CPUC Efforts at Federal Level

The FCC has exclusive jurisdiction over numbering in the U.S. Therefore, the CPUC's number conservation policies (pooling, fill rates, and sequential numbering) are governed by the FCC's delegation of authority to the states. In recognition of the severity of the numbering crisis in California, the CPUC has aggressively petitioned the FCC for additional authority. As a result, the FCC has delegated authority to plan and implement area code changes, as well as authority to implement number conservation measures.

a. Authority Regarding Pooling

On April 26, 1999, the CPUC filed a petition with the FCC requesting authority to institute number pooling trials and other number conservation measures within the state to better manage this public resource. On September 15, 1999, the FCC granted that petition, allowing the CPUC to institute mandatory number pooling on a trial basis, deploying it sequentially in one MSA at a time. When the FCC granted the CPUC the authority to deploy various numbering resource optimization strategies, including the authority to institute thousand-block numbering pooling trials, it also clarified that California's authority will be superseded by future national measures adopted by the FCC.

On March 31, 2000, the FCC released the Numbering Resource Optimization Report and Order and Further Notice of Proposed Rulemaking (NRO Order).[13] The NRO Order sets forth rules for defining numbers, forecasting, tracking and auditing companies' use of numbers, and for conservation measures associated with number usage, including but not limited to number pooling. The definitions for numbers and timelines for aging and reserved numbers that were adopted in that order have been incorporated into the utilization data contained herein.

With the release of the NRO Order, the FCC adopted a number of administrative and technical measures that will allow it to monitor more closely the way numbering resources are used and to promote more efficient use of numbering resources. In particular, the FCC adopted a nationwide system for allocating numbers in blocks of one thousand, rather than ten thousand, wherever possible, and announced its intention to establish a plan for national rollout of thousands-block number pooling.

Because the FCC recognized that state thousand-block number pooling trials underway might not conform to the national standards set forth in the NRO Order, the FCC gave state commissions until September 1, 2000 to conform their thousands-block number pooling trials to the national framework. One requirement imposed in California

[13] Report and Order and Further Notice of Proposed Rulemaking, CC Docket No. 99-200 FCC 00-104 (released March 31, 2000).

which differs from the national standards is the requirement that companies meet a 75% fill rate in each block before they may receive an additional block from the pooling administrator. The CPUC recognized the 75% fill rate as a critical factor in the success of the 310 pooling trial and petitioned for a waiver of compliance with the national rules. On August 31, 2000, the FCC issued an order granting the CPUC authority to continue to use its pooling rules until the FCC decides on the merits of the petition, or until December 31, 2000, whichever occurs sooner. This allows California to continue applying the 75% utilization rate in its number pooling efforts.

The NRO further constrains the CPUC by concluding that the rollout of thousand-block number pooling should first occur in area codes that are located in the largest 100 MSAs. In its comments prior to the release of the NRO, the CPUC had argued that California would be precluded from exploring whether number pooling could alleviate the crises for number resources in many parts of the state that are located outside the top 100 MSAs. The CPUC believes the FCC should delegate authority to the states to order deployment of LNP. This grant of authority to California would make pooling possible throughout the state.

b. Authority Regarding Technology-Specific Area Codes

Currently, state commissions are constrained by the FCC from establishing an area code specifically for wireless telecommunications services. On April 26, 1999, the CPUC filed another petition with the FCC requesting that the CPUC be granted authority to create service-specific or technology-specific area codes. In the 415 area code, there are 21 wireless carriers holding 157 prefixes. If the CPUC were allowed to create a separate area code for those companies, the 157 prefixes in the 415 area code could be reassigned to other phone uses, thus prolonging the life of the existing area code. To date, the FCC has not acted on the CPUC's petition.

On September 28, 2000, Governor Davis signed into law Senate Bill (SB) 1741, authored by Senator Bowen. SB 1741 requires the CPUC to request authority from the FCC to require telephone corporations to establish technology-specific area codes based on wireless and data

communications, and to permit 7-digit dialing within both that technology-specific area code and the underlying pre-existing area code or codes. The bill requires the CPUC to use any authority so granted unless it makes a specified finding that there is reason not to do so. The legislation also prohibits the CPUC from implementing any authority granted by the FCC in a manner that impairs number portability. The Petition that the CPUC filed with the FCC in April 1999 fulfills the technology-specific area code requirement set forth in the bill.

The bill also prohibits the CPUC from approving new area codes unless a telephone utilization study has been performed and all reasonable telephone number conservation measures have been implemented. This utilization study fulfills the telephone utilization study portion of SB 1741.

4. Utilization Studies

Before requiring the residents and businesses of the 415 area code to undergo another area code change, the CPUC recognized the necessity of determining the amount of telephone numbers that are in use and yet to be used. To that end, the CPUC instituted a 415 utilization study and required companies to provide usage data to the CPUC as of April 30, 2000. The TD contracted with NeuStar to collect the data, which submitted the aggregated data in its entirety to TD on August 18, 2000. The study parameters and filing requirements appear in Appendix A, as well as a list of companies who have been allocated numbers in the 415 area code.

CHAPTER TWO: 3.9 MILLION UNUSED NUMBERS IN THE 415 AREA CODE

Of the 7.7 million numbers in the 415 area code, companies hold 6.6 million. The other 1.1 million numbers have yet to be assigned to companies. The CPUC's utilization study found that of the 6.6 million numbers held by companies, 2.8 million remain unused in their inventories. Therefore, 3.9 million numbers in the 415 area code remain unused. A portion of these unused numbers can be made available for use by all companies, either through pooling or through the monthly lottery allocation process. In addition, companies have reported 3.8 million numbers as unavailable. A portion of these unavailable numbers can be used more efficiently if the recommendations contained in this report are implemented.

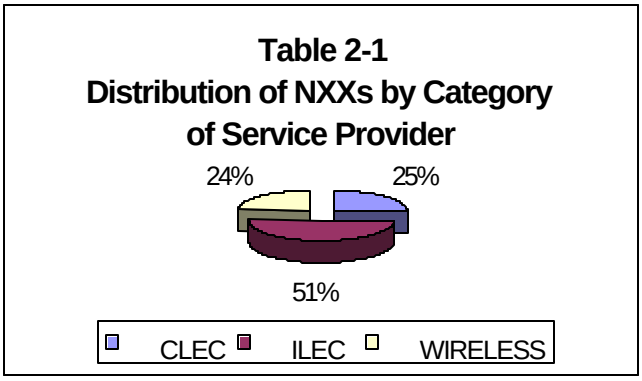
A. The Scope of the Utilization Study

1. Distribution Statistics of Prefixes

The CPUC asked forty-nine companies, holding 658 prefixes (6.6 million numbers) in the 415 area code, to report their utilization data with a reporting cut-off date of April 30, 2000. Table 2-1 shows the distribution by incumbent local exchange carriers (ILECs), competitive local exchange carriers (CLECs)[14], and wireless carriers in 14 rate centers and one special code area. [15]

[14] Wireline carriers include both ILECs and CLECs.

[15] The one special code area is used for directory assistance, i.e. a special use NXX code described in Section D.1.c of this chapter.



2. Companies Reporting

Of the 49 companies, 45 submitted utilization data; one company submitted data too late to be included in the summaries provided by NeuStar. Staff has considered this late filer in its analysis.

3. Non-Reporting Companies

The remaining four companies holding 21 prefixes in the 415 area code are no longer offering service in the 415 area code. CRL Network Services and GTE Communications Corporation wrote to NeuStar that they were returning all their prefixes in California and the 415 area code, respectively. Geotek Communications verbally informed NeuStar that it is no longer conducting business in California. NeuStar was notified that Conxus Spectrum is in bankruptcy.

NANPA has confirmed that GTE Communications Corp. and CRL Network Services have returned all nineteen of their 415 prefixes. However, Geotek and Conxus, each holding one prefix, have not yet returned their prefixes.

<u>Recommendation for Prefixes Held by Companies No Longer in Service</u>

? *For the prefixes not yet returned, the CPUC should take action to require NANPA to reclaim the prefixes.*

B. Numbers Available in the 415 Area Code

1. 3.9 Million Numbers Available in the 415 Area Code

The 415 area code has 3.9 million unused numbers. Of these unused numbers, TD found that companies held 2.8 million numbers in their inventories.[16] These numbers held in inventory are currently not used for any purpose but held in anticipation of future need. The remaining 1.1 million unused numbers are not yet assigned to companies: 360,000 numbers have been set aside for number pooling[17] and 720,000 numbers are available for allocation in the 415 monthly lottery. The breakdown of available numbers is shown in the table below.

Table 2-2

Summary of Available Numbers

Wireline Carriers	2,144,757
Wireless Carriers	650,906
Type 1 Carriers[18]	48,061
Total Available/Unused Numbers Held by Carriers	2,843,724
Numbers Set Aside for the 415 Pooling Trial	360,000
Numbers Available for the 415 Lottery	720,000
Total Available Numbers in the 415 Area Code	3,923,724

Not all of the 3.9 million unused numbers are immediately available to every company that wants numbers. Of the 3.9 million, a maximum of 1.7 million numbers[19]

[16] A detailed break-down of the available 2.8 million numbers is shown in Table B-1 in Appendix B.

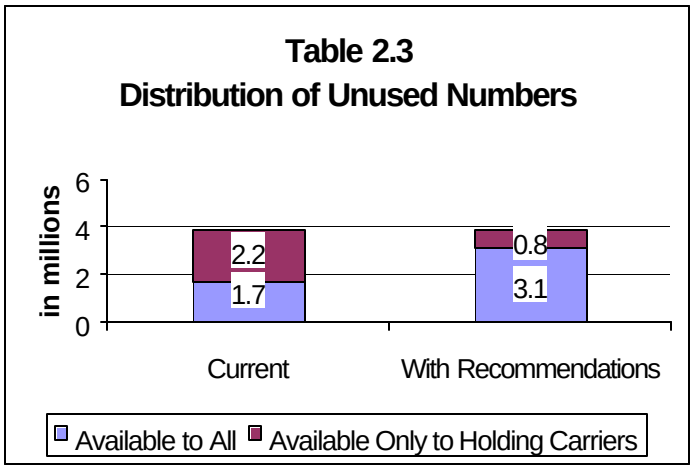
[17] Currently, a total of 1,000 thousand-number blocks are available for the 415 number pooling trial. The 1,000 blocks include 360,000 numbers from the 360 blocks which were set aside by the CPUC as well as 640 blocks donated by carriers.

[18] Type 1 carriers are not considered wireline or wireless companies. Type 1 numbers are programmed in the wireline company's end office, but are used by a wireless company.

[19] 1.7 mm numbers is comprised of 640,000 donated by companies, plus 360k initially set aside by the

(continued on next page)

are available to all companies via the pooling trial or the lottery. The remaining 2.2 million numbers are only available to the companies who hold them. As shown in the table below, the CPUC could shift the availability of numbers from one category to another by adopting the recommendations [20] in this report. Of the 3.9 million unused numbers, those actions could result in making a maximum of 3.1 million numbers [21] available to all companies with the remaining 0.8 million numbers available to the companies who hold them.



Current technology requires a company to be LNP-capable in order to donate numbers for another company to use. All wireline carriers in the 415 area code are required to be LNP capable.[22] Wireline carriers hold 2.1 million unused numbers in the 415 area code. In order for the unused numbers to be retrieved from company

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(continued from previous page)
CPUC for pooling, plus 720K available through lottery.

[20] Recommendations dealing with receiving authority from the FCC to increase contamination threshold rates (25%) for pooling purposes, recovering blocks from special use codes, and recovering unused numbers from non-LNP capable carriers and Type 1 carriers as described later in this report.

[21] See Table B-2 in the appendix for a detailed breakout of the 3.1 million numbers.

[22] Although all wireline carriers are required to be LNP capable, two wireline carriers in the 415 area code remain non LNP-capable.

inventories, the FCC requires these unused numbers to be retrieved from blocks which are 10% or less contaminated.[23] 1.4 million of wireline companies' 2.1 million unused numbers are contained in 1,444 thousand-blocks held by LNP-capable carriers and are 10% or less contaminated. However, not all of these 1.4 million numbers can be retrieved from companies' inventories because companies need to have enough numbers to meet anticipated future need.[24] Both the CPUC and the FCC have determined that six-months of inventory is a reasonable quantity to hold for future use. Of these 1,444 thousand-blocks eligible for donation, 804 blocks remain with companies for their six-month inventory while 640 blocks are now available for pooling.

The remaining 724,000 of the 2.1 million unused numbers cannot be retrieved, either because the numbers are in blocks greater than 10% contaminated or because they are in non LNP-capable blocks. However, companies can immediately use these numbers to provide service to their customers or meet other needs. Wireline carriers hold 664,000 numbers in blocks that are more than 10% contaminated.[25] Non-LNP capable carriers hold 50,000 of the 2.1 million unused numbers. Special use codes[26] are generally not LNP capable and constitute 10,000 of the 2.1 million unused numbers.

Wireless carriers hold 651,000 unused numbers in the 415 area code. Of these unused numbers, 312,000 are in blocks that are 10% or less contaminated, while 339,000 numbers are in blocks greater than 10% contaminated. Until wireless carriers become LNP-capable in November 2002, none of these numbers may be reallocated to other companies. In the interim, wireless carriers may assign these numbers to their own customers.

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[23] 10% or less contaminated means that out of 1000 numbers in a block, 100 numbers or less have been classified as unavailable.

[24] Future need may include serving new customers or offering new services.

[25] See Table B-1 in Appendix B. The 663,984 is comprised of 43,503 which are in blocks that are 10-15% contaminated, 51,597 from 15-20% contaminated, 32,870 from 20-25% contaminated, and 536,014 numbers which are in blocks that are more than 25% contaminated. Later in this chapter, TD recommends additional steps that can be implemented to make more of the 663,984 numbers available for number pooling.

[26] For a discussion of numbers held for special uses, see Section D.l.c of this chapter.

C. Analysis of "Available" Numbers

1. Analysis of Wireline Carriers' Contamination Rates

The CPUC requires each company participating in the 415 number pool to donate blocks that are 10% or less contaminated, excluding those retained for the six-month inventory.[27]

TD analyzed the 415 utilization data to determine the availability of numbers within blocks if different contamination thresholds were employed in the number pool. The following table summarizes available numbers by contamination rates by rate center for wireline carriers.

Table 2-4

Available Numbers by Percentage Contamination for LNP Capable Wireline Carriers

Rate Center	0%	>0%-10%	>10%-15%	>15%-20%	>20%-25%
Belvedere	23,000	2,997	898	800	0
Corte Madera	34,000	8,799	1,768	800	792
Ignacio	51,000	10,780	898	800	1,581
Inverness	35,000	3,976	898	800	0
Mill Valley	53,000	14,677	1,784	1,600	1,597
Nicasio	34,000	6,779	898	0	0
Novato	40,000	16,296	1,754	1,600	3,121
Point Reyes	37,000	9,616	898	0	2,299
San Rafael	108,000	41,346	4,443	6,506	4,710
Sausalito	55,000	24,176	898	1,601	0
San Francisco Central	349,000	87,064	21,225	29,849	13,274
San Francisco Juniper	106,000	52,176	1,761	3,241	3,128
San Francisco Montrose-Evergreen	111,000	45,704	4,482	4,000	2,368
Stinson Beach-Bolinas	51,000	9,643	898	0	0
Total	1,087,000	334,029	43,503	51,597	32,870

The first two columns of Table 2-4 show the potential numbers available to the pooling trial, except for those numbers kept for companies' six-month inventory, under current rules. Available numbers in one rate center cannot be used in another rate center.

[27] INC's Thousand Block (NXX-X) Pooling Administration Guidelines, dated January 10, 2000, state that carriers should donate specified thousand blocks.

Table 2-4 shows that all rate centers have available numbers that companies could donate to the pool.

The last three columns of Table 2-4 capture available numbers in blocks that are greater than 10% contaminated but no more that 25% contaminated. Under the current 415 number pool rules, companies retain thousand number blocks that are more than 10% contaminated. Increasing the contamination rate threshold from 10% to 25% would potentially free up an additional 128,000[28] numbers for use in the number pool. TD cautions that although Table 2-4 shows potential results from increasing allowable contamination levels, further analysis and input from the industry may be necessary to determine accurately the quantity of additional numbers that can be added to the pool while still leaving companies with a six-month inventory.

As shown by Table 2-4 and also shown graphically in Table B-3 of Appendix B, each rate center has available numbers from blocks of differing contamination levels up to 25%. The table shows that if the contamination level was increased from 10% to 25%, more unused numbers exist in each rate center that potentially can be donated to the pool.

Recommendation from Block Contamination Analysis of Wireline Carriers

? *The CPUC should petition the FCC to increase the contamination level for pooling to 25%. If the FCC grants the petition, the CPUC should increase the maximum contamination level of donated blocks from 10% to 25% for all LNP capable carriers.*

2. Analysis of Wireless Carriers' Contamination Rate

Under current FCC rules, cellular and PCS companies are exempt from number pooling until November 2002 when they must become LNP-capable. The FCC has indefinitely exempted paging companies from becoming LNP capable.[29] Table 2-5 shows available numbers in differing contamination levels held by wireless carriers. Wireless carriers hold 312,000 available numbers in blocks which are 10% or less

[28] Additional numbers from the last three columns of Table 2-3: 43,503+51,597+, 32870=128,000

[29] Of these 368,000 unused numbers held by wireless carriers, TD estimates that 129,000 are held by the paging companies. See Table B-2 of Appendix B.

contaminated as shown in the first two columns of Table 2-5. Wireless carriers also have 56,000 available numbers in blocks with contamination levels greater than 10% but less than 25% as indicated by the last three columns of Table 2-5.

Table 2-5

Available Numbers by Percentage Contamination for Wireless Carriers

Rate Center	0%	>0%-10%	>10%-15%	>15%-20%	>20%-25%
Belvedere	5,000	2,991	0	0	0
Corte Madera	9,000	0	0	0	0
Ignacio	0	0	0	0	0
Inverness	9,000	0	0	0	0
Mill Valley	9,000	0	0	0	0
Nicasio	0	0	0	0	0
Novato	2,000	7,877	892	0	790
Point Reyes	0	0	0	0	0
San Rafael	37,000	14,802	864	0	3,068
Sausalito	9,000	904	1,741	829	0
San Francisco Central	122,000	58,891	13,081	14,840	16,214
San Francisco Juniper	7,000	1,997	0	808	781
San Francisco Montrose-Evergreen	5,000	10,465	892	801	0
Stinson Beach-Bolinas	0	0	0	0	0
Total	214,000	97,927	17,470	17,278	20,853

Because the FCC has granted wireless carriers an extension of time to implement LNP, no wireless carriers serving the 415 area code are capable of implementing LNP. Thus, wireless carriers cannot participate in number pooling at this time, resulting in 368,000 unused numbers in blocks between 0% to 25% contaminated in the 415 area code.

Recommendations from Block Contamination Analysis for Wireless Carriers

- *When cellular and PCS companies become LNP capable in November 2002, the CPUC should direct those wireless carriers to donate to and participate in the pool.*
- *The CPUC should adopt a 25% contamination threshold for donated blocks from wireless carriers to the pool.*

? *The CPUC should solicit comments on the feasibility of paging companies becoming LNP capable and participating in pooling.*

? *If deemed feasible, the CPUC should petition the FCC to rescind the paging companies' permanent exemption on becoming LNP capable.*

3. Potential Block Contamination Abuses

When blocks are slightly more than 10% contaminated, those blocks cannot be donated to the pool. TD found instances where companies contaminated blocks just above 10%. The CPUC's rules on sequential numbers and fill rate practices promulgated in Decision 00-07-052 are designed to prevent this problem from occurring in the future. Fill rates mitigate contamination by requiring companies to use contaminated blocks up to 75% before they can receive additional blocks. Sequential numbering minimizes contamination by requiring companies to begin assignment in the next thousand block only after a 75% fill rate has been attained in the prior block. Where companies possess significant available numbers in a given rate center, these two efficiency measures could prevent the opening of new blocks or prefixes.

Companies reported utilization data as of April 30, 2000. The sequential numbering and fill rates decision was issued in July 2000. Therefore, TD does not expect carriers to continue contaminating blocks unnecessarily.

Recommendation for Block Contamination Issues Affecting All Companies

? *The CPUC should monitor compliance with its fill rate and sequential numbering policies through future number utilization filings and audits.*

? *The CPUC should establish penalties for non-compliance with fill rate and sequential numbering policies adopted in Decision 00-07-052.*[30]

[30] See Chapter 1 for the discussion on Decision 00-07-052.

4. Reclamation of Prefixes

Decision 00-07-052 directed companies to return prefixes that are held unused for more than six months.[31] As shown in Tables 2-4 and 2-5, wireline carriers and wireless carriers hold 1,087,000 unused numbers and 214,000 unused numbers, respectively, in the 0% contaminated blocks. Of these 0% contaminated blocks, 370,000 numbers are in 37 whole prefixes, i.e. spare prefixes, while 931,000 numbers scattered throughout many different prefixes. The following table shows the breakdown between wireless and wireline carriers.

Table 2-6
Breakdown of Numbers in 0% Contaminated Blocks

	Avail. Nos. in 0% Contain Blocks	Avail. Nos. in Spare Prefixes	Avail. Nos. in Differing Prefixes
Wireline Carriers	1,087,000	300,000	787,000
Wireless Carriers	214,000	70,000	144,000
		370,000	

As shown above, 370,000 numbers in 37 prefixes can possibly be reclaimed if not used within six months. However, as a result of the FCC's March 31, 2000 NRO order, the NANPA no longer has sole authority to reclaim unused prefixes. The FCC granted authority to state regulatory commissions to investigate and determine whether code holders have activated prefixes within the allowed time frames, and directed the NANPA to abide by the state commission's determination to reclaim a prefix if the state commission is satisfied that the code holder has not activated the prefix within the time specified in the NRO order.[32] Substantial cooperation between the CPUC and the NANPA will be required in order for the CPUC to exercise this new authority and

[31] Carriers must file monthly reports with TD identifying prefixes which have not been activated within the six month time frame and explain the circumstances causing the delay in activating the code. The Commission would then consider each carrier's circumstances and determine whether to direct NANPA to reclaim the codes.

[32] FCC 00-104, Paragraphs 237, 238, and 241

determine whether a prefix should be reclaimed. Furthermore, the NANPA must still perform the mechanical steps to reclaim prefixes once the CPUC directs the NANPA to reclaim a prefix.

Recommendation for Reclamation of Prefixes

? *An order should be issued requiring the NANPA to notify the CPUC when a prefix has not been placed in service during the legally required time period for every California area code. The order should specify the procedures that the CPUC will follow in directing the NANPA to reclaim unused prefixes, and should require the NANPA to notify the CPUC of the steps the NANPA has taken to reclaim a prefix.*

D. Analysis of 3.8 Million "Unavailable" Numbers

In the following sections, the TD recommends a series of policies designed to require companies to use unavailable numbers more efficiently. These policies would potentially free more numbers for use in the pool, to be allocated through the monthly lottery, or to be otherwise used by companies.

Companies report that 3.8 million numbers in the 415 area code are either assigned to customers or are used by companies for reserved, administrative, intermediate and aging purposes. Assigned numbers are those numbers that are currently being used by customers or equipment. Companies commonly refer to these numbers as "unavailable". Unavailable numbers include not only those actually in use by customers, but also the following categories:

? *Reserved numbers – Numbers that are reserved in blocks for future use by specific customers;*

? *Administrative numbers – Numbers that companies use for their own internal use;*

? *Intermediate numbers - Numbers that are made available for use by another telecommunications carrier or non-carrier entity for the purpose of providing telecommunications service to an end user or customer; and*

? *Aging – Numbers from recently disconnected service which are not reassigned during a fixed interval.*

1. 3.0 Million Assigned Numbers

In the 415 area code, 3.0 million assigned numbers exist with 2.3 million assigned to wireline carriers and 0.7 million assigned to wireless carriers. The percentage of assigned numbers to total numbers held by companies is shown in the table below.

Table 2-7
Assigned Numbers to Numbers Held by Companies (in millions)

	Assigned Numbers	Nos. Held by Companies	Percentage
Wireline Carriers	2.3	5.0	45.8%
Wireless Carriers	.7	1.6	46.7%

a. Non –Working Wireless

Non-working wireless describes numbers assigned to wireless customer equipment, but which are not yet working. These numbers are considered as a sub-category of assigned numbers. For example, wireless carriers sometimes pre-package a cellular telephone with an assigned telephone number for sale to customers. Although the number is assigned, it will remain inactive until a customer purchases the telephone. Only one company reported 7,000 assigned numbers in the non-working wireless category for the 415 area code. While the quantity of non-working wireless numbers reported generally is low, this sub-category of assigned numbers could increase because there are no restrictions on the number of days that a wireless company can hold these numbers, causing many numbers to remain idle for an unspecified period of time. The CPUC should consider several options to improve inventory management of non-working wireless numbers. One option is for the CPUC to require companies to return these numbers to the unassigned category after 45 days (similar to the requirement the CPUC has established for reserved numbers). Therefore, additional numbers would be freed for

re-assignment. Since pre-packaged equipment with non-working assigned numbers is often located in various retail outlets, another option is for the CPUC to require companies to maintain inventory records of all such retail/wholesale equipment with the associated numbers assigned and to require regular (weekly/monthly) updating of these inventory records. In addition, the CPUC should continue to monitor non-working wireless numbers in the near term to track compliance with staff's recommendations.

Recommendations For Treatment of Non-Working Wireless

- ? *Non-Working wireless numbers should be treated as reserved numbers and limited to 45 days, after which they should be treated as available for assignment to customers.*
- ? *Companies should be required to maintain and update regularly the inventory records of all equipment assigned non-working wireless numbers along with the number assigned and submit such records to the CPUC upon request.*
- ? *The CPUC should continue to monitor non-working wireless numbers in the near term by reviewing future utilization filings and include this category of numbers in any audits conducted of wireless carrier number use.*

b. Eliminating Interim Number Portability Releases Numbers for Reallocation

Interim Number Portability (INP) is the ability to move telephone service from one service provider to another using Remote Call Forwarding (RCF), Direct Inward Dialing (DID), or equivalent means. [33] Prior to the implementation of permanent LNP, companies entered into INP arrangements to enable the transfer of customers from one company to another. Under these INP arrangements, two telephone numbers are

[33] Remote Call Forwarding allows a customer to have a local telephone number in a distant location. RFC is similar to call forwarding on a residential line, except that the RCF customer has no phone, no office and no physical presence in that location. Direct Inward Dialing uses a trunk from the central office which passes the last two to four digits of the Listed Directory Number into the PBX, thus allowing the PBX to switch the call to the correct extension without the use of an attendant. Existing DID retail service is limited to PBX services. For purposes of providing INP, DID switch functionality is used to provide INP to any CLC customer regardless of the type of terminal equipment used on the customer's premises.

associated with each customer. LNP eliminates the need for two telephone numbers for each customer when the customers change companies because customers can take their numbers with them.

Since the 415 area code is included in one of the top 100 MSAs in the nation, all wireline carriers should have became LNP-capable by the end of December 1998.[34] The only companies who reported INP numbers were ILECs. They reported a total of 271 INP numbers in the 415 area code. Since all the reported INP numbers were from ILEC's and none were from their competitors, it does not appear that INP exists in the 415 area code to facilitate competition for customers. Thus, TD questions why any INP numbers exist in this area code. Switching to LNP technology and eliminating INP will free up half of the 271 numbers that are currently dedicated to INP.

Recommendation for INP-Related Conservation Measures

? *The CPUC should require companies to transition from INP to LNP in the 415 area code and implement a monitoring mechanism to ensure compliance.*

? *The CPUC should adopt a schedule for transitioning INP arrangements to LNP in all other California area codes.*

c. Expanded Use of the 555 Prefix Could Release Other Prefixes Dedicated to Special Uses

Historically, the telecommunications industry has designated certain prefixes for special uses, usually to an incumbent local exchange carrier (ILEC). These include numbers for recorded public information announcements such as time-of-day and weather forecasts, high-volume call-in numbers, and emergency access[35] numbers. These prefixes are not made available for general commercial use and as such, numbers that are in actual use lie vacant. In 1999, companies decided not to duplicate the special use

[34] However, two wireline carriers still remain non-LNP capable.

[35] The emergency access prefixes are for services other than 911.

codes in each area code. Concerned that this process could adversely affect the public, the CPUC directed that prefixes should be duplicated in each new area code.

The utilization study shows that six prefixes are dedicated for special uses, one each for high volume calling, directory assistance, 700 IntraLata Presubscription, time, emergency preparedness and weather service. Except for high volume calling, companies reported 50,000 assigned numbers in five prefixes. TD questions the necessity of assigning an entire prefix for each purpose.

Furthermore, having multiple special use codes is an inefficient use of numbers in the 415 area code as well as in other area codes in California. For example, if the 555 prefix currently reserved only for directory assistance[36] could be used to provide time, weather, emergency service and 700 IntraLata Presubscription, then four more prefixes could be returned for reallocation in the 415 area code.

Similarly, expanded use of the 555 prefix throughout the state could result in more returned prefixes in other area codes. TD recommends that the CPUC initiate an investigation into broader use of the 555 prefix in California. The CPUC should further analyze the option of obtaining standard 555 numbers in every California area code to provide time, emergency preparedness, and weather information at no additional cost to customers.

With respect to high volume calling, the utilization study indicates that the prefix dedicated to this service is not fully utilized[37]. Out of the 10,000 numbers allocated for High Volume Calling, only 90 are actually in use. The remainder of these numbers, however, can be a potential source of numbers for pooling. TD recognizes that there may be technical issues involved in obtaining these numbers. TD recommends that the CPUC solicit comments in the Local Competition proceeding regarding technical issues that

[36] The number used for inter-area code directory assistance which is uniform throughout California is 1(XXX) 555-1212. This number has been designated for use at the federal level.

[37] High volume calling codes are meant to provide service to customers with a large quantity of incoming calls such as radio stations.

would prevent the high volume prefix from being reclaimed and placed in the 415 number pool.

In addition to the under-utilization of these numbers, the distribution of these numbers among various blocks also demonstrates inefficient utilization practices. The 90 numbers are contained within six different 1,000 number blocks. Consistent with our statewide conservation measures, adopted in July, TD recommends that CPUC require companies to assign these numbers sequentially within each 1,000 block.

<u>Recommendations for Special-Use Prefixes</u>

- ? *TD recommends that the CPUC initiate an investigation into the possibility of moving the number for time, emergency preparedness, weather service and 700 IntraLata Presubscription into the 555 prefix.*
- ? *TD recommends that the CPUC include in its investigation the broader use of the 555 prefix in California's area codes by providing standard 555 numbers in every California area code to provide time, emergency preparedness, and weather information.*
- ? *TD recommends that the CPUC solicit comments in the Local Competition proceeding (R.95-04-043/I.95-04-044) regarding technical issues that would arise if 1,000 number blocks from the high-volume calling prefix are reclaimed and placed in the 415 number pool.*
- ? *TD recommends that CPUC require companies to assign numbers sequentially in special use prefixes. Where the numbers are presently assigned randomly, TD recommends that these numbers be moved and consolidated in one 1,000 block in order to free more blocks for number pooling*

2. Reserved Numbers Are a Potential Source of Additional Numbers

Companies "set aside" numbers for future use by customers.[38] Previously, industry number assignment guidelines allowed companies to reserve a prefix for up to

[38] An example would be a customer request for 2,500 numbers to be used in 2000, coupled with a request to have the next 2,500 numbers in sequence "reserved" for the customer to use in 2001.

18 months for customer future use.[39] The FCC's NRO Order modified the number reservation period to 45 days. This 415 utilization study incorporated the FCC's 45-day requirement. The FCC later issued an extension until December 1, 2000 for companies to comply with the 45-day rule [40]. The extension allows companies time to upgrade their number tracking mechanisms, which tally the quantities of reserved numbers they hold. While companies reported a total of approximately 316,000 reserved numbers in the 415 utilization study[41], it is unclear whether the reported amount is accurate. Since companies could reserve numbers for longer than 45 days prior to the NRO Order, the quantity of reserved numbers reported may be overstated and, correspondingly, the quantity of available numbers reported may be understated.

Wireline carriers reported approximately 305,000 reserved numbers. If the quantity of reserved numbers held by wireline carriers can be minimized, additional numbers could be available for reallocation in the 415 number pool[42] and for immediate use by the companies from within their own number inventories. Currently there are no limitations on the quantity or percentage of numbers a company can classify as reserved before requesting new number resources. Similarly, companies are not required to use their reserved numbers stock before they can request that new numbers be allocated to them. The situation in the San Francisco-Central rate center illustrates this problem. In that rate center, wireline carriers predict that they will need 357,000 telephone numbers allocated to them from the 415 pool over the next 18 months [43]. At the same time, wireline carriers reported in the study that they hold 190,038 reserved telephone numbers in that same rate center. In another example, one company reported that it held nearly

[39] Central Office Code (NXX) Assignment Guidelines, prepared by the Industry Numbering Committee, January 27, 1999 version, Section 4.4.

[40] FCC Order 00-280, CC Docket No. 99-200, adopted and released on July 31, 2000.

[41] See Appendix D for a breakdown of reserved numbers reported in the 415 NPA by rate center.

[42] Most wireline carriers are LNP-capable and, thus, request new numbers at the 1,000 block level from the 415 pool. A small subset of wireline carriers are not LNP-capable and still request new number resources at the 10,000 block level (i.e. whole prefix) from the NANPA. See Chapter 3 of this report for analysis pertaining to wireline carriers that are not LNP-capable.

[43] Source: The 415 Pooling Administrator's Combined Forecast is available at www.numberpool.com

9,300 reserved telephone numbers and only assigned 40 numbers to customers in one prefix in the San Francisco Juniper rate center; but it forecasted that it needed 9,000 numbers in that rate center from the 415 pool over the next 18 months. If the CPUC orders efficient use practices specific to reserved numbers, carriers will more efficiently use number resources.

Wireless carriers reported 11,000 reserved numbers in the 415 area code. While these companies cannot currently participate in number pooling, the CPUC should also adopt efficient number use practices specific to the reserved numbers these companies hold. Such practices could immediately free up numbers within these companies' inventories for use and, thus, could slow the rate at which new prefixes are allocated to these companies. Once wireless carriers are able to participate in number pooling, these practices could have the same efficiency gains as those for wireline companies.

Recommendations for Reserved Numbers

- ? *The CPUC should monitor reserved number use for all companies by reviewing future utilization data to ensure companies are complying with the FCC's 45-day requirement.*
- ? *The CPUC should adopt efficient number use practices specific to company's reserve number holdings. In developing these practices, the CPUC should investigate various alternatives including, but not limited to, 1) limits on the quantity or percentage of reserved numbers companies can hold, and 2) requirements for using reserved number resources prior to requesting new number resources.*

3. Restrictions on Administrative Numbers Could Yield More Numbers

Administrative numbers are those not assigned to customers and are generally used for a wide range of applications for companies' internal use, including testing, internal business, and other network purposes. Companies self-reported slightly more than 44,000 administrative numbers in the 415 area code. Wireline carriers hold

approximately 30,000 of these numbers and wireless carriers hold approximately 14,000 of these numbers.

The utilization study revealed that there is a potential for companies to over-assign administrative numbers within a particular 1,000 block, prefix or rate center in the 415 area code. For example in the Belvedere rate center, a large wireline carrier reported 51 administrative numbers while a smaller wireline carrier reported 600 administrative numbers. Moreover, the large wireline carrier reported serving nearly 13,000 customers in that rate center and the smaller wireline carrier reported serving 100 customers. Although one might assume that a greater need for administrative numbers exists for companies serving more customers in a given rate center, this example illustrates that companies are not necessarily using the number of customers as a criteria for determining how many administrative numbers are needed. Also, the high level of administrative numbers prevents the smaller company in the example from donating certain blocks to the 415 number pool when the blocks are not otherwise used to serve customers[44]. Given the variances in the levels of administrative numbers between companies, it is unclear what basis companies use for placing numbers in this category. The CPUC should therefore pursue an investigation in this area.

In addition, some companies randomly assign administrative numbers and are thereby wasting number resources. Companies could conserve numbers by changing the way in which these types of numbers are assigned. First, some companies randomly assigned administrative numbers in multiple thousand blocks within the same prefix when they have available number resources to centralize those assignments within one or a few thousand blocks. This means that wireline carriers contaminated multiple thousand blocks and prevented them from being candidates for reallocation to other companies in the 415 number pool or other LNP-based conservation measures. For wireless carriers,

[44] It is noteworthy that the smaller company also had 2,000 reserved numbers in the prefix in the above example, further illustrating the imbalance between numbers companies are assigning to customers and numbers they are using for other purposes. Again, this prevents blocks that could otherwise be candidates for pooling from being considered for reallocation to other carriers. This chapter also contains a fuller discussion of reserved numbers.

this practice means that they will already have contaminated multiple thousand blocks and prevent them from being donated once they can participate in number pooling, or from being used in other LNP-based conservation measures.

Second, some companies holding multiple prefixes in a given rate center randomly assign administrative numbers throughout different prefixes when they have the available number resources to centralize the assignment of these numbers in one prefix in that rate center. TD questions the need for companies to hold multiple prefixes in a given rate center, when they are using multiple prefixes to serve their internal purposes and not necessarily to serve customer needs. Moreover, since these companies contaminated many more thousand blocks in multiple prefixes versus in one prefix, this practice exacerbates the problem of contaminating number resources and preventing them from being donated to the pool, as described above.

Recommendations for Administrative Numbers

- ? *The CPUC should develop criteria by which companies assign administrative numbers. The CPUC should consider placing a limit on the quantity or percentage of administrative numbers companies are allowed to hold.*
- ? *The CPUC should develop rules that require companies to limit administrative number assignments within certain blocks in a given prefix. In cases in which companies hold multiple prefixes in a single rate center, the CPUC should develop rules that require companies to limit administrative number assignments within prefixes.*

4. Intermediate Numbers

The "intermediate number" category is a new one only recently introduced by the FCC in its NRO Order. This category tracks numbers that companies make available for use by another telecommunications carrier or non-carrier entities. Companies reported approximately 206,000 intermediate numbers in use in the 415 area code. Wireline carriers hold close to 121,000 of those numbers and wireless carriers hold just over 85,000. The quantity of intermediate numbers varied significantly among rate centers in

the 415 area code[45]. Since the intermediate number category is new, the quantity of numbers reported by companies may increase over time as more companies become familiar with this category. TD notes that this number use category has the potential for abuse by companies if they use significant quantities of number resources for intermediate purposes and take away available resources that could be assigned to customer uses. Therefore, TD recommends the CPUC continue to monitor intermediate number use in the future.

Recommendations for Intermediate Numbers

? *The CPUC should monitor intermediate number use for all companies by reviewing future utilization filings to test whether potential abuses in this reporting category occur.*

a. Type 1 Numbers

Wireline carriers allocate numbers for use by wireless carriers through Type 1 interconnection agreements.[46] Because wireline and wireless carriers share responsibility for Type 1 numbers, both types of carriers reported on these numbers. Wireline carriers report Type 1 numbers in the Intermediate category since they provide these numbers to another company. Wireless carriers report on the same numbers in greater detail since they actually use these numbers, placing them in the Assigned, Administrative, Reserved, Intermediate, Aging, or Available categories.

Reporting of Type 1 numbers is complicated as wireline and wireless reports often do not match. In the 415 area code, nearly one-third of all Type 1 numbers are unaccounted for or mismatched.[47] Wireline donor carriers do not monitor wireless Type 1 inventories, nor do they proactively reclaim unused Type 1 numbers from wireless

[45] See Appendix F for a breakdown of intermediate numbers held by wireline and wireless carriers. Appendix F demonstrates that in certain rate centers, carriers reported no intermediate numbers.

[46] Type 1 numbers are *programmed* in the wireline carrier's end office, but are *used* by a wireless carrier.

[47] 36,440 out of a total of 116,100 Type 1 numbers are unaccounted for or mismatched.

carriers. TD recommends that wireline carriers perform an annual inventory check on Type 1 numbers and reclaim any unused Type 1 numbers within 60 days.[48]

As described in Chapter 1, state and federal mandates require most companies to demonstrate efficient numbering practices before becoming eligible to obtain more numbers. In contrast, Type 1 wireless carriers have no check on their number use because they draw numbers directly from wireline companies, therefore avoiding the scrutiny of the official number and pooling administrators. TD recommends that Type 1 wireless carriers be subject to number conservation measures and a system to ensure compliance.

Improved Type 1 number management is particularly crucial because unlike numbers held by most wireless carriers, Type 1 numbers are eligible for number pooling.[49] Therefore, Type 1 numbers are not only available to be recovered, but these numbers will also contribute to the success of pooling. Despite the problems with reporting, TD has identified three blocks of numbers in the 415 area code that may be eligible for donation to the pool.[50] The CPUC should recognize Type 1 numbers as a resource for number pooling and take steps to have wireless carriers donate excess blocks to the pool.

Recommendations for Type 1 numbers:

? *Wireline and wireless carriers should improve Type 1 number inventory management. Wireline carriers should perform an annual inventory check of wireless Type 1 numbers to confirm that wireless companies are using the numbers allocated to them. Companies should make inventory data available to the CPUC upon request. Wireline companies should reclaim unused numbers within 60 days.*

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[48] Type 1 numbers may go unused because wireless carriers go out of business, or because of inadequate record keeping.

[49] The 415 study revealed that Type 1 numbers given to wireless carriers are from prefixes in which LNP has already been initiated by the wireline carriers. Because Type 1 numbers reside in the wireline carrier's end office, Type 1 numbers are LNP-capable and thus suited for pooling.

[50] These blocks are 10% or less contaminated.

? *Type 1 carriers should be subject to number conservation techniques such as sequential numbering and fill rates. A system to ensure compliance with Type 1 number conservation measures should be developed.*

? *The CPUC should consider numbers held by Type 1 wireless carriers as candidates for number pooling. Excess and unused Type 1 numbers should be donated to the number pool.*

5. Aging Numbers

The FCC's NRO Order, adopted March 17, 2000, defines *aging numbers* as disconnected numbers that are not available for assignment to another end user or customer for a specified period of time. Consistent with the INC Guidelines, the CPUC adopted the FCC upper-limits for aging numbers as 90 days for residential numbers and 365 days[51] for business numbers.

In the 415 area code, there are approximately 190,000 numbers in aging, representing 5% of the total unavailable numbers. While most service providers track aging telephone numbers by business and residential categories, Pacific Bell, the largest single holder of telephone numbers in the 415 area code, does not differentiate between business and residential customers when tracking aging numbers. Since Pacific Bell did not differentiate, the consultant chose to place those in the business category. Therefore, the vast majority of aging numbers is categorized in the business category and may give a false impression that most of the aging numbers are business numbers.

Because Pacific Bell does not differentiate between residential and business in reporting aging numbers, it is uncertain whether the maximum 90-day aging period for residential numbers is governing their aging policy, and whether at the end of the 90-day period, Pacific Bell is properly reassigning these numbers to the available category.

[51] In the NRO Order, both 360 days and 365 days were used as the time period for aging business numbers. In a clarifying order, the FCC adopted 365 days as the aging period for business numbers. When the CPUC sent out the parameters for utilization data for this study, the 360 day time period for aging business numbers was used. In order to be consistent with the time frames the FCC adopted, the CPUC is now using the 365 time period for aging business numbers.

Pacific Bell may be allowing residential numbers to be in the aging category for nine months longer than is permissible under both FCC and CPUC rules.

A higher percentage of aging numbers occurs in the wireless category, as compared to the wireline category. Aging numbers represent 8.1 percent of the total unavailable wireless numbers, or about 74,000 numbers. Aging numbers represent 4.0 percent of the total unavailable wireline numbers, about 116,000 numbers. This number is consistent with the higher turnover or "churn" that occurs in the wireless industry. Table G-1, in Appendix G, shows the breakdown of aging numbers by wireless and wireline categories.

<u>Recommendation for Aging Numbers</u>

? *Although the CPUC has required all companies to differentiate between residential and business numbers in aging and track the two categories separately, Pacific Bell has failed to comply with these requirements. Pacific Bell should be redirected to differentiate between business and residential numbers in aging, track them separately, and report on each category accurately. The CPUC should assess penalties for failure to comply.*

6. The Need to Audit the Data

The data analyzed in this 415 utilization study was self-reported by companies. Given the area code crisis in California, the CPUC should audit this data for two reasons. First, verifying number usage data is important to ensure that the public resource of telephone numbers within area codes is efficiently managed. Second, audits will help verify whether companies are complying with CPUC and FCC rules for number usage.

<u>Recommendations for Audits</u>

? *The CPUC should audit the data submitted by companies in this study and future area code utilization studies.*

CHAPTER THREE: NUMBER POOLING AND OTHER NUMBER CONSERVATION MEASURES

A. Introduction

Many of the recommendations in Chapter Two resulted directly from the analysis of the utilization data and address actions that the CPUC should undertake to make additional numbers available for either pooling or for the regular monthly lottery. The recommendations contained in this chapter suggest additional conservation measures as required by Public Utilities Code Section 7935(a). The CPUC could adopt the following conservation measures in the 415 area code and statewide: LNP- related actions, Unassigned Number Porting, Rate Center Consolidation, and prefix sharing. In addition, California should build upon the success of number pooling in 415 by setting up trials in other area codes. When applied, these conservation measures would result in uniform policies which will cause companies to use numbers more efficiently across California and would minimize customer confusion.

B. Number Pooling

Number pooling is an excellent method of number conservation. The CPUC worked aggressively to bring number pooling to California and the results have been dramatic. Pools are underway in the 310 and 415 area codes and the CPUC plans to roll out the maximum possible number of pools before national number pooling begins. In the 310 area code, number pooling has been in effect for over six months. The pool has satisfied the numbering needs of all companies participating in the pool without opening a single prefix.[52] Prior to pooling, 98 prefixes would have been opened to satisfy the demand for numbers. Number pooling has avoided the need to open prefixes and extended the life of the 310 area code by at least 15 months.[53]

[52] Two prefixes have been opened in the 310 pool for LRN assignment purposes.

[53] As of September 18, 2000.

The positive experience in 310 is mirrored in 415. The 415 pool opened July 29, 2000. Again, without opening a single prefix, the numbering needs of companies have been met.[54] After just two months, pooling has saved 12 prefixes.

Pooling benefits not only the public but the companies as well by reducing the time necessary to acquire numbering resources. Without pooling, activating new numbers takes at least 66 days.[55] With number pooling, companies can activate new numbers in three weeks.

1. More Accurate Forecasting Will Improve Number Pooling

In California, number pooling has worked well because companies have met their numbering needs from blocks numbers other companies donate to the pool. The CPUC has set aside prefixes in each area code that will be used to replenish the pools if and when donations are no longer sufficient. There are a limited number of set aside prefixes, so it is crucial that these prefixes be opened only when there is truly a need.

If donated numbers are not sufficient to meet the companies' forecasts, a new prefix may need to be opened. Industry guidelines suggest replenishing a pool at least 66 days in advance when the forecast shows a company will need more numbers than the pool has on hand. This presents a problem, as companies in California have, on average, forecast *seven times* more numbers than they will take from the pool. In many cases the forecasts are incredibly exaggerated. For example, in the San Francisco Central Rate Center in the 415 area code, companies predicted they would use 75 blocks in the first two months of the pool. However, they have used none. Had the pool administrator opened prefixes based on the forecast, the prefixes would lie unused in the rate center.[56]

The CPUC has thus far prevented prefixes from being unnecessarily opened by ordering the Pooling Administrator (PA) to consult with TD staff prior to opening any

[54] Three prefixes have been opened in the 415 pool for LRN Assignment purposes

[55] Before a whole prefix is activated, the prefix must be first listed for 66 days in the Local Exchange Renting Guide (LERG). Stating what rate center the prefix will be located in.

[56] Data can be found in Pooling Appendix.

new prefix. However, the CPUC believes this issue should be addressed for the long term. Industry guidelines encourage companies to over-forecast, because a company can only be assured numbers for which it forecasts.[57] In essence, a company could be penalized for under-forecasting. Since there is no penalty for over-forecasting, it is in companies' interests to err on the side of over-forecasting. TD recommends the CPUC develop specific rules guiding company forecasting. TD also recommends that the PA take historical usage into account when determining when to open a fresh prefix of 10,000 numbers.

Recommendations for Number Pooling

- ? *The CPUC should continue to urge the FCC to adopt a 75% fill rate requirement for pooling nationwide.*
- ? *The CPUC should work with industry groups and the Pooling Administrator to develop specific rules for companies pertaining to forecasting a six-month inventory when a number pool is authorized in a particular area code.*

2. TD Finds 75 Additional Blocks for Number Pooling

Companies were required to file Donation Identification Reports with the PA on May 2, 2000 for the 415 number pooling trial. On the same date, the CPUC requested reports from the companies regarding block donations and blocks held for six-month inventory. The pool started on July 29, 2000 with 565 donated blocks. Because the CPUC did not receive reports on block donations and blocks held for six-month inventory from four companies in the 415 area code, TD subsequently contacted these companies. As a result of these contacts, three companies donated an additional 75 blocks to the 415 pool. Optel California Telecom has yet to file with the CPUC the block donations and blocks held for six-month inventory. TD has confirmed with the PA that the additional 75 blocks from the three companies have been donated and confirmed that the PA has not yet received any reports from Optel California Telecom.

[57] Sections 6.1.4 & 6.1.5 in INC 99-0127-023, January 10, 2000

The latest update on the numberpool.com website shows 18 blocks assigned from the pool as the pool started on July 29, 2000. A total of 622 blocks are available for assignment as of August 18, 2000. Adding the set aside 360 blocks, a maximum of one million numbers is available for pooling. Further donations can still come into the pool.

Recommendation for non-compliant companies

? *The CPUC should re-direct Optel California to file, within one month, the block donation and six-month inventory reports with the CPUC. If Optel fails to submit these reports, the CPUC should establish penalties against Optel.*

C. Lack of Local Number Portability Stands as a Key Barrier to Pooling

Full LNP deployment in the 415 area code is critical to effective number conservation. As described in Chapter One, LNP enables customers to keep their telephone numbers when they switch companies. Because the number remains with the customer and can be transferred to different companies, there is no need to distribute duplicate numbering resources to both companies. Also, LNP is the technology platform that makes number pooling possible.

In an order released in 1997, the FCC ordered all wireline carriers in the top 100 MSAs to become LNP capable by December 1998.[58] The 415 area code falls within one of the top 100 MSAs. The study revealed that all but two wireline carriers in the 415 area code are LNP capable. These companies hold 48,000 numbers that could be made available for number pooling, if they implemented LNP technology. This non-compliance could likely be explained by the existence of subsequent FCC documents contradicting the original LNP order. The CPUC is working with the FCC to resolve the confusing language in the texts. Once this is accomplished, the CPUC recommends requiring all wireline carriers to become LNP capable within 6 months.

[58] FCC 96-286 in CC Docket No. 95-116.

Wireless carriers, however, requested and received from the FCC an extension of time, until November 2002, to become LNP capable.[59] The FCC has yet to decide when wireless carriers, once LNP capable, will be required to participate in number pooling. The CPUC has filed comments with the FCC arguing that wireless carriers should be required to participate in pooling immediately upon becoming LNP capable.[60] Wireless non-LNP capable carriers hold 157 prefixes in the 415 area code, of which 315 blocks could be made available for pooling if they were required to participate in the pool.

As noted earlier, federal LNP requirements are directed at companies in the country's top 100 MSAs. But roughly half of the area codes in California fall partially or completely outside of these MSAs. These area codes are facing similar numbering crises, and LNP is not ordered. Without full activation of LNP throughout California, the CPUC is effectively prevented from operating number pools in half of the area codes in the state. California has a pending petition at the FCC to extend LNP deployment statewide. The CPUC should urge the FCC to act on the petition for authority to order LNP capability statewide.

Recommendations for LNP

- *The CPUC should encourage the FCC to resolve the contradiction in the texts ordering LNP capability for all wireline carriers in the top 100 MSAs.*
- *As soon as permitted by the FCC, the CPUC should request that non-LNP capable wireline carriers in the 415 area code become LNP capable within the time frame prescribed by the FCC, which in no case may exceed 6 months from the day the CPUC makes the request.*
- *In the meantime, companies, both inside and outside of the top 100 MSAs, should be encouraged to make requests of one another to become LNP capable.*

[59] FCC 99-19, WT Docket 98-229; CC Docket No. 95-116, Released: February 9, 1999. Paging companies are indefinitely exempt from becoming LNP-capable.

[60] Further Comments of the California Public Utilities Commission and the People of the State of California in CC Docket No. 99-200, submitted May 19, 2000.

D. Unassigned Number Porting

Unassigned Number Porting (UNP) is the term used to describe the transfer of unused numbers from one company to another. Like number pooling and the porting of assigned numbers from company to company, UNP is made possible by deployment of Local Number Portability, or LNP. The primary benefit of UNP would be increased access to unused numbers stranded in carrier inventories. UNP would also strengthen competitively neutral access to public numbering resources by enabling carriers with smaller inventories to access the inventories of carriers with larger number holdings. . UNP would allow companies to transfer small increments of numbers between themselves. Various proposals have suggested limiting the increments to 25 or 100 numbers.[61] Two efficiencies would be gained: 1) companies with smaller scale needs would be able to receive numbers in increments appropriate to meet their needs, and 2) unused numbers stranded in carrier inventories would be transferred to companies where they could be put to use.

Currently, companies receive unused numbers from the NANPA or the PA in increments of 10,000 numbers (prefixes) or 1,000 numbers (blocks). In areas without number pooling, prefixes held in company inventories that are not put to use within six months must be returned, but only if uncontaminated. If just one number has been used, the remaining 9,999 are stranded in the company inventory. In areas with number pooling, blocks are eligible for return only if 10% or less contaminated. For example, if a company receives 1000 numbers and only has need for 100 numbers, the remaining 900 numbers are eligible for return. However, if a company received 1000 numbers and only has need for 101 numbers, the remaining 899 numbers are ineligible for return and are stranded in the company inventory. UNP is one way to address the problem of stranded numbers.

[61] See INC Contribution #336R of September 29, 2000, "UNP Architecture With Minimal Administrative Structure" and Focal and MCIWorldcom's Report on UNP Trial

The FCC has contemplated UNP but has so far declined to act.[62] The FCC has not ruled out UNP as a conservation measure.[63] In the absence of a voluntary carrier agreement to implement UNP, however, the CPUC could only implement UNP with FCC approval. Given the number conservation benefits to be had, the CPUC should petition the FCC for authority to undertake a UNP trial.

Recommendations for UNP

- ? *The CPUC should petition the FCC for authority to implement UNP statewide.*
- ? *The CPUC should solicit comments in order to develop rules and practices necessary to implement UNP.*

E. Consolidation of Rate Centers to Maximize Number Use

Rate Center Consolidation (RCC) is a potential number conservation tool because it allows companies to use numbers over a larger geographic area, thus slowing the rate at which prefixes are used. Rate center location dictates both the scope of a customer's local calling area and the charges assessed per toll call. In California, each rate center governs a relatively small, uniform local calling area, measured from the rate center of each exchange. Because the local calling areas in California are small compared to those in many other states, it is virtually impossible to migrate to larger calling areas via consolidation of rate centers without eliminating at least some toll call routes.

Eliminating toll routes would have the residual effect of reducing revenues for toll service providers, which include both local exchange carriers and interexchange carriers. The two major ILECs in California, Pacific Bell and Verizon (formerly GTE California), have expressed at industry meetings their belief that they should be "made whole" for any loss of toll revenues that likely would result from consolidating rate centers. An industry

[62] NRO Order, FCC 00-104, CC Docket 99-200, ¶ 230. "We reiterate our finding that UNP and ITN [individual telephone number pooling] are not yet sufficiently developed for adoption as nationwide numbering resource optimization measures and conclude that ITN and UNP should not be mandated at this time.".

[63] See ¶ 231: "We permit carriers, however, to engage voluntarily in UNP where it is mutually agreeable and where no public safety or network reliability concerns have been identified."

task force which the CPUC charged with developing a proposal for rate center consolidation reported to the CPUC in March 1999 that it would offer no such plan until the CPUC addresses revenue and consumer impact issues. However, it is difficult if not impossible, for the CPUC to address consumer and revenue impacts if the CPUC has no plan before it for consolidating rate centers, which would provide the context and details for assessing such impacts.

California has roughly 750 rate centers, each of which is the approximate center of a 12-mile local calling area. With no input from the industry, the CPUC cannot begin to guess what approach would be most appropriate. For example, California could consolidate from 750 rate centers to 400, or to 200. Each of those possibilities would present different rate "impacts" for both companies and customers. Alternatively, rather than attempting to consolidate rate centers on a statewide basis, the CPUC could consider consolidating rate centers on an area code-by-area code basis. All rate centers in one area code, for example, could be consolidated into one rate center. This would eliminate both the uniform statewide local calling area of 12 miles and uniform statewide rates for each company, thus generating some amount of customer confusion as individuals travel throughout the state for business or social purposes, or relocate their home or business. Further, because companies would lose toll revenues when rate centers are consolidated and local calling areas expanded, the CPUC would need to address the question of which, if any, companies should be allowed to recover those lost revenues, and if so, how. [64] Finally, rate center consolidation will mean direct, substantial, and permanent basic rate increases for many customers, unless the ILECs forgo their claim that RCC should be revenue neutral. Economics and Technology, a Boston consulting group, has projected

[64] For example, while the ILECs still control roughly 95% of the residential toll market, competitors have succeeded in making significant inroads into the business toll market, where the ILECs now hold only 50% of the market. If the CPUC were to decide that the ILECs should be "made whole" for any lost toll revenues, then other companies legitimately could demand a mechanism to make them whole as well. Alternatively, if the competitors cannot practically be reimbursed for lost revenues, then as a policy matter, the CPUC must decide if it is reasonable to allow only the ILECs to recover such revenue.

that …"rate center consolidation in California could result in a per-access-line increase of $5.56 in basic monthly rates for California ILEC customers."[65]

This may not be an acceptable option, even though California presently has among the lowest local exchange rates in the country. And, if the ILECs continue to press for revenue neutrality, the very process of determining the amount of those revenues, as well as how those monies should be recovered and from what class(es) of customers, would constitute a rate-design proceeding of significant scale and scope. Such a proceeding could consume a tremendous amount of CPUC industry and consumer representative resources and take one to two years.[66]

Nonetheless, because RCC offers the potential for conserving significant quantities of numbers in California, TD recommends that the CPUC renew its efforts to determine how RCC could be implemented in California. The industry should be directed to posit several different scenarios, if they cannot agree on one proposal.

Recommendations for Rate Center Consolidation

? *The CPUC should undertake further investigation by ordering the telecommunications industry to develop a plan, within 180 days, for rate center consolidation.*

F. Sharing Prefixes May Yield More Efficient Number Use

In analyzing previous utilization data in the 310 area code, TD became aware that two non-affiliated companies were sharing prefixes under an informal arrangement. Using LNP technology, a company with excess numbers had transferred whole thousand blocks of numbers to the other company for use. TD believes his sharing arrangement promotes efficient number use among companies.

Some companies reporting utilization data in the 415 area code are affiliated through mergers, acquisitions or other business relationships. Despite these affiliations,

[65] "Where Have All the Numbers Gone?" (Second Edition), The Ad Hoc Telecommunications Users Committee, prepared by Economics and Technology, Inc., June 2000. The estimate of $5.56 may be conservative.

[66] The last major rate design proceeding undertaken for Pacific Bell and Verizon, then GTEC, was the Implementation and Rate Design (IRD) phase of the New Regulatory Framework proceeding, 1.87-l l-033. The IRD phase took three years to complete.

each company separately requests numbers from the NANPA and/or in the 415 number pool[67]. TD notes that the benefits of sharing prefixes may be different in area codes in which number pooling has already been implemented versus those that number pooling has not been implemented. Sharing prefixes between companies appears worthy of further investigation by the CPUC as a mechanism to promote more efficient use of numbers.

Recommendations for Sharing of Prefixes

? *The CPUC should further explore sharing of prefixes as a means to more efficiently utilize numbers in all area codes.*

[67] Prior to the opening of the 415 number pool on July 29, 2000, all companies requesting telephone numbers got prefixes from the NANPA. Currently, only non-LNP capable carriers receive prefixes from the NANPA, while LNP capable carriers receive thousand-number blocks from the pooling administrator.

CONCLUSION

Analyzing the utilization data provided by carriers has provided useful information regarding number availability and usage practices in the 415 area code. It also offers insights into developing better public policies to improve efficiency of number use.

We now know that of the approximately 7.7 million usable numbers in the 415 area code, roughly 3.9 million, or more than half, presently are not in use. Despite the increasing demand for numbers, the 415 area code is not fully utilized. The data indicates that there is considerable room for growth within the existing 415 area code, and it is premature to consider splitting or overlaying the 415 area code at this time.

The CPUC has already directed carriers to employ measures to use more efficiently the numbering resources in 415. Recently adopted fill rates and sequential numbering rules will insure that carriers better use their existing resources and receive additional numbers only on an as-needed basis. The Number Pooling Trial assures that all LNP capable carriers are given numbers expeditiously and in usable blocks. Allocating numbers in 1,000 block increments rather than in full prefixes of 10,000 numbers will insure that the numbering resources are used more efficiently and can greatly extend the life of the existing area code. Implementing these more efficient numbering practices is an important first step, but more needs to be done.

In analyzing the carrier data, it is now clear that because of 1) past inefficiencies in numbering policies and practices, 2) the 10% contamination ceiling for block donations to pooling, and 3) the deferreal of LNP Capability for wireless carriers 3 million numbers are not in use in 415 but cannot be reassigned to other carriers. Changing in contamination thresholds, implementing UNP, and requiring LNP capability for all carriers could make these stranded numbers available for reassignment.

The CPUC should continue its collaborative process with the FCC and the telecommunications industry to implement Unassigned Number Porting, the development of non-geographic-specific area codes, and other measures which will more fully utilize

numbers. The CPUC should begin implementation of the many number conservation and management practices found in the Recommendations Section of this report. As a public resource, it is important that our numbering supplies are used as efficiently and effectively as possible.

Appendix A

Part 1-Section A

_____ *NPA*

RATE CENTER _____

UTILIZATION STUDY FORMAT

INFORMATION								ASSIGNED	ADMINISTRATIVE				INTER-MEDIATE	RESERVED	AGING			UNAVAILABLE	AVAILABLE
OCN	COC Type	LNP	Special Use	Rate Center	NPA	NXX	X	TOTAL	Internal/Official	Test	Other	TOTAL	TOTAL	TOTAL	RES	BUS	TOTAL	TOTAL	TOTAL
							0	0	0	0	0	0	0	0	0	0	0	0	1000
							1	0	0	0	0	0	0	0	0	0	0	0	1000
							2	0	0	0	0	0	0	0	0	0	0	0	1000
							3	0	0	0	0	0	0	0	0	0	0	0	1000
							4	0	0	0	0	0	0	0	0	0	0	0	1000
							5	0	0	0	0	0	0	0	0	0	0	0	1000
							6	0	0	0	0	0	0	0	0	0	0	0	1000
							7	0	0	0	0	0	0	0	0	0	0	0	1000
							8	0	0	0	0	0	0	0	0	0	0	0	1000
							9	0	0	0	0	0	0	0	0	0	0	0	1000
							Total>>	0	0	0	0	0	0	0	0	0	0	0	10000
							0	0	0	0	0	0	0	0	0	0	0	0	1000
							1	0	0	0	0	0	0	0	0	0	0	0	1000
							2	0	0	0	0	0	0	0	0	0	0	0	1000
							3	0	0	0	0	0	0	0	0	0	0	0	1000
							4	0	0	0	0	0	0	0	0	0	0	0	1000
							5	0	0	0	0	0	0	0	0	0	0	0	1000
							6	0	0	0	0	0	0	0	0	0	0	0	1000
							7	0	0	0	0	0	0	0	0	0	0	0	1000
							8	0	0	0	0	0	0	0	0	0	0	0	1000
							9	0	0	0	0	0	0	0	0	0	0	0	1000
							Total>>	0	0	0	0	0	0	0	0	0	0	0	10000
							0	0	0	0	0	0	0	0	0	0	0	0	1000
							1	0	0	0	0	0	0	0	0	0	0	0	1000
							2	0	0	0	0	0	0	0	0	0	0	0	1000
							3	0	0	0	0	0	0	0	0	0	0	0	1000
							4	0	0	0	0	0	0	0	0	0	0	0	1000
							5	0	0	0	0	0	0	0	0	0	0	0	1000
							6	0	0	0	0	0	0	0	0	0	0	0	1000
							7	0	0	0	0	0	0	0	0	0	0	0	1000
							8	0	0	0	0	0	0	0	0	0	0	0	1000
							9	0	0	0	0	0	0	0	0	0	0	0	1000
							Total>>	0	0	0	0	0	0	0	0	0	0	0	10000

Appendix A

Part 1-Section A _____ *NPA* UTILIZATION STUDY FORMAT

CONTAMINATION LEVELS *RATE CENTER* _____

INFORMATION								CONTAMINATION LEVELS												
OCN	COC Type	LNP	Special Use	Rate Center	NPA	NXX	X	Contamination %	0%	Quantity	0%</= 10%	Quantity	10%</= 15%	Quantity	15% </= 20%	Quantity	20% </= 25%	Quantity	>25%	Quantity
0	0	0	0	0	0	0	0	0%	Yes	1	No	0	No	0	No	0	No	0	No	0
0							1	0%	Yes	1	No	0	No	0	No	0	No	0	No	0
							2	0%	Yes	1	No	0	No	0	No	0	No	0	No	0
							3	0%	Yes	1	No	0	No	0	No	0	No	0	No	0
							4	0%	Yes	1	No	0	No	0	No	0	No	0	No	0
							5	0%	Yes	1	No	0	No	0	No	0	No	0	No	0
							6	0%	Yes	1	No	0	No	0	No	0	No	0	No	0
							7	0%	Yes	1	No	0	No	0	No	0	No	0	No	0
							8	0%	Yes	1	No	0	No	0	No	0	No	0	No	0
							9	0%	Yes	1	No	0	No	0	No	0	No	0	No	0
								TOTAL		10		0		0		0		0		0
0	0	0	0	0	0	0	0	0%	Yes	1	No	0	No	0	No	0	No	0	No	0
0							1	0%	Yes	1	No	0	No	0	No	0	No	0	No	0
							2	0%	Yes	1	No	0	No	0	No	0	No	0	No	0
							3	0%	Yes	1	No	0	No	0	No	0	No	0	No	0
							4	0%	Yes	1	No	0	No	0	No	0	No	0	No	0
							5	0%	Yes	1	No	0	No	0	No	0	No	0	No	0
							6	0%	Yes	1	No	0	No	0	No	0	No	0	No	0
							7	0%	Yes	1	No	0	No	0	No	0	No	0	No	0
							8	0%	Yes	1	No	0	No	0	No	0	No	0	No	0
							9	0%	Yes	1	No	0	No	0	No	0	No	0	No	0
								TOTAL		10		0		0		0		0		0
0	0	0	0	0	0	0	0	0%	Yes	1	No	0	No	0	No	0	No	0	No	0
0							1	0%	Yes	1	No	0	No	0	No	0	No	0	No	0
							2	0%	Yes	1	No	0	No	0	No	0	No	0	No	0
							3	0%	Yes	1	No	0	No	0	No	0	No	0	No	0
							4	0%	Yes	1	No	0	No	0	No	0	No	0	No	0
							5	0%	Yes	1	No	0	No	0	No	0	No	0	No	0
							6	0%	Yes	1	No	0	No	0	No	0	No	0	No	0
							7	0%	Yes	1	No	0	No	0	No	0	No	0	No	0
							8	0%	Yes	1	No	0	No	0	No	0	No	0	No	0
							9	0%	Yes	1	No	0	No	0	No	0	No	0	No	0
								TOTAL		10		0		0		0		0		0

Appendix A

Part 1-Section B
TYPE 1 NUMBERS

_____ *NPA*
RATE CENTER _____

UTILIZATION STUDY FORMAT

INFORMATION						ASSIGNED	ADMINISTRATIVE				INTER-MEDIATE	RESERVED	AGING			UNAVAILABLE	AVAILABLE
OCN	Donor SP	Rate Center	NPA	NXX-X	TN RANGE	TOTAL	Internal /Official	Test	Other	TOTAL	TOTAL	TOTAL	RES	BUS	TOTAL	TOTAL	TOTAL
						0	0	0	0	0	0	0	0	0	0	0	#NAME?
						0	0	0	0	0	0	0	0	0	0	0	#NAME?
						0	0	0	0	0	0	0	0	0	0	0	#NAME?
						0	0	0	0	0	0	0	0	0	0	0	#NAME?
						0	0	0	0	0	0	0	0	0	0	0	#NAME?
						0	0	0	0	0	0	0	0	0	0	0	#NAME?
						0	0	0	0	0	0	0	0	0	0	0	#NAME?
						0	0	0	0	0	0	0	0	0	0	0	#NAME?
						0	0	0	0	0	0	0	0	0	0	0	#NAME?
						0	0	0	0	0	0	0	0	0	0	0	#NAME?
						0	0	0	0	0	0	0	0	0	0	0	#NAME?
					Total>>	0	0	0	0	0	0	0	0	0	0	0	#NAME?
					0	0	0	0	0	0	0	0	0	0	0	0	#NAME?
					1	0	0	0	0	0	0	0	0	0	0	0	#NAME?
					2	0	0	0	0	0	0	0	0	0	0	0	#NAME?
					3	0	0	0	0	0	0	0	0	0	0	0	#NAME?
					4	0	0	0	0	0	0	0	0	0	0	0	#NAME?
					5	0	0	0	0	0	0	0	0	0	0	0	#NAME?
					6	0	0	0	0	0	0	0	0	0	0	0	#NAME?
					7	0	0	0	0	0	0	0	0	0	0	0	#NAME?
					8	0	0	0	0	0	0	0	0	0	0	0	#NAME?
					9	0	0	0	0	0	0	0	0	0	0	0	#NAME?
					Total>>	0	0	0	0	0	0	0	0	0	0	0	#NAME?

Appendix A

Part 1-Section B
TYPE 1 CONTAMINATION LEVELS

_____ *NPA*
RATE CENTER _____

UTILIZATION STUDY FORMAT

INFORMATION						CONTAMINATION LEVELS												
OCN	Donor SP	Rate Center	NPA	NXX-X	TN RANGE	Contamination %	0%	Quantity	0%<=10%	Quantity	10%<=15%	Quantity	15% <=20%	Quantity	20% <=25%	Quantity	>25%	Quantity
0	0	0	0	0	0	0%	Yes	1	No	0	No	0	No	0	No	0	No	0
0					0	0%	Yes	1	No	0	No	0	No	0	No	0	No	0
					0	0%	Yes	1	No	0	No	0	No	0	No	0	No	0
					0	0%	Yes	1	No	0	No	0	No	0	No	0	No	0
					0	0%	Yes	1	No	0	No	0	No	0	No	0	No	0
					0	0%	Yes	1	No	0	No	0	No	0	No	0	No	0
					0	0%	Yes	1	No	0	No	0	No	0	No	0	No	0
					0	0%	Yes	1	No	0	No	0	No	0	No	0	No	0
					0	0%	Yes	1	No	0	No	0	No	0	No	0	No	0
					0	0%	Yes	1	No	0	No	0	No	0	No	0	No	0
					Total>>			10		0		0		0		0		0
0	0	0	0	0	0	0%	Yes	1	No	0	No	0	No	0	No	0	No	0
0					1	0%	Yes	1	No	0	No	0	No	0	No	0	No	0
					2	0%	Yes	1	No	0	No	0	No	0	No	0	No	0
					3	0%	Yes	1	No	0	No	0	No	0	No	0	No	0
					4	0%	Yes	1	No	0	No	0	No	0	No	0	No	0
					5	0%	Yes	1	No	0	No	0	No	0	No	0	No	0
					6	0%	Yes	1	No	0	No	0	No	0	No	0	No	0
					7	0%	Yes	1	No	0	No	0	No	0	No	0	No	0
					8	0%	Yes	1	No	0	No	0	No	0	No	0	No	0
					9	0%	Yes	1	No	0	No	0	No	0	No	0	No	0
					Total>>			10		0		0		0		0		0

Appendix A

Part 2 *NPA* UTILIZATION STUDY FORMAT

SERVICE PROVIDER:										
REPORT DATE:				As of 4/30/2000						
SPECIAL USE IDENTIFICATION:										
								TIME, WEATHER, HVC, ETC.		
	NXX:						PURPOSE:			
	NXX:						PURPOSE:			
	NXX:						PURPOSE:			
	NXX:						PURPOSE:			
	NXX:						PURPOSE:			
	NXX:						PURPOSE:			
	NXX:						PURPOSE:			
	NXX:						PURPOSE:			
ASSIGNED NUMBERS:										
	Total quantity of assigned TNs that are non-working wireless in the NPA:									
INTERIM LOCAL NUMBER PORTABILITY (INP):										
	Total quantity of assigned TNs dedicated to INP in the NPA:									

Appendix A

Part 2 *NPA* UTILIZATION STUDY FORMAT

TYPE 1 INTERCONNECTIONS:										
	DONORS: Identified as SPs that have assigned Type 1 numbers to other SPs:									
	NXX-X	*TELEPHONE NUMBER RANGE*	*QUANTITY OF TNs ASSIGNED*	*RATE CENTER*	*RECIPIENT SERVICE PROVIDER*					*RECIPIENT SP's OCN*

Appendix A

DEFINITIONS FOR UTILIZATION STUDY

Administrative: Administrative numbers are numbers used by telecommunications carriers to perform internal administrative or operational functions necessary to maintain reasonable quality of service standards. Subcategories used in the Utilization Studies are:

- ? Internal Business Purpose/Official Numbers: A number assigned by a service provider for its own internal business purposes
- ? Test Numbers: Telephone numbers (TNs) assigned for inter- and intra-network testing purposes
- ? Other Administrative Numbers (include only Location Routing Number, Temporary Local Directory Number and Wireless E911 ESRD/ESRK) where
    - ? Identical to a Local Routing Number (LRN): The ten-digit (NPA-XXX-XXXX) number assigned to a switch/point of interconnection (POI) used for routing in a permanent local number portability environment
    - ? Temporary Local Directory Number (TLDN): A number dynamically assigned on a per call basis by the serving wireless service provider to a roaming subscriber for the purpose of incoming call setup
    - ? Wireless E-911 ESRD/ESRK: A ten-digit number used for the purpose of routing an E911 call to the appropriate Public Service Answering Point (PSAP) when that call is originating from wireless equipment. The ESRD identifies the cell site and sector of the call origination in a wireless call scenario. The Emergency Services Routing Key (ESRK) uniquely identifies the call in a given cell site/sector and correlates data that is provided to a PSAP by different paths, such as the voice path and the Automatic Location Identification (ALI) data path. Both the ESRD and ESRK define a route to the proper PSAP. The ESRK alone, or the ESRD and/or Mobile Identification Number (MIN), is signaled to the PSAP where it can be used to retrieve from the ALI database, the mobile caller's call-back number, position and the emergency service agencies (e.g., police, fire, medical, etc.) associated with the caller's location. If a NANP telephone number is used as an ESRD or ESRK, this number cannot be assigned to a customer.
    - ? For convenience, "other administrative numbers" are reported as a group for purposes of the Utilization Study

Aging Numbers: Aging numbers are disconnected numbers that are not available for assignment to another end user or customer for a specified period of time. Numbers previously assigned to residential customers may be aged for no more than 90 days. Numbers previously assigned to business customers may be aged for no more than 360 days. For purposes of the Utilization Study, carriers are to separately report aging numbers associated with residential service from those associated with business service.

Assigned Numbers: Assigned numbers are numbers working in the Public Switched Telephone Network under an agreement such as a contract or tariff at the request of specific end users or customers for their use, or numbers not yet working but having a customer service order pending. Numbers that are not yet working and have a service order pending for more than five days shall not be classified as assigned numbers. For purposes of the Utilization Studies, numbers for non-working wireless and for interim number portability are to be considered as assigned numbers in Part 1-Section A and separately identified in Part 2. See Interim Number Portability and Non-Working Wireless for definitions.

Available Numbers: Available numbers are numbers that are available for assignment to subscriber access lines, or their equivalents, within a switching entity or point of interconnection and are not classified as assigned, intermediate, administrative, aging, or reserved.

COC Type: Three-digit element defining the use of the Central Office Code (codes such as 0XX used for access tandem and testboard addressing or a "+" symbol that indicates direct routing to the designated switch in the NPA. 2XX-9XX values are considered NXXs.)
Allowable codes in the LERG Destination Code by LATA and Tandem Homing Arrangements (LERG 6/9) are:

ATC = Access Tandem Code (0/1XX)
CDA = Customer Directory Assistance only (555 line numbers are assigned by the North American Numbering Plan Administration)
EOC = End Office Code
PLN = Planned Code - non-routable
PMC = Public Mobile Carrier (Type 2 Interconnected)
RCC = Radio Common Carrier (Dedicated Type 1 Interconnected)
SIC = Special 800 Service Code
SP1 = Service Provider - Miscellaneous Service (Type 1 Interconnected)
SP2 = Service Provider - Miscellaneous Service (Type 2 Interconnected)
TST = Standard Plant Test Code

Allowable codes in the LERG Oddball file (LERG6ODD only) are:
700 = 700 IntraLATA Presubscription
AIN = Advanced Intelligent Network
BLG = Billing Only
BRD = Broadband
CTV = Cable Television
ENP = Emergency Preparedness
FGB = Feature Group B Access
HVL = High Volume
INP = Information Provider
LTC = Local Test Code
N11 = N11 Code
ONA = Open Network Architecture
PRO = Protected
RSV = Reserved

RTG = Routing Only
UFA = Unavailable for Assignment

Interim Number Portability (INP): The interim ability to move telephone service from one service provider to another service provider using Remote Call Forwarding (RCF), Direct Inward Dialing (DID), or equivalent means where:

? Remote Call Forwarding allows a customer to have a local telephone number in a distant location. Every time someone calls that number, that call is forwarded to the RCF customer in the distant location. Remote call forwarding is similar to call forwarding on a residential line, except that the RCF customer has no phone, no office and no physical presence in that location.
? A DID (Direct Inward Dial) trunk is a trunk from the Central office which passes the last two to four digits of the Listed Directory Number into the PBX, thus allowing the PBX to switch the call to and thus ring the correct extension" without the use of an attendant (Newton's Telecom Dictionary). Existing DID retail service is limited to PBX services. For purposes of providing INP, Pacific and GTEC will use the DID switch functionality to provide INP to any CLC customer regardless of the type of terminal equipment used on the customers' premises.
? For the purposes of the Utilization Study, each carrier must report the quantity of its assigned numbers that are dedicated to providing INP under Assigned Numbers in Part 1-Section A and separately identified in Part 2.

Intermediate Numbers: Intermediate numbers are numbers that are made available for use by another telecommunications carrier or non-carrier entity for the purpose of providing telecommunications service to an end user or customer. Numbers ported for the purpose of transferring an established customer's service to another service provider shall not be classified as intermediate numbers. For Type 1 donor carriers, Type 1 numbers are to be reported as intermediate numbers in Part 1-Section A and detailed information is to be provided in Part 2 for the Utilization Studies. For Type 1 recipient donors, Type 1 numbers shall be reported in the Part 1-Section B for the Utilization Studies. For definition, see Type 1 numbers.

Local Number Portability: The ability to move a telephone number from one service provider to another service provider using LRN-LNP technology

Non-Working Wireless: this category is for wireless companies only to report numbers that they have already assigned to customer equipment, but are not yet working. For example, cellular carriers often pre-package a cellular telephone with an assigned telephone number for sale to customers. Those phone numbers are assigned, but are not actually activated until after the customer purchase is made. For the purposes of the Utilization Study, each carrier must report the quantity of its non-working wireless numbers under Assigned Numbers in Part 1-Section A and separately identified in Part 2.

OCN: Operating Company Number (OCN) assignments must uniquely identify the applicant. Relative to CO Code assignments, NECA-assigned Company Codes may be used as OCN's. Companies with no prior CO Code or Company Code assignments should contact NECA (973-

884-8355) to be assigned a Company Code(s). Since multiple OCNs and/or Company codes may be associated with a given company, companies with prior assignments should direct questions regarding appropriate OCN usage to the Traffic Routing Administration (TRA) on 732-699-6700

Reserved Numbers: Reserved numbers are numbers that are held by service providers at the request of specific end users or customers for their future use. Numbers held for specific end users or customers for more than 45 days shall not be classified as reserved numbers.

Special Use NXX Codes: Certain NXX codes have traditionally been reserved or designated for special uses, and have not been available for assignment by carriers for general commercial use in providing telephone numbers to customers. These NXX prefixes are restricted to such special uses as recorded public information announcements of time-of-day and weather forecasts, high-volume call-in numbers, and emergency access numbers used by the Federal Emergency Management Administration (FEMA), etc.

Type 1 Numbers: numbers pursuant to a Type 1 interconnection agreement. The Type 1 interconnection is a connection between a mobile/wireless service provider and an end office of another service provider for the purpose of originating and terminating traffic or for access to end user services (i.e. DA, Operator services, 911, etc). The interconnection consists of a facility between the mobile/wireless service provider and the end office, switch usage, and telephone numbers (only required if the mobile carrier wishes to receive originating (L/M) traffic). For the purposes of the 310 Utilization Study, both mobile/wireless service providers who have received Type 1 numbers and those service providers who have provided Type 1 numbers to mobile/wireless service providers are asked to report on those numbers at the 1000 block level.

Appendix A
Table A-1
Code Holders in 415 NPA Who Submitted Data

1 Advanced Telcom Group, Inc. - CA
2 Airtouch Paging - California
3 Allegiance Telecom, Inc.-CA
4 AT&T Local
5 Bay Area Cellular Telephone
6 Brooks Fiber Communications - California
7 CCCA, Inc. dba Connect! - CA
8 Cook Telecom, Inc.
9 Digitcom Services, Inc.
10 Focal Communications Corp of California
11 Frontier Local Services, Inc.-CA
12 GST Lightwave, Inc.-California
13 GTE Co of California
14 GTE Mobilnet of California
15 ICG Telecom Group - CA
16 Level 3 Communications, LLC-CA
17 Map Mobile Communications, Inc.
18 MCIMetro, ATS, Inc.
19 Message Center Beepers, Inc
20 Metrocall
21 MGC Communications, Inc.-CA
22 Mobilecomm
23 Network Services LLC
24 Nextel Communications
25 Nextlink of California
26 North County Communications Corp.-CA
27 O1 Communications, Inc.
28 Optel California Telecom, Inc
29 Pacific Bell
30 Pacific Bell - CLEC
31 Pacific Bell Mobile Services
32 Pac-West Telecomm, Inc.
33 Pagemart, Inc.
34 Pagenet
35 Paging Plus
36 RCN Telecom Services Inc
37 San Diego Paging
38 Sprint Spectrum L.P.
39 Teleport Communications Group - San Francisco
40 Teligent, Inc.-CA
41 The Westlink Company
42 TSR Wireless LLC
43 U.S. Telepacific Corp.-CA
44 Winstar Wireless, Inc.-CA
45 Worldcom Technologies, Inc.-CA

APPENDIX B

Table B-1

3.9 million Available Numbers

Wireline Carriers		2,144,757
Wireless Carriers		637,437
Late Wireless Filer		13,469
Type 1 Carriers		48,061
	Subtotal	2,843,724
Available for lottery		720,000
Set aside for number pooling		360,000
	Total	3,923,724

The 2.8 million numbers assigned to carriers are broken down as:

	Blocks	Numbers
Wireline Carriers		
Blocks with 0% contamination	1,129	1,129,000
Blocks with more than 0% up to 10%	365	351,773
Blocks with more than 10% up to 15%	49	43,503
Blocks with more than 15% up to 20%	64	51,597
Blocks with more than 20% up to 25%	42	32,870
Blocks with more than 25% contam.	3,361	536,014
Total Available Numbers		2,144,757
Wireless Carriers		
Blocks with 0% contamination	214	214,000
Blocks with more than 0% up to 10%	101	97,927
Blocks with more than 10% up to 15%	20	17,470
Blocks with more than 15% up to 20%	20	16,454
Blocks with more than 20% up to 25%	27	20,853
Blocks with more than 25% contam.	1,168	270,733
Subtotal		637,437
Late wireless filer:		
Blocks with more than 15% to 20% (a)	1	824
Blocks with more than 25%	19	12,645
Total Available Numbers		650,906
Type 1 Carriers		
Reported as Intermediate Numbers by Donors		116,110
Reported as Unavailable Numbers by Type 1 Carriers		(55,501)
Est. of Unavailable Numbers of Remaining Type 1 Carriers(b)		(12,548)
Total Available Numbers		48,061

(a) The late wireless filer did not have any blocks with contamination levels of 0% up to 15% or 20% to 25%.

(b) Of the 116,110 numbers reported by donors as Type 1 numbers, Type 1 recipients only reported on 94,700 numbers with 55,501 as unavailable and 39,199 as available. Therefore, 21,410 numbers are unaccounted for. Staff estimated the unavailable numbers for the unaccounted numbers using the same ratio as numbers that were reported, namely 55,501 divided by 94,700.

Appendix B
Table B-2
Numbers Potentially Available Under Different Pooling Scenarios

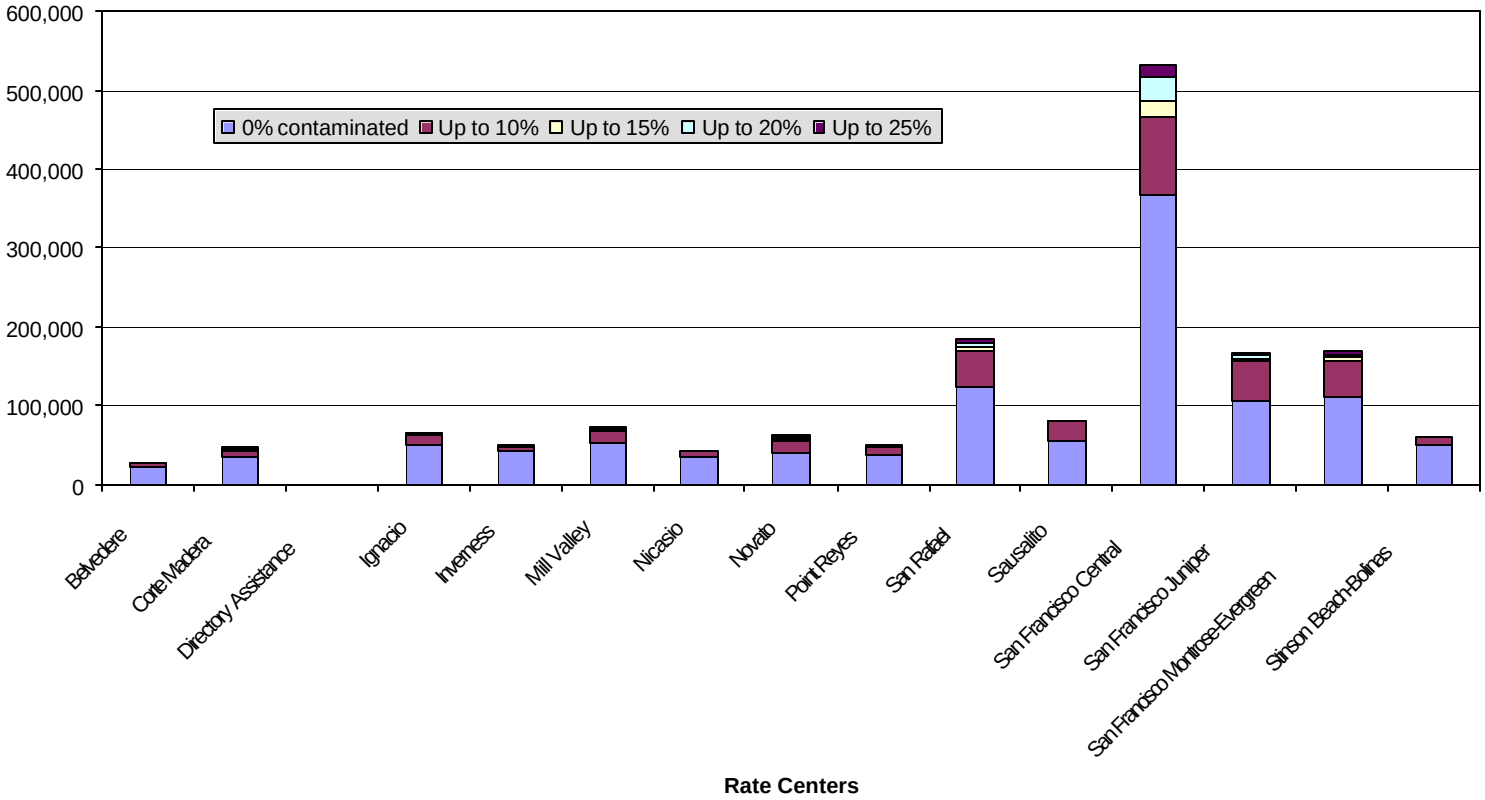
		Running Total
Wireline Carriers: Current Level at 10% or less (1)	1,421,029	
Set Aside for Pooling	360,000	
Available for Lottery	720,000	
Subtotal	2,501,029	2,501,029
Other Possibilities for Pooling:		
Available Numbers for non LNP blocks of Wireline Carriers	49,834	2,550,863
Available Numbers from Special Use Codes	9,910	2,560,773
Unavailable Numbers from Special Use Codes (2)	40,000	2,600,773
Wireline Carriers: Up to 15%	43,503	2,644,276
Wireline Carriers: Up to 20%	51,597	2,695,873
Wireline Carriers: Up to 25%	32,870	2,728,743
Cellular and PCS Carriers: Up to 10% (3)	202,753	2,931,496
Cellular and PCS Carriers: Up to 15% (3)	11,356	2,942,851
Cellular and PCS Carriers: Up to 20% (3)	11,231	2,954,082
Cellular and PCS Carriers: Up to 25% (3)	13,554	2,967,636
Type 1 Carriers: Up to 10%	2,909	2,970,545
Type 1 Carriers: More than 10% up to 25%	9,392	2,979,937
Paging Carriers: Up to 10% (3)	109,174	3,089,112
Paging Carriers: Up to 15% (3)	6,115	3,095,226
Paging Carriers: Up to 20% (3)	6,047	3,101,273
Paging Carriers: Up to 25% (3)	7,299	3,108,572
Total	3,108,572	

(1) Carriers are allowed to maintain a six month inventory so actual donated to pooling is a maximum of 640,000 numbers as of August 18, 2000.

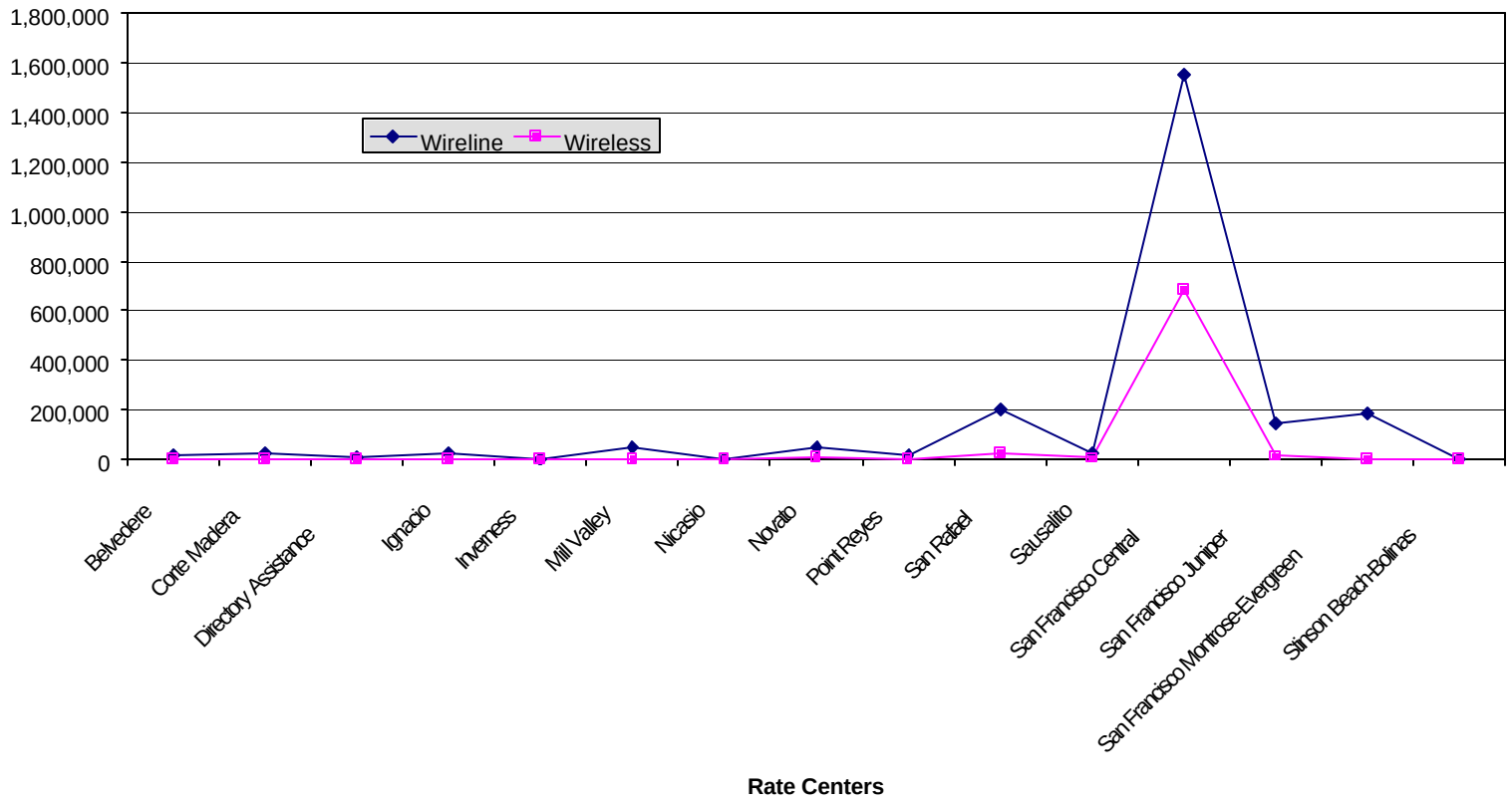
(2) See discussion on special use codes in Section E.1.c.

(3) While cellular and PCS carriers have until November 2002 to become LNP capable, paging companies currently are totally exempted. Therefore, TD estimated the percentage of prefixes held by cellular and PCS (65%) vs. paging (35%) and applied the percentage to the available numbers.

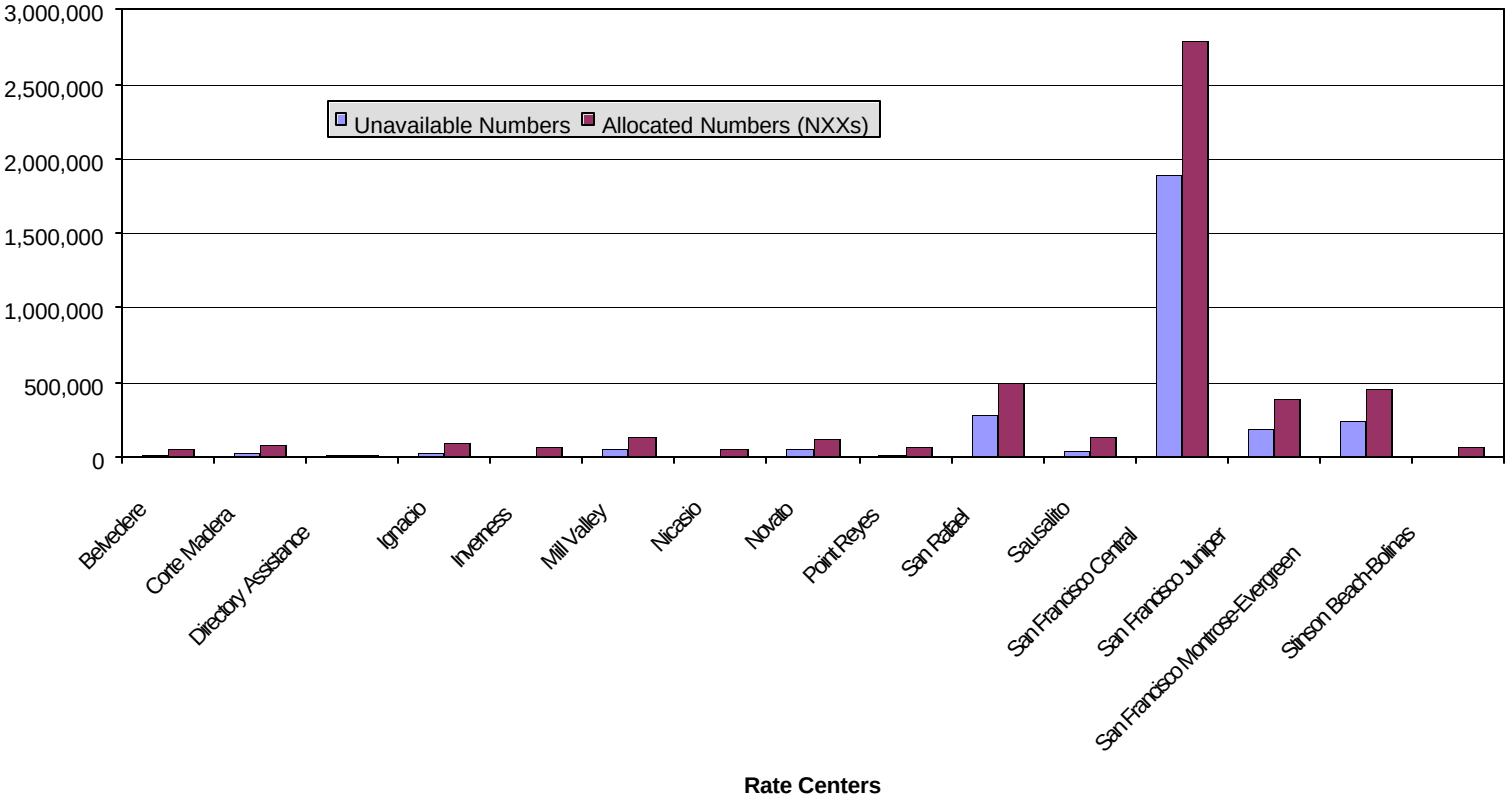
Appendix B
Table B-3
Wireline Carriers: Available Numbers by Contamination Level up to 25%



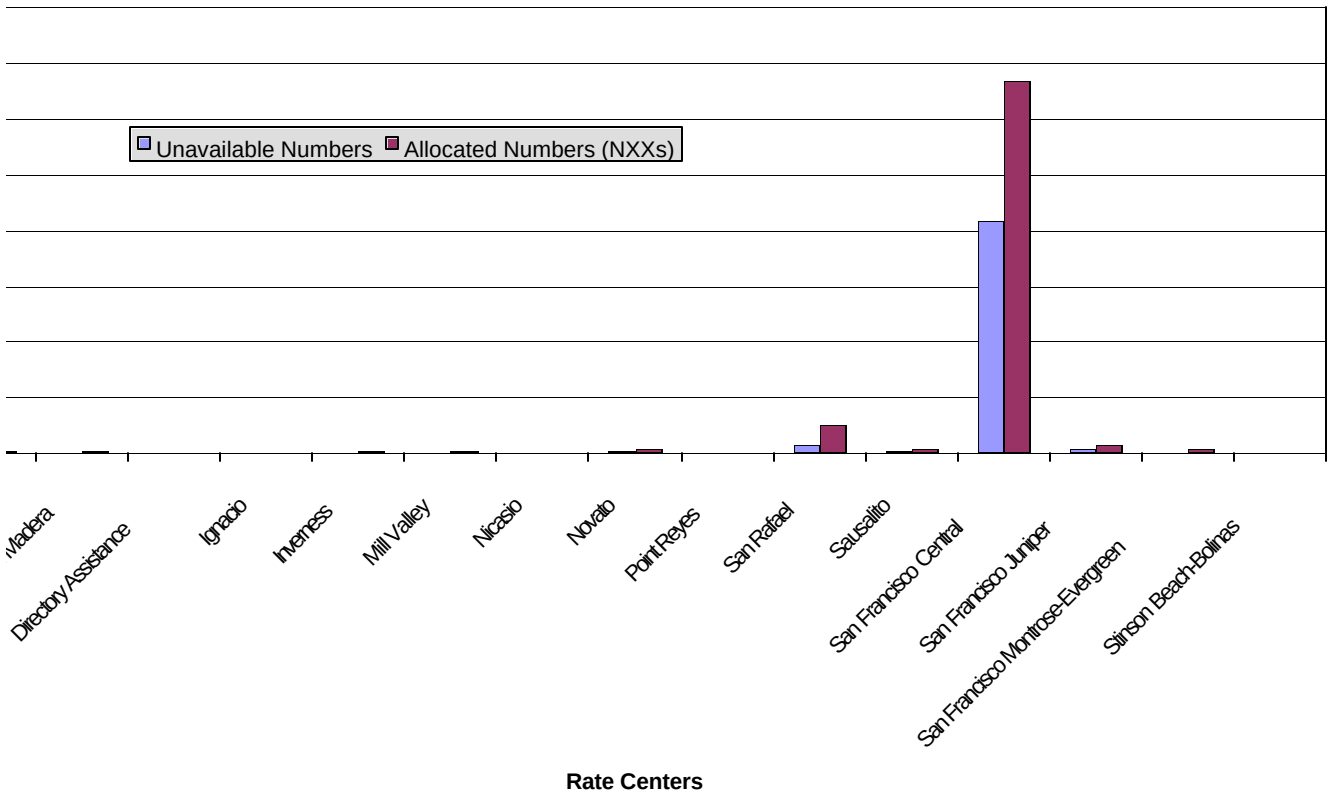
Appendix B
Table B-4
Telephone Numbers Assigned by Wireline and Wireless



Appendix B
Table B-5
Unavailable to Allocated Numbers for Wireline Carriers



Appendix B
Table B-6
Unavailable to Allocated Numbers for Wireless Carriers



APPENDIX C

415 SPECIAL USE CODES

NXX	PURPOSE	ASSIGNED	UNAVAILABLE	AVAILABLE
478	High Volume Calling	10000	90	9910
555	Directory Assistance	10000	10000	0
700	700 IntraLATA Presubscription	10000	10000	0
767	Time Service	10000	10000	0
919	Emergency Preparedness Service	10000	10000	0
936	Weather Service	10000	10000	0

APPENDIX D
Table D-1

Wireline Reserved Numbers in the 415 NPA		
Rate Center	Number of Wireline Carriers	Reserved Numbers
BELVEDERE	4	3384
CORTE MADERA	6	4738
IGNACIO	7	1940
INVERNESS	6	2714
MILL VALLEY	9	6650
NICASIO	5	1524
NOVATO	7	45
POINTE REYES	7	2076
SAN RAFAEL	19	24427
SAUSALITO	10	8508
SAN FRANCISCO CENTRAL	24	190,038
SAN FRANCISCO JUNIPER	17	13801
SAN FRANCISCO MONTROSE-EVRGRN	17	42756
STINSON BEACH BOLINAS	7	2,032
Total		304,633

APPENDIX D
Table D-2

Wireless Reserved Numbers in the 415 NPA		
Rate Center	Number of Wireless Carriers	Reserved Numbers
BELVEDERE	1	1000
CORTE MADERA	1	0
IGNACIO	0	0
INVERNESS	1	0
MILL VALLEY	1	0
NICASIO	0	0
NOVATO	2	2
POINTE REYES	0	0
SAN RAFAEL	9	955
SAUSALITO	2	4
SAN FRANCISCO CENTRAL	21	8,907
SAN FRANCISCO JUNIPER	3	19
SAN FRANCISCO MONTROSE-EVRGRN	2	0
STINSON BEACH BOLINAS	0	0
Total		10,887

APPENDIX E
Table E-1

Wireline Administrative Numbers in the 415 NPA					
Rate Center	Number of Wireline Carriers	Employee/ Official Numbers	Test	Other	Total Admin Numbers
BELVEDERE	4	600	152	1	753
CORTE MADERA	6	620	258	0	878
IGNACIO	7	642	562	1	1205
INVERNESS	6	501	108	1	610
MILL VALLEY	9	507	728	2	1237
NICASIO	5	600	802	1	1403
NOVATO	7	1003	259	2	1264
POINTE REYES	7	607	248	4	859
SAN RAFAEL	19	1132	1642	159	2933
SAUSALITO	10	604	469	4	1077
SAN FRANCISCO CENTRAL	24	3534	8,870	237	12,625
SAN FRANCISCO JUNIPER	17	527	1550	5	2082
SAN FRANCISCO MONTROSE-EVRGRN	17	439	1889	5	2333
STINSON BEACH BOLINAS	7	600	233	1	834
Total		11,916	17,770	423	30,093

APPENDIX E
Table E-2

Wireless Administrative Numbers in the 415 NPA					
Rate Center	Number of Wireless Carriers	Employee / Official Numbers	Test	Other	Total Admin Numbers
BELVEDERE	1	3	0	0	3
CORTE MADERA	1	50	4	0	54
IGNACIO	0	0	0	0	0
INVERNESS	1	40	4	0	44
MILL VALLEY	1	60	4	0	64
NICASIO	0	0	0	0	0
NOVATO	2	102	26	229	357
POINTE REYES	0	0	0	0	0
SAN RAFAEL	9	68	85	0	153
SAUSALITO	2	150	5	229	384
SAN FRANCISCO CENTRAL	21	2421	7,399	3340	13,160
SAN FRANCISCO JUNIPER	3	8	5	0	13
SAN FRANCISCO MONTROSE-EVRGRN	2	14	24	0	38
STINSON BEACH BOLINAS	0	0	0	0	0
Total		2,916	7,556	3,798	14,270

APPENDIX F
Table F-1

Wireline Intermediate Numbers in the 415 NPA		
Rate Center	Number of Wireline Carriers	Intermediate Numbers
BELVEDERE	4	0
CORTE MADERA	6	0
IGNACIO	7	0
INVERNESS	6	0
MILL VALLEY	9	3400
NICASIO	5	1524
NOVATO	7	0
POINTE REYES	7	0
SAN RAFAEL	19	39700
SAUSALITO	10	0
SAN FRANCISCO CENTRAL	24	54,345
SAN FRANCISCO JUNIPER	17	21650
SAN FRANCISCO MONTROSE-EVRGRN	17	0
STINSON BEACH BOLINAS	7	0
Total		120,619

APPENDIX F
Table F-2

Wireless Intermediate Numbers in the 415 NPA		
Rate Center	Number of Wireless Carriers	Intermediate Numbers
BELVEDERE	1	0
CORTE MADERA	1	0
IGNACIO	0	0
INVERNESS	1	0
MILL VALLEY	1	0
NICASIO	0	0
NOVATO	2	1686
POINTE REYES	0	0
SAN RAFAEL	9	2631
SAUSALITO	2	1822
SAN FRANCISCO CENTRAL	21	78,198
SAN FRANCISCO JUNIPER	3	1047
SAN FRANCISCO MONTROSE-EVRGRN	2	0
STINSON BEACH BOLINAS	0	0
Total		85,384

APPENDIX G

TABLE G-1			
AGING NUMBERS IN THE 415 NPA			
	RESIDENTIAL	BUSINESS	TOTAL
WIRELINE	339	115,635	115,974
WIRELESS	27,905	46,030	73,935
TOTAL NUMBERS	28,244	161,665	189,909

APPENDIX H

NUMBER POOLING

310 Pooling Updates (as of August 18, 2000)

1	6	7	8	9	10
Rate Center	Initial Forecast Blocks by Carriers for 2000 Q3	Blocks Assigned by Pooling Administrator for 2000 Q3	Initial Blocks Forecasted by Carriers Year -to-Date	Blocks Assigned by Pooling Administrator Year -to-Date	Blocks Remaining from Carrier-Donation to the 310 pool
AVALON	1	0	2	1	1
BEVERLY HILLS	26	1	58	7	85
CMTN CMTN	13	1	37	5	32
CMTN GRDN	19	0	42	6	65
CULVER CITY	13	0	35	8	32
EL SEGUNDO	20	0	52	8	38
HAWTHORNE	19	0	41	8	27
INGLEWOOD	17	0	43	8	54
LOMITA	12	1	27	5	18
MALIBU	11	0	28	7	18
REDONDO	18	1	42	7	62
SAN PEDRO	10	0	51	7	35
SNMN MRVS	25	1	79	8	53
SNMN SNMN	32	3	46	10	53
TORRANCE	23	1	51	8	60
W ANGELES	27	2	76	10	53
TOTAL	286	11	710	113	686

One Block = 1 thousand numbers

415 Pooling Updates (as of August 18, 2000)

1	2	3	4	5	6
Rate Center	Forecast Blocks by Carriers for 2000 Q3	Blocks Assigned by Pooling Administrator for 2000 Q3	Initial Blocks Forecasted by Carriers Year -to-Date	Blocks Assigned by Pooling Administrator Year -to-Date	Blocks Remaining from Carrier-Donation to the 415 pool
BELVEDERE	3	1	3	1	21
CORTEMADRA	6	3	6	3	26
IGNACIO	6	4	6	4	39
IVERNESS	3	0	3	0	27
MILL VALLEY	6	3	6	3	37
NICASIO	3	0	3	0	21
NOVATO	8	5	8	5	32
POINT REYES	3	0	3	0	25
SAN RAFAEL	6	1	6	1	67
SAUSALITO	5	0	5	0	37
SNFC CNTRL	75	0	75	0	110
SNFC JUNIPER	16	1	16	1	76
SNFC MT-EV	21	0	21	0	73
STNSN-BLNS	3	0	3	0	31
TOTAL	164	18	164	18	622

One Block = 1 thousand numbers

APPENDIX I

SUMMARY OF RECOMMENDATIONS

The Following Contains A Comprehensive List of Recommendations Contained In This Report:

Recommendation for Prefixes Held by Companies No Longer in Service

? *For the prefixes not yet returned, the CPUC should take action to require NANPA to reclaim the prefixes.*

Recommendations from Block Contamination Analysis for Wireless Carriers

? *When cellular and PCS companies become LNP capable in November 2002, the CPUC should direct those wireless carriers to donate to and participate in the pool.*

? *The CPUC should adopt a 25% contamination threshold for donated blocks from wireless carriers to the pool.*

? *The CPUC should solicit comments on the feasibility of paging companies becoming LNP capable and participating in pooling.*

? *If deemed feasible, the CPUC should petition the FCC to rescind the paging companies' permanent exemption on becoming LNP capable.*

Recommendation for Block Contamination Issues Affecting All Companies

? *The CPUC should monitor compliance with its fill rate and sequential numbering policies through future number utilization filings and audits.*

? *The CPUC should establish penalties for non-compliance with fill rate and sequential numbering policies adopted in Decision 00-07-052.*[68]

Recommendation for Reclamation of Prefixes

? *An order should be issued requiring the NANPA to notify the CPUC when a prefix has not been placed in service*

[68] See Chapter 1 for the discussion on Decision 00-07-052.

during the legally required time period for every California area code. The order should specify the procedures that the CPUC will follow in directing the NANPA to reclaim unused prefixes, and should require the NANPA to notify the CPUC of the steps the NANPA has taken to reclaim a prefix.

Recommendations For Treatment of Non-Working Wireless

- ? *Non-Working wireless numbers should be treated as reserved numbers and limited to 45 days, after which they should be treated as available for assignment to customers.*
- ? *Companies should be required to maintain and update regularly the inventory records of all equipment assigned non-working wireless numbers along with the number assigned and submit such records to the CPUC upon request.*
- ? *The CPUC should continue to monitor non-working wireless numbers in the near term by reviewing future utilization filings and include this category of numbers in any audits conducted of wireless carrier number use.*

Recommendation for INP-Related Conservation Measures

- ? *The CPUC should require companies to transition from INP to LNP in the 415 area code and implement a monitoring mechanism to ensure compliance.*
- ? *The CPUC should adopt a schedule for transitioning INP arrangements to LNP in all other California area codes.*

Recommendations for Special-Use Prefixes

- ? *TD recommends that the CPUC initiate an investigation into the possibility of moving the number for time, emergency preparedness, weather service and 700 IntraLata Presubscription into the 555 prefix.*

? *TD recommends that the CPUC include in its investigation the broader use of the 555 prefix in California's area codes by providing standard 555 numbers in every California area code to provide time, emergency preparedness, and weather information.*

? *TD recommends that the CPUC solicit comments in the Local Competition proceeding (R.95-04-043/I.95-04-044) regarding technical issues that would arise if 1,000 number blocks from the high-volume calling prefix are reclaimed and placed in the 415 number pool.*

? *TD recommends that CPUC require companies to assign numbers sequentially in special use prefixes. Where the numbers are presently assigned randomly, TD recommends that these numbers be moved and consolidated in one 1,000 block in order to free more blocks for number pooling*

Recommendations for Reserved Numbers

? *The CPUC should monitor reserved number use for all companies by reviewing future utilization data to ensure companies are complying with the FCC's 45-day requirement.*

? *The CPUC should adopt efficient number use practices specific to company's reserve number holdings. In developing these practices, the CPUC should investigate various alternatives including, but not limited to, 1) limits on the quantity or percentage of reserved numbers companies can hold, and 2) requirements for using reserved number resources prior to requesting new number resources.*

Recommendations for Administrative Numbers

? *The CPUC should develop criteria by which companies assign administrative numbers. The CPUC should consider placing a limit on the quantity or percentage of administrative numbers companies are allowed to hold.*

? *The CPUC should develop rules that require companies to limit administrative number assignments within certain blocks in a given prefix. In cases in which companies hold multiple prefixes in a single rate center, the CPUC should develop rules that require companies to limit administrative number assignments within prefixes.*

Recommendations for Intermediate Numbers

? *The CPUC should monitor intermediate number use for all companies by reviewing future utilization filings to test whether potential abuses in this reporting category occur.*

Recommendations for Type 1 numbers:

? *Wireline and wireless carriers should improve Type 1 number inventory management. Wireline carriers should perform an annual inventory check of wireless Type 1 numbers to confirm that wireless companies are using the numbers allocated to them. Companies should make inventory data available to the CPUC upon request. Wireline companies should reclaim unused numbers within 60 days.*

? *Type 1 carriers should be subject to number conservation techniques such as sequential numbering and fill rates. A system to ensure compliance with Type 1 number conservation measures should be developed.*

? *The CPUC should consider numbers held by Type 1 wireless carriers as candidates for number pooling. Excess and unused Type 1 numbers should be donated to the number pool.*

Recommendation for Aging Numbers

? *Although the CPUC has required all companies to differentiate between residential and business numbers in aging and track the two categories separately, Pacific Bell has failed to comply with these requirements. Pacific Bell should be redirected to*

differentiate between business and residential numbers in aging, track them separately, and report on each category accurately. The CPUC should assess penalties for failure to comply.

Recommendations for Audits

? *The CPUC should audit the data submitted by companies in this study and future area code utilization studies.*

Recommendations for Number Pooling

? *The CPUC should continue to urge the FCC to adopt a 75% fill rate requirement for pooling nationwide.*

? *The CPUC should work with industry groups and the Pooling Administrator to develop specific rules for companies pertaining to forecasting a six-month inventory when a number pool is authorized in a particular area code.*

Recommendation for non-compliant companies

? *The CPUC should re-direct Optel California to file, within one month, the block donation and six-month inventory reports with the CPUC. If Optel fails to submit these reports, the CPUC should establish penalties against Optel.*

Recommendations for LNP

? *The CPUC should encourage the FCC to resolve the contradiction in the texts ordering LNP capability for all wireline carriers in the top 100 MSAs.*

? *As soon as permitted by the FCC, the CPUC should request that non-LNP capable wireline carriers in the 415 area code become LNP capable within the time frame prescribed by the FCC, which in no case may exceed 6 months from the day the CPUC makes the request.*

? *In the meantime, companies, both inside and outside of the top 100 MSAs, should be encouraged to make requests of one another to become LNP capable.*

Recommendations for UNP

? *The CPUC should petition the FCC for authority to implement UNP statewide.*

? *The CPUC should solicit comments in order to develop rules and practices necessary to implement UNP.*

Recommendations for Rate Center Consolidation

? *The CPUC should undertake further investigation by ordering the telecommunications industry to develop a plan, within 180 days, for rate center consolidation.*

Recommendations for Sharing of Prefixes

? *The CPUC should further explore sharing of prefixes as a means to more efficiently utilize numbers in all area codes.*