

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.

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(Filed April 26, 1995)

**REPORT ON THE 650 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  
March 13, 2001

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# **REPORT ON THE 650 AREA CODE**

## **CALIFORNIA PUBLIC UTILITIES COMMISSION TELECOMMUNICATIONS DIVISION**

March 13, 2001

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## 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 650 area code, from its creation in August 1997 when it was geographically split from the 415 area code, one of the three original area codes in California when the North American Numbering Plan was created in 1947. Today, the 650 area code serves San Mateo County and northern portions of Santa Clara County north from Mountain View. This report should be viewed in a broader context than the facts pertaining solely to the 650 area code. The report evaluates the status of number availability in the 650 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 650 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 650 utilization data submitted for this study and report.

The utilization study sheds new light on the numbering crisis in the 650 area code. The data reveals that despite increasing demand for numbers, the 650 area code is not fully utilized. The study found that of the 7.6 million useable numbers in the 650 area code, approximately 5.0 million, or almost 2/3, presently

are not in use. The data further establishes that the 650 area code possesses considerable room for growth, and thus, aggressive measures such as splits or overlays are not yet warranted in the 650 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 650 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. In November 2000, TD completed utilization reports covering the 415, 510, 818, and 909 area codes. This report on the 650 area code continues TD's analysis covering specific area code number utilization levels.

## **FINDINGS**

The 650 area code contains approximately 7.6 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),<sup>1</sup> 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 that companies allocate to resellers to be "intermediate" numbers. In addition, each assigned number, after

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<sup>1</sup> 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.

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 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 defined numbers in these five categories – assigned, administrative, reserved, intermediate, or aging – as unavailable, either because they are already in use or are designated for some present or future use. Of the 5.0 million available numbers, approximately 1.8 million have been set aside by the CPUC to use in a lottery for companies seeking numbers. Companies possess the remaining unused 3.2 million numbers. Wireline carriers, such as Pacific Bell and many competitive local exchange carriers, hold roughly 2.7 million available numbers, while wireless carriers<sup>2</sup> hold approximately 563,000 available numbers.

At the same time, the 650 study finds that under FCC rules about 2.0 million numbers cannot be contributed to the 650 number lottery, nor can they be contributed to the future 650 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.<sup>3</sup> 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,<sup>4</sup> 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 they need to use those blocks within six months. The study further finds that of the 5.0 million numbers not in use, a maximum of 3.6 million numbers<sup>5</sup> could be made available to companies through pooling if a)

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<sup>2</sup> Including Type 1 Carriers. Type 1 numbers are described in Chapter 2, Sec. D. 4.a.

<sup>3</sup> 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.

<sup>4</sup> The percentage of numbers in use in a particular block of 1,000 numbers is referred to as the "contamination" level.

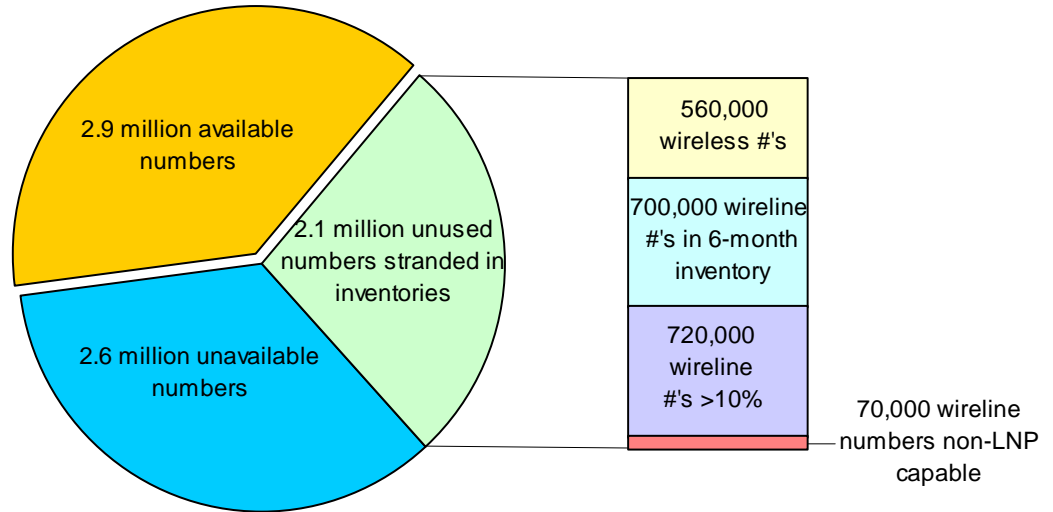
<sup>5</sup> This assumes that companies' six-month inventory needs would be satisfied out of the unused numbers

the companies donated blocks with higher contamination levels to the pool, and b) wireless carriers were required to participate in the 650 number pool. The first table below illustrates the current distribution of numbers assuming wireline pooling at 10% contamination. The second table shows the distribution that would occur if all the recommendations in this report were implemented.

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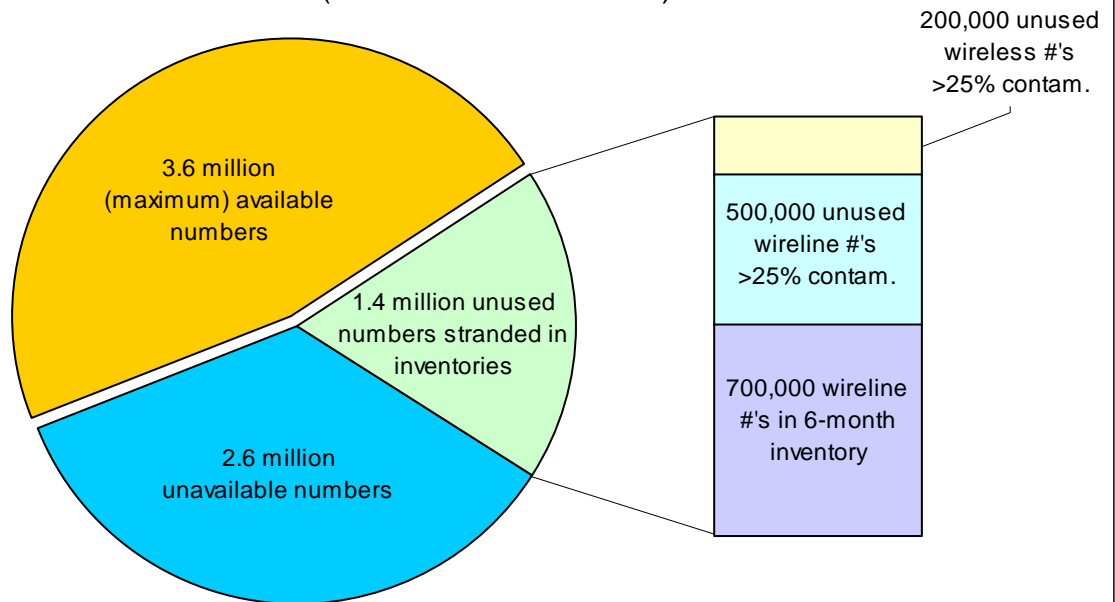
in the blocks greater than 25% contaminated.

2.9 Million Available Numbers Out Of 7.6 Million Total Numbers In 650 (With Current Rules)



In both graphs, numbers may not add to 100% due to rounding.

3.6 Million Available Numbers Out Of 7.6 Million Total Numbers In 650 (With Recommendations)





Finally, the study notes that companies identify 2.6 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 650 Area Code Report recommendations are summarized in Appendix I.

## **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 1940s that is inefficient in today's competitive marketplace.

Prior to 1997, one phone company<sup>6</sup> 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 three in 1947 to 13 in 1992, and stayed at that level until January 1997. 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. The Telecommunications Act of 1996 sought to open competition for the local telephone service market and competitive local phone companies<sup>7</sup> 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

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<sup>6</sup> Today called the Incumbent Local Exchange Carrier (ILEC)

<sup>7</sup> Today called Competitive Local Exchange Carriers (CLEC)

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 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 in California 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. 650 History and CPUC Decisions**

The 650 area code is a classic example of area code proliferation in California. Originally, the 650 area code was part of the 415 area code, one of the first three area codes created in California in 1947. The 415 area code originally covered all of central California. The following area codes now comprise what originally was the 415 area code: 209, 408, 415, 510, 559, 650, 831, 925, and portions of 530, 661, 707, 760, 805, and 916.

The 650 area code was created in August 1997 when it was split from the 415 area code. Today, the 650 area code serves San Mateo County and northern portions of Santa Clara County north from Mountain View. The area is located within the San Francisco and San Jose Metropolitan Statistical Areas (MSAs).

Despite the 1997 creation of this new area code, in June 1998 the North American Numbering Plan Administrator determined the 650 area code would run out of numbers in third quarter 2001 and that another area code would be necessary to provide numbers to the area.

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 22, 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 either the new or the old area code 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 decision required all telephone corporations to implement permissive 1 + 10-digit dialing on September 18, 1999, and mandatory 1 + 10-digit dialing on June 17, 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 and ten-digit dialing in September. In December of 1999, by Decision 99-12-051, the CPUC suspended all overlays previously approved, which included the overlay in the 650 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 650 area code. This report fulfills that requirement.<sup>8</sup>

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<sup>8</sup> 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 650 area code.

## **1. Monthly Lottery Allocates Prefixes**

For those area codes nearing number exhaust, the CPUC has instituted a lottery process to fairly allocate the remaining prefixes among phone companies when demand exceeds supply. The 650 lottery began in September 1998. Currently, the CPUC distributes five prefixes (three initial and two growth<sup>9</sup>) in the monthly 650 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. Sixty-seven prefixes have been allocated in the 650 area code through this process between January 1, 2000 and December 31, 2000. Twenty-seven prefixes have been returned and reclaimed in calendar year 2000.

## **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 establishing number pooling trials, fill rates, and sequential numbering.

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<sup>9</sup> 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.

## 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. In addition, the CPUC has ordered pooling trials for ten other area codes during 2001.

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.<sup>10</sup> 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 650 area code is located in the San Francisco and San Jose Metropolitan Statistical Areas.<sup>11</sup>

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.<sup>12</sup> Thus, at this time, only wireline carriers<sup>13</sup> can participate in number pooling. In the area codes with number pooling, wireline carriers participate in pooling and wireless carriers participate in the lottery. In the remaining area codes in rationing, all phone companies participate in the lottery.

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<sup>10</sup> See Chapter Three of this report for a discussion of LNP.

<sup>11</sup> FCC's Opinion and Order on Telephone Number Portability FCC 97-74, issued March 6, 1997

<sup>12</sup> Cellular companies, PCS companies, and paging companies comprise the wireless category.

<sup>13</sup> ILECs and CLECs

The CPUC has been aggressively setting up number pools. Trials in four area codes are up and running. In November 2000, the CPUC by an Assigned Commissioner's Ruling set a pooling trial for the 650 area code to begin in May 2001, later rescheduled for June, 2001. All LNP-capable companies with numbers in 650 will be required to donate 1,000-number blocks to the pooling administrator. Under the number-pooling program, all LNP-capable carriers will receive numbers in blocks of 1,000 in the 650 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. All non-LNP capable carriers will continue to receive numbers in blocks of 10,000 through the monthly lottery allocation process.

## **2. Improved Number Inventory Management**

While the pooling trials will improve 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 provide to NANPA 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 prefix 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, assigning numbers in 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 results. For example, since the CPUC extended the 75% fill rate and imminent exhaust rules to all area codes, including 650, CPUC staff has observed that the demand for growth prefixes in each month's lottery has declined. As of December 31, 2000, there were 157 prefixes available for lottery assignment in the 650 area code.

### **3. CPUC Efforts at Federal Level**

The FCC has exclusive jurisdiction over numbering in the United States. 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 (first NRO Order).<sup>14</sup> The first 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 of 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 first 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 thousand-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 first NRO Order, the FCC gave state commissions until September 1, 2000 to conform their thousand-block number pooling trials to the national framework. One requirement imposed in California 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

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<sup>14</sup> Report and Order and Further Notice of Proposed Rulemaking, CC Docket No. 99-200 FCC 00-104 (released March 31, 2000).

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.

On December 29, 2000, the FCC issued its Second Report and Order on Number Resource Optimization. In the second NRO Order, the FCC also ruled on California's Petition for Waiver, concluding that we may continue to use our utilization thresholds subject to parameters set in this order (when FCC thresholds exceed California's, we must migrate to the more stringent utilization thresholds). The FCC also declined to adopt a transition period between the time that covered CMRS carriers must implement LNP and the time they must participate in any mandatory number pooling.

The first NRO Order 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 first NRO Order, 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 authority to create service-specific or technology-specific area codes. In the 650 area code, wireless

carriers hold 90 prefixes. If the CPUC were allowed to create a separate area code for those companies, these 90 prefixes in the 650 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. In the Second Report and Order, the FCC asks for further comments on technology specific or non-geographic area codes.

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 650 area code to undergo another area code change, the CPUC recognized the necessity of determining the number of telephone numbers that are in use and the number yet to be used. To that end, the CPUC instituted a utilization study of the 650 area code and required companies to provide usage data to the CPUC as of April 30,

2000. The TD contracted with NeuStar to collect the data; NeuStar submitted the aggregated data in its entirety to TD on August 18, 2000.

## **II. CHAPTER TWO: 5.0 MILLION UNUSED NUMBERS IN THE 650 AREA CODE**

Of the 7.6 million numbers in the 650 area code, companies hold 5.9 million. The other 1.8 million numbers have yet to be assigned to companies. The CPUC's utilization study found that of the 5.9 million numbers held by companies, 3.2 million remain unused in their inventories. Therefore, 5.0 million numbers in the 650 area code remain unused. A portion of these unused numbers can be made available for use by all companies, through the monthly lottery allocation process. In addition, companies have reported 2.6 million numbers as unavailable. A portion of these unavailable numbers can be used more efficiently if the recommendations contained in this report are implemented.

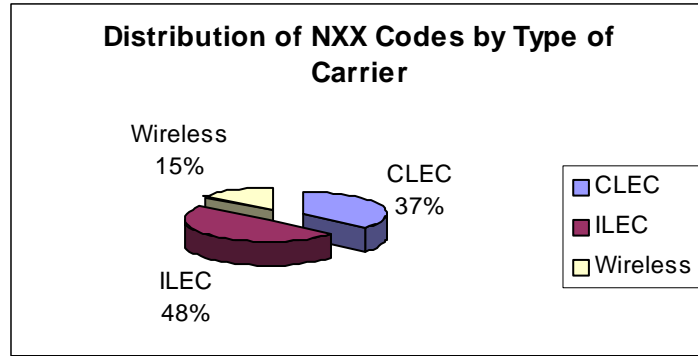
### **A. The Scope of the Utilization Study**

#### **1. Distribution Statistics of Prefixes**

The CPUC asked thirty-eight companies, holding 586 prefixes in the 650 area code, to report their utilization data with a reporting cut-off date of April 30, 2000. Table 2-1 shows the distribution of prefixes held in 650 by incumbent local exchange carriers (ILECs), competitive local exchange carriers (CLECs),<sup>15</sup> and wireless carriers in 13 rate centers.

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<sup>15</sup> Wireline carriers are composed of ILECs and CLECs.



## 2. Carriers Reporting

Of the 38 companies in the 650 area code, all companies submitted utilization data. A list of the companies that have been allocated numbers in the 650 area code appears in Appendix A.

## 3. Non-Reporting Companies

There were no non-reporting companies.

### B. Numbers Available in the 650 Area Code

#### 1. 5.0 Million Numbers Available

The 650 area code has 5.0 million unused numbers. Of these unused numbers, TD found that companies held 3.2 million numbers in their inventories.<sup>16</sup> These numbers held in inventory are currently not used but held in anticipation of future need. The remaining 1.8 million unused numbers are not yet assigned to companies and are made available in the monthly lottery. The breakdown of available numbers is shown in the table below.

<sup>16</sup> A detailed break-down of the available 3.2 million numbers is shown in Table B-1 in Appendix B.

Table 2-2  
Summary of Available Numbers

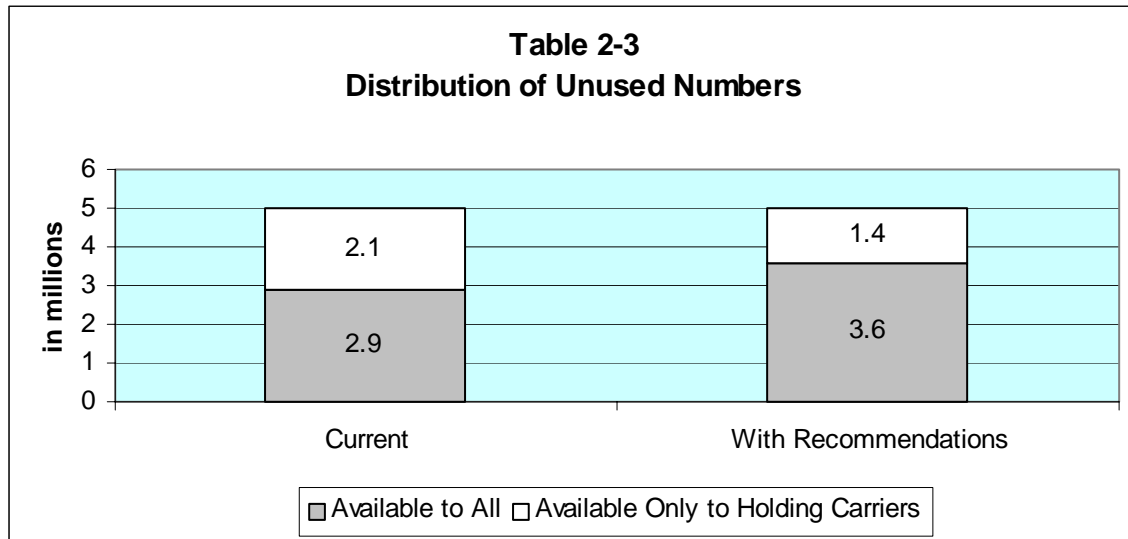
Wireline Carriers	2,659,057
Wireless Carriers	481,853
Type 1 Carriers	<u>81,341</u>
Total Available Numbers Reported by Carriers	3,222,251
Numbers Available for the 650 Lottery	<u>1,750,000</u>
Total Available Numbers in the 650 Area Code	4,972,251

Not all of the 5.0 million unused numbers are immediately available to every company that wants numbers. Of the 5.0 million numbers, only the 2.9 million numbers<sup>17</sup> are estimated to be available to all companies via the pooling trial or the lottery. The remaining 2.1 million unused numbers are only available to the companies who hold them. The 650 area code is currently not in a pooling trial although it is scheduled to begin on June 8, 2001. By setting up a pooling trial in the 650 area code and adopting recommendations in this report,<sup>18</sup> the CPUC could shift 0.7 unused numbers to the category available to all companies. Of the 5.0 million unused numbers, those actions could result in making a maximum of 3.6 million numbers<sup>19</sup> available to all companies with the remaining 1.4 million numbers available to the companies who hold them.

<sup>17</sup> 2.9 million numbers is comprised of 1,169,000 estimated pooling donations by companies, plus 1.75 million available through the lottery.

<sup>18</sup> Recommendations dealing with receiving authority from the FCC to increase contamination threshold rates (25%) for pooling, 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.

<sup>19</sup> See Table B-2 in the appendix for a detailed breakout of the 3.6 million numbers.



Current technology requires a company to be LNP-capable in order to donate numbers for another company to use. All wireline carriers in the 650 area code are required to be LNP-capable.<sup>20</sup> Although a number pooling trial has not started for the 650 area<sup>21</sup>, TD analyzed the 650 utilization data by percentage contamination to determine the availability of numbers that potentially can be used in a number pool. Wireline companies hold 2.7 million unused numbers in the 650 area code. In order for the unused numbers to be retrieved from company inventories, the FCC requires these unused numbers to be retrieved from blocks which are 10% or less contaminated.<sup>22</sup> Of the wireline companies' 2.7 million unused numbers 1.9 million are contained in 1,961 thousand-blocks held by LNP-capable carriers that are 10% or less contaminated. However, not all of these 1.9 million numbers can be retrieved from companies' inventories because companies need to have enough numbers to meet anticipated future need.<sup>23</sup> Both the CPUC

<sup>20</sup> Although all wireline carriers are required to be LNP-capable, four wireline carriers in the 650 area code remain non LNP-capable.

<sup>21</sup> Rulemaking 95-04-043: Pooling to start June 2001.

<sup>22</sup> 10% or less contaminated means that out of 1000 numbers in a block, 100 numbers or fewer have been classified as unavailable.

<sup>23</sup> Future need may include serving new customers or offering new services.



and the FCC have determined that six-months of inventory is a reasonable quantity to hold for future use.

The remaining 789,000 of the 2.7 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 720,000 numbers in blocks that are more than 10% contaminated.<sup>24</sup> Non-LNP capable carriers hold 70,000 of the 2.7 million unused numbers. Special use codes<sup>25</sup> are generally not LNP-capable and constitute 20,000 of the 1.9 million unused numbers.

Wireless carriers hold 482,000 unused numbers in the 650 area code. Of these unused numbers, 349,000 are in blocks that are 10% or less contaminated, while 133,000 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.

## **C. Analysis of Available Numbers**

### **1. Analysis of Wireline Carriers' Contamination Rates**

The CPUC requires each company participating in number pools to donate blocks that are 10% or less contaminated, excluding those retained for the six-month inventory.<sup>26</sup>

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<sup>24</sup> See Table B-1 in Appendix B. The 719,637 is comprised of 79,776 which are in blocks that are 10-15% contaminated, 81,141 from 15-20% contaminated, 55,290 from 20-25% contaminated, and 503,430 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 719,637 numbers available for number pooling.

<sup>25</sup> For a discussion of numbers held for special uses, see Section D.l.c of this chapter.

<sup>26</sup> INC's Thousand Block (NXX-X) Pooling Administration Guidelines, dated January 10, 2000, state that carriers should donate specified thousand blocks.

TD analyzed the 650 utilization data to determine the availability of numbers within blocks of different contamination levels to assess different contamination thresholds that could be employed in the number pool. The following table summarizes available numbers by contamination levels by rate center for wireline carriers.

Table 2-4

Wireline Available Numbers by Block Contamination Level					
Rate center	0%	>0% to 10%	>10% to 15%	>15% to 20%	>20% to 25%
HALFMOON BAY	50,000	21,313	1,797	2,404	799
LA HONDA	63,000	16,843	1,783	1,600	799
LOS ALTOS	68,000	32,272	6,202	3,247	2,378
MILLBRAE	78,000	48,654	7,107	4,000	3,144
MOSS BEACH	64,000	18,602	898	1,600	799
MOUNTAIN VIEW	140,000	62,083	6,253	7,362	8,671
OAKLAND MAIN PIEDMONT	0	0	0	0	0
PACIFICA	59,000	14,827	898	2,439	799
PALO ALTO	180,000	67,113	10,623	16,272	6,266
PESCADERO	71,000	18,522	1,769	1,600	1,549
REDWOOD CITY	102,000	64,549	9,650	5,721	7,945
SAN CARLOS BELMONT	105,000	49,317	6,192	5,707	5,541
SAN MATEO	113,000	65,548	10,610	17,829	8,667
SAN FRANCISCO CENTRAL	0	0	0	0	0
SAN FRANCISCO JUNIPER	51,000	24,907	2,612	2,459	799
SOUTH SAN FRANCISCO	96,000	59,466	11,585	7,301	4,753
WOODSIDE	49,000	16,642	1,797	1,600	2,381
650 NPA DA	0	0	0	0	0
<b>GRAND TOTALS</b>	<b>1,289,000</b>	<b>580,658</b>	<b>79,776</b>	<b>81,141</b>	<b>55,290</b>

The first two numeric 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. Table 2-4 shows that three rate centers have no 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 than 25% contaminated. Under the current number pool rules, companies retain thousand-blocks that are more than 10% contaminated. Increasing the contamination rate threshold from 10% to 25% would potentially free up an additional 216,000<sup>27</sup> 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, most rate centers have available numbers from blocks of differing contamination levels up to 25%. The tables show that if the contamination ceiling for pooling were increased from 10% to 25%, more unused numbers exist in most rate centers that potentially could 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.*

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<sup>27</sup> Additional numbers from the last three columns of Table 2-4: 79,776+81,141+55,290=216,207

## 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. Table 2-5 shows available numbers in blocks of differing contamination levels held by wireless carriers. Wireless carriers hold 349,000 available numbers in blocks that are 10% or less contaminated, as shown in the first two columns of Table 2-5. Wireless carriers also have 16,000 available numbers in blocks with contamination levels greater than 10% but less than or equal to 25% as indicated by the last three columns of Table 2-5. Of these 365,000 unused numbers held by wireless carriers, TD estimates that 119,000 (33%) are held by paging companies. TD staff is investigating whether there are methods to make some of these 119,000 unused numbers available to other carriers despite the FCC's exemption of paging companies from becoming LNP-capable.<sup>28</sup>

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<sup>28</sup> See Table B-2, Appendix B, for the derivation of this estimate.

Table 2-5

Wireless Available Numbers by Block Contamination Level					
Rate center	0	>0% to 10%	>10% to 15%	>15% to 20%	>20% to 25%
HALFMOON BAY	9,000	0	0	0	0
LOS ALTOS	18,000	999	0	0	0
MILLBRAE	12,000	4,974	0	846	0
MOSS BEACH	9,000	0	0	0	0
MOUNTAIN VIEW	30,000	6,867	894	817	785
PACIFICA	9,000	0	0	0	0
PALO ALTO	28,000	28,364	894	0	766
PESCADERO	9,000	0	0	0	0
REDWOOD CITY	45,000	11,720	0	0	762
SAN CARLOS BELMONT	17,000	1,995	0	0	0
SAN MATEO	35,000	22,441	1,732	3,328	2,278
SOUTH SAN FRANCISCO	27,000	14,782	1,738	0	1,543
WOODSIDE	9,000	0	0	0	0
GRAND TOTALS	257,000	92,142	5,258	4,991	6,134

Because the FCC has granted wireless carriers an extension of time to implement LNP, no wireless carriers serving the 650 area code are capable of implementing LNP. Thus, wireless carriers cannot participate in number pooling at this time, resulting in 365,000 unused numbers in blocks between 0% to 25% contaminated in the 650 area code.

**Recommendations from Block Contamination Analysis for Wireless**

- *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, as well as other methods of reducing the number of stranded numbers held by paging companies.*
- *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 under current rules. The CPUC's rules on sequential numbering and fill rate practices promulgated in Decision 00-07-052 are designed to prevent this problem from occurring. 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.*<sup>29</sup>

#### 4. Reclamation of Prefixes

Decision 00-07-052 directed companies to return prefixes that are held unused for more than six months. As shown in Appendix B-1, wireline carriers and wireless carriers hold 1,342,000 unused numbers and 257,000 unused numbers, respectively, in the 0% contaminated blocks. Of these 0% contaminated blocks, 340,000 numbers are in 34 whole prefixes, i.e. spare prefixes, while 1,259,000 numbers are 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

	<u>Avail. Nos. in 0% Contain Blocks</u>	<u>Avail. Nos. in Spare Prefixes</u>	<u>Avail. Nos. in Differing Prefixes</u>
Wireline Carriers	1,342,000	300,000	1,042,000
Wireless Carriers	<u>257,000</u>	<u>40,000</u>	<u>217,000</u>
Total	1,599,000	340,000	1,259,000

As shown above, 340,000 numbers in 34 prefixes can possibly be reclaimed if not used within six months. However, as a result of the FCC’s March 31, 2000 first 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 first NRO order. Substantial cooperation between the CPUC and the NANPA will be required in

<sup>29</sup> See Chapter 1 for the discussion on Decision 00-07-052.



order for the CPUC to exercise this new authority and 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.

NANPA has provided to the CPUC a list of companies which have failed to report whether their assigned prefix(es) have been placed in service. The CPUC issued Assigned Commissioner's Ruling Requiring Carriers to Comply With NXX Code Reclamation Rules, dated December 21, 2000. In this ruling, the CPUC instructed the delinquent companies to comply immediately. Companies are to inform the CPUC either that the prefix(es) have been placed in service or returned, that the company was incorrectly included in NANPA's delinquent list, or the reasons the prefix(es) have not been placed in service. The CPUC will review the reasons and make a determination on whether the prefix(es) must be returned or reclaimed by NANPA, or whether an extension of time is to be granted to the company to place the prefix(es) in service. Any delinquent companies that fails to comply will be subject to penalties and sanctions.

#### **D. Analysis of 2.6 Million "Unavailable" Numbers**

In the following sections, 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 2.6 million numbers in the 650 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 – Numbers from recently disconnected service which are not reassigned during a fixed interval.*

**1. 2.0 Million Assigned Numbers**

In the 650 area code, there are 2.0 million assigned numbers with 1.7 million assigned to customers by wireline carriers and 0.3 million assigned to customers by wireless carriers. The percentage of assigned numbers to total numbers held by companies is shown in the table below.

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Table 2-7

Assigned Numbers to Numbers Held by Carriers (in millions)

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	<u>Assigned Numbers</u>	<u>Nos. Held by Carriers</u>	<u>Percentage</u>
Wireline Carriers	1.7	5.0	34%
Wireless Carriers	.3	.9	38%

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***a. Non-Working Wireless***

Non-Working wireless describes numbers assigned to wireless customer equipment, but which are not yet working. These numbers are considered 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 10,000 assigned

numbers in the non-working wireless category for the 650 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 numbers to remain idle for an unspecified period.

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 180 days (similar to the requirement the FCC has established for reserved numbers). 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.

### **Recommendations for Treatment of Non-Working Wireless**

- *Non-working wireless numbers should be treated as reserved numbers and limited to 180 days, after which they should become 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 to 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 should 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<sup>30</sup>. 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 associated with each customer. LNP eliminates the need for two telephone numbers for each customer when the customer changes companies, because customers can take their numbers with them.

There are no Interim Number Portability reported in the 650 area code.

### **Recommendations for INP-Related Conservation Measures**

- *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 ILEC. These include numbers for recorded public information announcements such as time-of-day and weather forecasts, high-volume call-in numbers, and emergency preparedness<sup>31</sup> numbers. These prefixes are not made available for general commercial use, and thus numbers within these prefixes that are not in actual use lie vacant. In 1999, companies

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<sup>30</sup> Remote Call Forwarding allows a customer to have a local telephone number in a distant location. RCF 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.

<sup>31</sup> The emergency preparedness prefixes are for services other than 911.

decided not to duplicate the special use prefixes in each area code. Concerned that this process could adversely affect the public, the CPUC directed that these prefixes should be duplicated in each new area code.

The utilization study shows that four prefixes are dedicated for special uses: one each for directory assistance, high-volume calling, time, and emergency preparedness. TD questions the necessity of assigning an entire prefix for each purpose.

Furthermore, having multiple special use prefixes is an inefficient use of numbers in the 650 area code as well as in other area codes in California. For example, if the 555 prefix<sup>32</sup>, currently reserved only for directory assistance, could be used to provide time and emergency preparedness service, then two more prefixes could be returned for reallocation in the 650 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.

Consistent with our statewide conservation measures adopted in July, TD recommends that CPUC require companies to assign numbers sequentially within each 1,000 block.

### **Recommendations for Special-Use Prefixes**

- *TD recommends the CPUC initiate an investigation into the possibility of moving the numbers for time and emergency preparedness into the 555 prefix.*

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<sup>32</sup> 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 this use at the federal level.

- *TD recommends 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 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 thousand-block in order to free more blocks for number pooling.*

## **2. Reserved Numbers Are a Potential Source of Additional Numbers**

Carriers “set aside” numbers for future use by customers.<sup>33</sup> Previously, industry number assignment guidelines allowed companies to reserve a prefix for up to 18 months for customers’ future use.<sup>34</sup> The FCC’s first NRO Order modified the number reservation period to 45 days. This 650 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.<sup>35</sup> The extension allows companies time to upgrade their number tracking mechanisms, which tally the quantities of reserved numbers they hold. The FCC’s second NRO Order changed the number reservation period to 180 days. This took effect on December 29, 2000<sup>36</sup>. Companies reported a total of about 229,000 reserved numbers in the 650 utilization study.<sup>37</sup>

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<sup>33</sup> 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.

<sup>34</sup> Central Office Code (NXX) Assignment Guidelines, prepared by the Industry Numbering Committee, January 27, 1999 version, Section 4.4.

<sup>35</sup> FCC Order 00-280, CC Docket No. 99-200, adopted and released on July 31, 2000.

<sup>36</sup> See FCC Order 00-429, ¶ 114

<sup>37</sup> See Appendix D for a breakdown of reserved numbers reported in the 650 NPA by rate center.

Wireline carriers reported a total of about 219,000 reserved numbers in the 650 area code. If the quantity of reserved numbers held by wireline carriers can be minimized, additional numbers could be available for immediate use by the companies from within their own number inventories, thus slowing the rate at which new prefixes are allocated to these companies. Numbers could also be freed up for reallocation in the 650 number pool, once established.<sup>38</sup> Currently there are no limitations on the quantity or percentage of numbers a company can classify as reserved before requesting new numbers. Similarly, companies are not required to use their reserved numbers stock before they can request that new numbers be allocated to them. Comparing the data on the Mountain View rate center and the South San Francisco rate center illustrates wide discrepancies between the quantity of reserved numbers companies hold. Wireline carriers have almost twice as many reserved numbers in the latter rate center with fewer prefixes held.<sup>39</sup> In another example, one company holds over 6,000 reserved numbers in one prefix in the Los Altos rate center. Other companies in that same rate center hold as few as zero reserved numbers. If the CPUC orders efficient use practices specific to reserved numbers, more numbers could be made available for customer use.

Wireless carriers reported nearly 10,000 reserved numbers in the 650 area code. Wireless carriers also reported wide variances in reserved numbers. In the San Mateo rate center, many wireless carriers reported between 0 and 300 reserved numbers for a given rate center. By contrast, there were instances where almost 2,000 of 2,400 numbers in use were reserved in a given prefix. Just as for wireline carriers, efficient number use practices specific to reserved numbers could immediately free up numbers within wireless carriers' inventories for use,

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<sup>38</sup> A number pooling trial in the 650 area code is scheduled. Once the pool is implemented, carriers could donate excess numbering resources for reallocation and could get new number resources in smaller quantities (i.e. at the 1,000 number block level).

<sup>39</sup> Wireline carriers serving the Mountain View rate center reported 28,236 reserved numbers and wireline carriers serving the South San Francisco rate center reported 48,281 reserved numbers.

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 carriers.

### **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 180-day requirement.*
- *The CPUC should adopt efficient number use practices specific to companies reserved 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 numbers prior to requesting new numbers.*

### **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 reported over 41,000 administrative numbers in the 650 area code. Wireline carriers hold over 33,000 of these numbers and wireless carriers hold approximately 8,000 of them.

The utilization study revealed that there is a potential for companies to over-assign administrative numbers within a particular thousand-block, prefix or rate center in the 650 area code. The following examples demonstrate this potential for over-assignment. First, in the Palo Alto rate center, a company is using over 6900 numbers in one prefix for administrative purposes, while the average across all companies is 70 per prefix. Also, the La Honda rate center reports approximately five times as many administrative numbers compared to San Francisco Juniper, yet S.F. Juniper has 36 times the number of assigned numbers.



Given the variances in the levels of administrative numbers between companies and rate centers, 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. 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 blocks. This practice means that both wireline and wireless carriers will already have contaminated multiple thousand-blocks and prevents them from donating blocks once they can participate in number pooling, or from other LNP-based conservation measures.

Also, 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.

### **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 was only recently introduced by the FCC in its first NRO Order. This category tracks numbers that companies make available for use by another telecommunications carrier or non-carrier entity. Companies reported approximately 308,000 intermediate numbers in the 650 area code. Wireline carriers hold about 280,000 of those numbers and wireless carriers hold about 28,000. The quantity of intermediate numbers varied significantly among rate centers in the 650 area code.<sup>40</sup> 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. Therefore, TD recommends the CPUC continue to monitor intermediate number use.

##### **Recommendation 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 Type 1 carriers through Type 1 interconnection agreements.<sup>41</sup> Because wireline and wireless Type 1 carriers share responsibility for Type 1 numbers, both types of companies reported on these numbers. Wireline carriers report Type 1 numbers in the Intermediate category since they provide these numbers to another company. Wireline carriers also list the wireless companies to whom they distributed ranges of numbers. Wireless Type 1 carriers report on the numbers they received, placing

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<sup>40</sup> See Appendix F for a breakdown of intermediate numbers held by wireline and wireless carriers.

<sup>41</sup> Type 1 numbers are *programmed* in the wireline carrier’s end office, but are *used* by a wireless

them in the Assigned, Administrative, Reserved, Intermediate, Aging, or Available categories.

Record-keeping of Type 1 numbers is inadequate because, more often than not, wireline carriers' reports disagreed with wireless Type 1 carriers' reports. In the 650 area code, over 50% of all Type 1 numbers are unaccounted for or mismatched.<sup>42</sup> In some cases, wireless Type 1 carriers deny "owning" the numbers that wireline carriers report as distributed. In other cases, wireless Type 1 carriers go out of business and do not return their numbers to the wireline carrier. In either case, numbers are lying dormant, used neither by the wireline nor wireless Type 1 carrier.

In today's scarce numbering environment, it is unacceptable to let numbers go unused because of inadequate record-keeping. Wireline donor carriers currently do not monitor wireless Type 1 inventories, nor do they proactively reclaim unused Type 1 numbers from wireless carriers. TD recommends that wireline carriers perform an annual inventory check on Type 1 numbers to confirm that the numbers they have distributed are acknowledged by the recipient wireless Type 1 carrier. If errors are discovered, the wireline carriers should count the numbers as part of their own inventories.

Improved Type 1 number management is particularly crucial because, unlike numbers held by most wireless carriers, Type 1 numbers are eligible for number pooling.<sup>43</sup> Therefore, once unused Type 1 numbers are recovered by wireline carriers, these numbers could be made available for pooling. Despite the problems with reporting, TD has identified 9 blocks of Type 1 numbers in the 650 area code that may be eligible for donation to the pool.<sup>44</sup> The Commission should

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carrier.

<sup>42</sup> 143,600 out of a total of 275,600 Type 1 numbers are unaccounted for or mismatched.

<sup>43</sup> The 650 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.

<sup>44</sup> These blocks are 10% or less contaminated.

recognize Type 1 numbers as a resource for number pooling and take steps to have wireline companies recover unused Type 1 numbers for donation to the number pool.

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 administrator. TD recommends that Type 1 wireless carriers be subject to number conservation measures, and that the CPUC should develop a system to ensure compliance.

**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 verify their records match that of the wireless Type 1 carriers' records. Companies should make inventory data available to the CPUC upon request. Wireline companies should recover and add to their inventories any Type 1 numbers lying dormant.*
- *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 Type 1 numbers as potential donations to the number pool. Excess and unused Type 1 numbers should be returned to the wireline carriers and either used to serve customers or donated to the number pool.*

**5. Aging Numbers**

The FCC's first NRO Order defines aging numbers as disconnected numbers that are not available for assignment to another customer for a specified period of time. Consistent with the Industry Numbering Committee (INC) Guidelines, the CPUC adopted the FCC upper limits for aging numbers as 90 days for residential numbers and 365 days<sup>45</sup> for business numbers.

In the 650 area code, there are approximately 105,000 numbers in the aging category, representing 3.86 percent of the total unavailable numbers. While most companies track aging telephone numbers by business and residential categories, Pacific Bell, the largest single holder of numbers in the 650 area code, does not differentiate between business and residential customers when tracking aging numbers. In the cases where only totals were supplied, 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 Pacific is adhering to the maximum 90-day aging period for residential numbers, and whether at the end of the 90-day period Pacific is reassigning these numbers to the "available" category. 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 compared to the wireline category. Aging numbers represent 6.35 percent of the total unavailable wireless numbers, or about 27,000 numbers. Aging numbers represent 3.41 percent of the total unavailable wireline numbers, or about 78,000 numbers. This is consistent with the higher turnover or "churn" that occurs in the

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<sup>45</sup> 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 365 days for aging business numbers.

wireless industry. Table G-1 in Appendix G shows the breakdown of aging numbers by wireless and wireline categories.

**Recommendation for Aging Numbers**

- *Although the CPUC has required all companies to differentiate aging numbers between residential and business, and track the two categories separately, Pacific Bell has not complied with these requirements. Pacific Bell should be redirected to differentiate aging numbers between business and residential, track them separately, and report on each category accurately. The CPUC should assess penalties for failure to comply.*

**6. Need to Audit the Data**

The data analyzed in this 650 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 is efficiently managed. Second, audits will help verify whether companies are complying with CPUC and FCC rules for number usage.

**Recommendation for Audit**

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

### **III. 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 650 area code and statewide: LNP-related actions, Unassigned Number Porting, Rate Center Consolidation, and prefix sharing. 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, 415, 714 and 909 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 nine months. The pool has satisfied the numbering needs of all companies participating in the pool without opening a single prefix.<sup>46</sup> Prior to pooling, 128 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 18 months.<sup>47</sup>

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<sup>46</sup> Two prefixes have been opened in the 310 pool for LRN assignment purposes.

<sup>47</sup> As of December 18, 2000.

The positive experience in 310 is mirrored in 415, 714 and 909. Only two prefixes have been opened, and the numbering needs of companies have been met.<sup>48</sup> Pooling has saved 44 prefixes in these three area codes.

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.<sup>49</sup> With number pooling, new numbers can be activated in three weeks.

### **1. More Accurate Forecasting Will Improve Number Pooling**

So far in California, number pooling has worked well because companies have met their numbering needs from the excess 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 a true 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 been, on average, forecasting over *six 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

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<sup>48</sup> Three prefixes have been opened in the 415 pool for LRN assignment purposes

<sup>49</sup> Before a whole prefix is activated, the prefix must be first listed for 66 days in the Local Exchange Routing Guide (LERG), stating the rate center where the prefix will be located.



of the pool. However, they used only one. Had the pool administrator opened prefixes based on the forecast, the prefixes would lie unused in the rate center.<sup>50</sup>

The CPUC has thus far prevented prefixes from being unnecessarily opened by ordering the Pooling Administrator (PA) to consult with TD prior to opening any 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.<sup>51</sup> 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 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.*

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

Full LNP deployment in the 650 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.

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<sup>50</sup> Data can be found in Pooling Appendix.

<sup>51</sup> Sections 6.1.4 & 6.1.5 in INC 99-0127-023, January 10, 2000

In an order released in 1997, the FCC ordered all wireline carriers in the top 100 MSAs to become LNP capable by December 1998.<sup>52</sup> The 650 area code falls within two of the top 100 MSAs. The study revealed that all but two wireline carriers in the 650 area code are LNP capable. These companies hold 36,000 numbers that could be made available for number pooling, if they implemented LNP technology.<sup>53</sup> This non-compliance could likely be explained by the existence of subsequent FCC documents contradicting the original LNP order. However, in the Second Report and Order adopted December 7, 2000, the FCC resolved the confusion with a statement in footnote 399, “Specifically, we have mandated thousands-block number pooling in the top 100 MSAs where carriers are required to be LNP capable.”

Wireless carriers, however, requested and received from the FCC an extension of time, until November 2002, to become LNP capable.<sup>54</sup> The CPUC filed comments with the FCC arguing that wireless carriers should be required to participate in pooling immediately upon becoming LNP capable.<sup>55</sup> In the Second Report and Order, the FCC agreed with the CPUC and will require wireless carriers to participate in pooling immediately upon becoming LNP capable. Wireless non-LNP capable carriers hold 90 prefixes in the 650 area code, of which 351 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

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<sup>52</sup> FCC 96-286 in CC Docket No. 95-116.

<sup>53</sup> A third company lacks LNP capability in one switch in the 650 area code, although it is LNP capable in all other switches in the 650 area code. If this switch were LNP capable, an additional 1,000 numbers would be eligible for pooling.

<sup>54</sup> 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.

<sup>55</sup> 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.

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 request that non-LNP capable wireline carriers in the 650 area code become LNP capable.*

### **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 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 companies with smaller inventories to access the inventories of companies 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.<sup>56</sup> 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 company 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

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<sup>56</sup> See INC Contribution #336R of September 29, 2000, “UNP Architecture With Minimal Administrative Structure” and Focal and MCIWorldcom’s Report on UNP Trial

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.

The FCC has contemplated UNP but has so far declined to act.<sup>57</sup> The FCC has not ruled out UNP as a conservation measure.<sup>58</sup> In the absence of a voluntary company 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

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<sup>57</sup> First 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.”

<sup>58</sup> 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.”

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 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.<sup>59</sup>

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 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.”<sup>60</sup>

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.<sup>61</sup>

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<sup>59</sup> 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.

<sup>60</sup> “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.

<sup>61</sup> 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, I.87-11-033. The IRD phase took three years to complete.

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 this sharing arrangement promotes efficient number use among companies.

Some companies reporting utilization data in the 650 area code are affiliated through mergers, acquisitions or other business relationships. Despite these affiliations, each company separately requests numbers from the NANPA, or the pooling administrator if the area code is in number pooling. TD notes that the benefits of sharing prefixes may be different in area codes in which number pooling has already been implemented versus those in which 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.*

## CONCLUSION

Analyzing the utilization data provided by carriers has provided useful information regarding number availability and usage practices in the 650 area code. It also has offered insights into developing better public policies to improve efficiency of number use.

We now know that, of the approximately 7.6 million usable numbers in the 650 area code, approximately 5.0 million, or roughly two-thirds, presently are not in use. Despite the increasing demand for numbers, the 650 area code is not fully utilized. The data indicates that there is considerable room for growth within the existing 650 area code, and it is premature to consider splitting or overlaying the 650 area code at this time.

The CPUC already has directed carriers to employ measures to use the numbering resources in 650 more efficiently. Recently adopted fill rates and sequential numbering rules will ensure that carriers use their existing resources more fully and receive additional numbers only on an as-needed basis. The proposed number pooling trial to begin on June 8, 2001 will assure that all LNP-capable carriers are given numbers expeditiously and in usable blocks. Allocating numbers in thousand-block increments rather than in full prefixes of 10,000 numbers will ensure 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 deferral of LNP capability for wireless carriers, 2.1 million numbers are not in use in 650 but cannot be reassigned to other carriers. Changes in contamination thresholds and requiring



LNP capability for all carriers could make about 700,000 of 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 that 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-1

### 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.

## APPENDIX A-1 (continued)

**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

## APPENDIX A-1 (continued)

**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

## APPENDIX A-1 (continued)

**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.

**Table Prefix Holders in the 650 Area Code  
A-2**

1	<i>01 COMMUNICATIONS, INC.</i>
2	<i>ALLEGIANCE TELECOM, INC.-CA</i>
3	<i>AT&amp;T LOCAL</i>
4	<i>BAY AREA CELLULAR TELEPHONE</i>
5	<i>BROOKS FIBER COMMUNICATIONS - CALIFORNIA</i>
6	<i>COOK TELECOM, INC.</i>
7	<i>CRL NETWORK SERVICES, INC</i>
8	<i>FIRSTWORLD SO CA</i>
9	<i>FOCAL COMMUNICATIONS CORP OF CALIFORNIA</i>
10	<i>FRONTIER LOCAL SERVICES, INC.-CA DATA DUE 7/10/00</i>
11	<i>GST LIGHTWAVE, INC.-CALIFORNIA</i>
12	<i>GTE COMMUNICATIONS CORPORATION</i>
13	<i>GTE MOBILNET OF CALIFORNIA</i>
14	<i>ICG TELECOM GROUP - CA</i>
15	<i>LEVEL 3 COMMUNICATIONS, LLC-CA</i>
16	<i>MAP MOBILE COMMUNICATIONS, INC.</i>
17	<i>MCIMETRO, ATS, INC.</i>
18	<i>METROCALL</i>
19	<i>MGC COMMUNICATIONS, INC.-CA</i>
20	<i>NETWORK SERVICES LLC</i>
21	<i>NEXTEL COMMUNICATIONS</i>
22	<i>NEXTLINK OF CALIFORNIA</i>
23	<i>NORTH COUNTY COMMUNICATIONS CORP.-CA</i>
24	<i>OPTEL CALIFORNIA TELECOM, INC</i>
25	<i>PACIFIC BELL</i>
26	<i>PACIFIC BELL MOBILE SERVICES</i>
27	<i>PAC-WEST TELECOMM, INC.</i>
28	<i>PAGENET</i>
29	<i>PAGING PLUS</i>
30	<i>RCN TELECOM SERVICES INC</i>
31	<i>SAN DIEGO PAGING</i>
32	<i>SPRINT SPECTRUM L.P.</i>
33	<i>TELEPORT COMMUNICATIONS GROUP - SAN FRANCISCO</i>
34	<i>TELIGENT, INC.-CA</i>
35	<i>THE WESTLINK COMPANY</i>
36	<i>U.S. TELEPACIFIC CORP.-CA</i>
37	<i>WINSTAR WIRELESS, INC.-CA</i>
38	<i>WORLDCOM TECHNOLOGIES, INC.-CA</i>

Appendix B  
Table B-1  
5 million Available Numbers

	<b>Blocks</b>	<b>Numbers</b>
Wireline Carriers	4,960	2,659,057
Wireless Carriers	900	481,853
Type 1 Carriers		<u>81,341</u>
Subtotal	<u>5,860</u>	<u>3,222,251</u>
Set aside for number pooling	0	0
Available in lottery	<u>1,750</u>	<u>1,750,000</u>
Total	<u>7,610</u>	<u>4,972,251</u>

The 3.2 million available numbers assigned to carriers are broken down as:

Wireline Carriers

Blocks with 0% contamination	1,342	1,342,000
Blocks with more than 0% up to 10%	<u>619</u>	<u>597,420</u>
Subtotal: 0% to 10% contamination	1,961	1,939,420
Blocks with more than 10% up to 15%	90	79,776
Blocks with more than 15% up to 20%	100	81,141
Blocks with more than 20% up to 25%	70	55,290
Blocks with more than 25% contam.	<u>2,739</u>	<u>503,430</u>
Total	4,960	2,659,057

Wireless Carriers

Blocks with 0% contamination	257	257,000
Blocks with more than 0% up to 10%	<u>94</u>	<u>92,142</u>
Subtotal: 0% to 10% contamination	351	349,142
Blocks with more than 10% up to 15%	6	5,258
Blocks with more than 15% up to 20%	6	4,991
Blocks with more than 20% up to 25%	8	6,134
Blocks with more than 25% contam.	<u>529</u>	<u>116,328</u>
Total	900	481,853

Type 1 Carriers

Reported as Intermediate Numbers by Donors	275,600
Reported as Unavailable Numbers by Type 1 Carriers	(96,883)
Est. of Unavailable Numbers of Remaining Type 1 Carriers <sup>1</sup>	<u>(97,376)</u>
Total	81,341

1. Of the 275,600 numbers reported by donors as Type 1 numbers, Type 1 recipients only reported on 137,450 numbers: 96,883 unavailable and 40,567 available. Therefore, 138,150 numbers are unaccounted for. Staff estimated the unavailable numbers for the unaccounted numbers using the ratio from the numbers that were reported, namely 96,883 divided by 137,450.

Appendix B  
Table B-2  
Numbers Potentially Reallocable Among Carriers

<u>Available Outside of Pooling:</u>		Running Total	
1	From lottery	1,750,000	1,750,000
<u>Available for Pooling Under Current Rules:</u>			
2	Wireline Carriers: 10% or less contamination <sup>1</sup>	1,169,467	
3	Set aside for number pooling	0	
4	Subtotal -- Estimated Currently Poolable	1,169,467	
5	<u>Baseline reallocable numbers</u>		2,919,467
<u>Other Possibilities for Pooling:</u>			Increase from Baseline
6	Available Numbers from non-LNP blocks of wireline carriers	69,762	2,989,229
7	Available Numbers from Special Use Codes	0	2,989,229
8	Unavailable Numbers from Special Use Codes <sup>2</sup>	20,000	3,009,229
9	Wireline Carriers: Up to 15% contamination	79,776	3,089,005
10	Wireline Carriers: Up to 20%	81,141	3,170,146
11	Wireline Carriers: Up to 25%	55,290	3,225,436
12	Cellular & PCS Carriers: Up to 10% <sup>3</sup>	235,377	3,460,813
13	Cellular & PCS Carriers: Up to 15% <sup>3</sup>	3,545	3,464,358
14	Cellular & PCS Carriers: Up to 20% <sup>3</sup>	3,365	3,467,722
15	Cellular & PCS Carriers: Up to 25% <sup>3</sup>	4,135	3,471,858
16	Type 1 Carriers: Up to 10%	8,754	3,480,612
17	Type 1 Carriers: Up to 25%	4,082	3,484,694
18	Paging Carriers: Up to 10% <sup>3</sup>	113,765	3,598,459
19	Paging Carriers: Up to 15% <sup>3</sup>	1,713	3,600,172
20	Paging Carriers: Up to 20% <sup>3</sup>	1,626	3,601,799
21	Paging Carriers: Up to 25% <sup>3</sup>	1,999	3,603,797
21	Subtotal -- Additional Potentially Poolable Numbers	684,330	23.4%
23	Total -- Potentially Poolable Numbers	1,853,797	
24	Total Potentially Reallocable Numbers	3,603,797	

Notes:

- Actual numbers available to pool after carriers keep the allowed 6-month inventory were estimated from the 1,869,658 available numbers in LNP-capable, non-special-use blocks that are 10% or less contaminated, using the ratio of pooling donations to total 10% or less contaminated blocks (62.55%) from the 310 pool.
- See Chapter 2, Section E.1.c. for discussion of special use codes.
- While cellular and PCS carriers have until November 2002 to become LNP capable, paging companies are currently exempted indefinitely. Therefore, TD estimated the percentages of codes held by cellular and PCS (67%) vs. paging (33%), and applied the percentages to the total available wireless numbers.



Table B-3

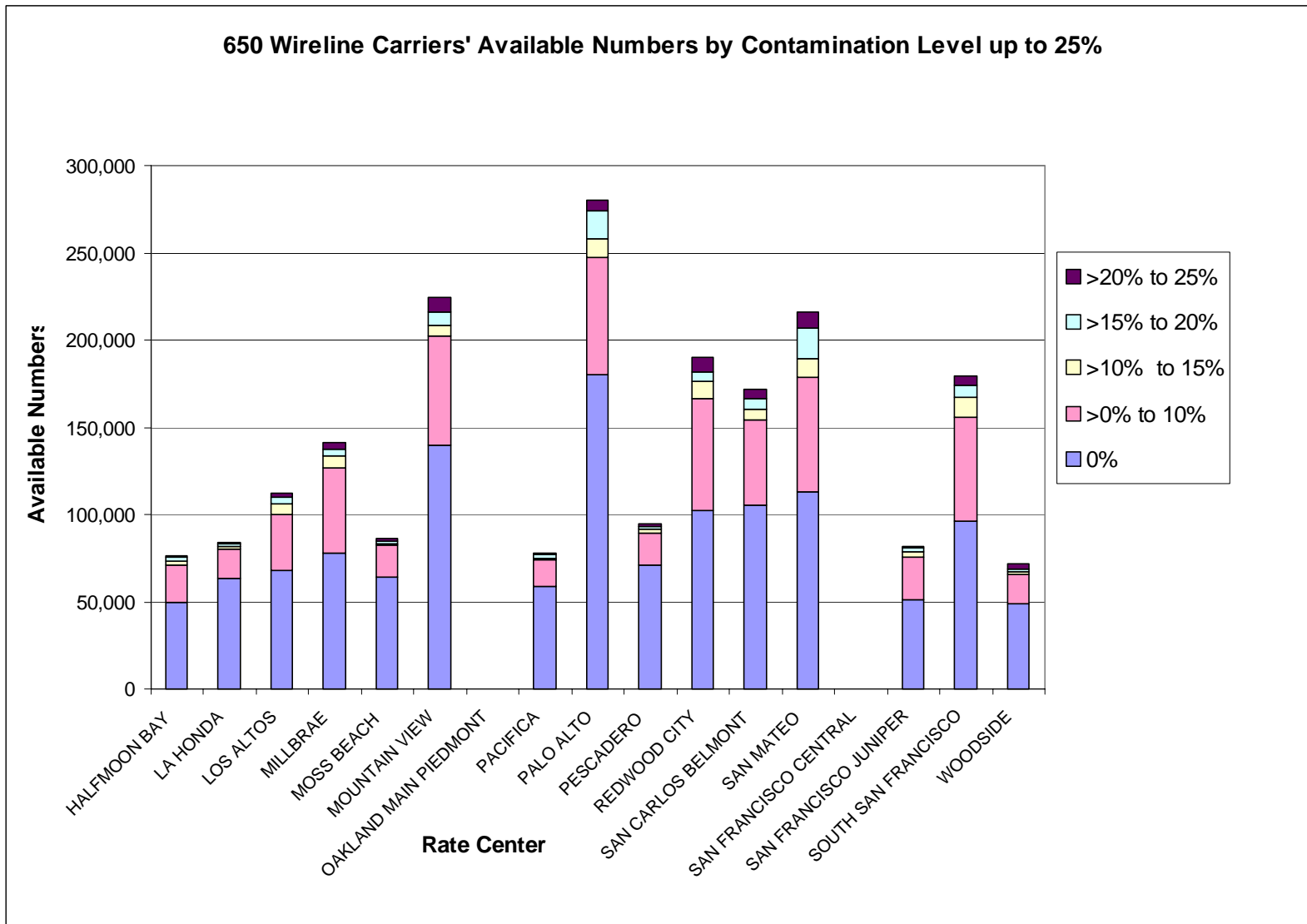


Table B-4

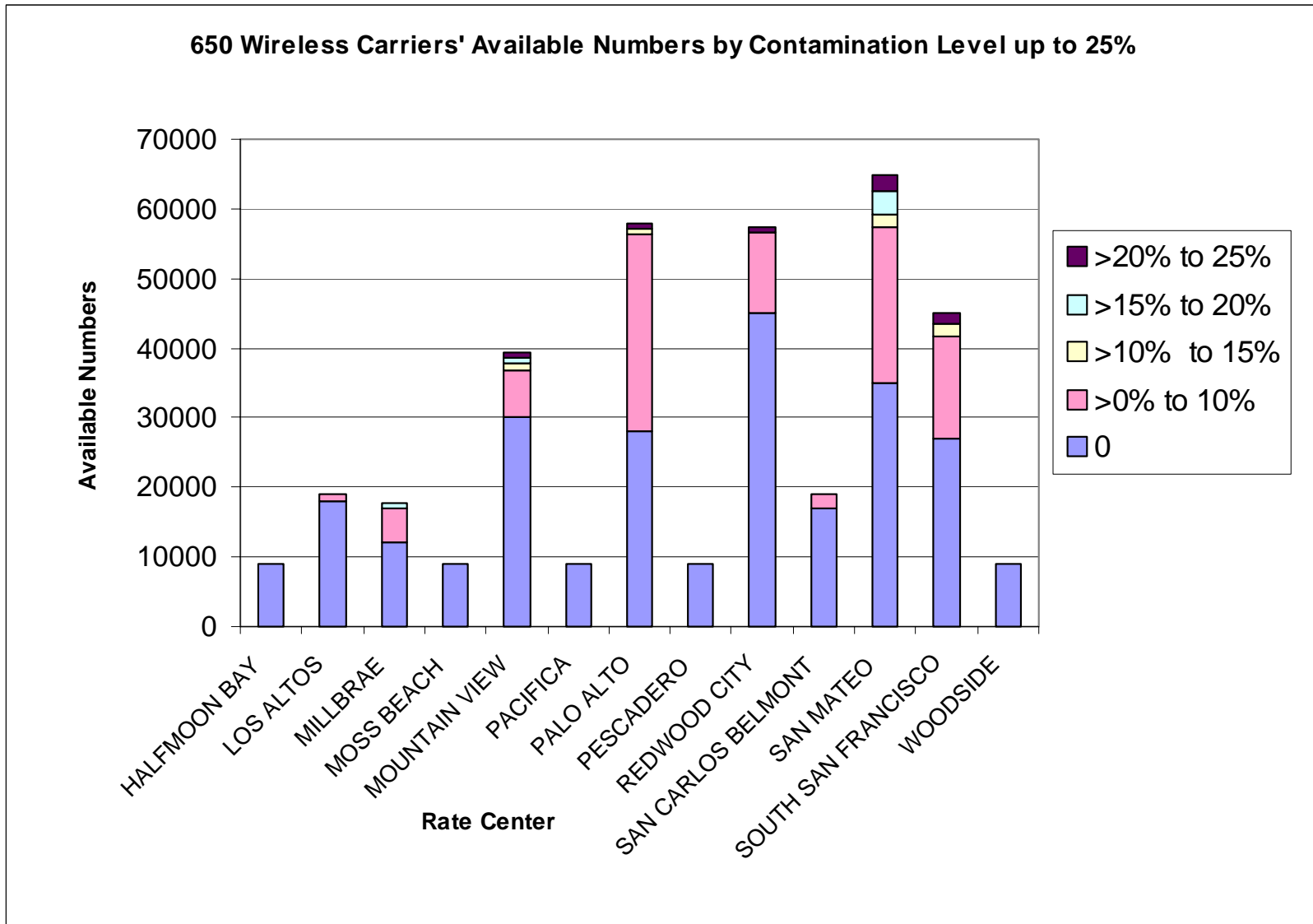


Table B-5

650 Numbers Assigned by Wireline and Wireless Carriers

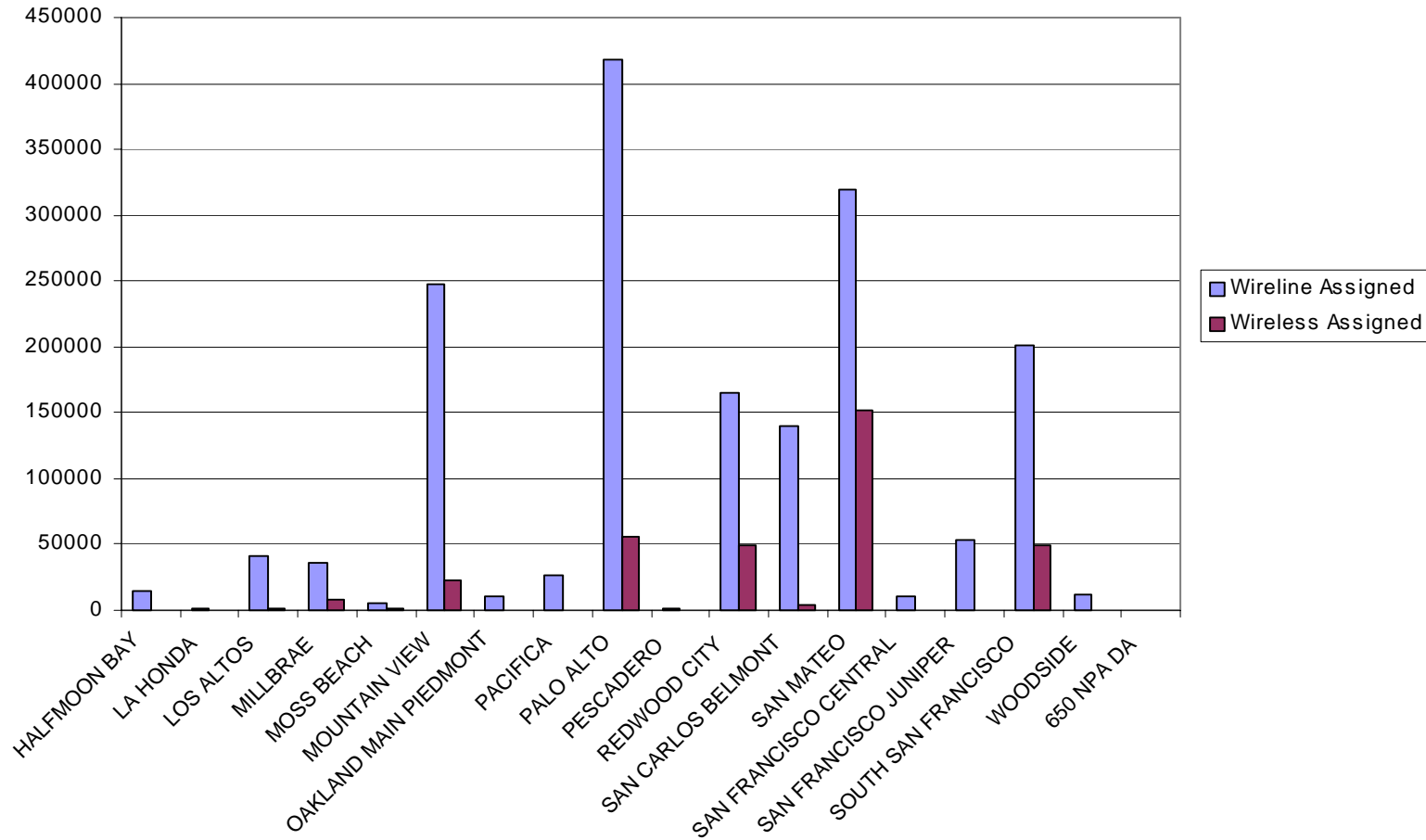


Table B-6

650 Numbers in Use vs. Total Numbers Held by Wireline Carriers

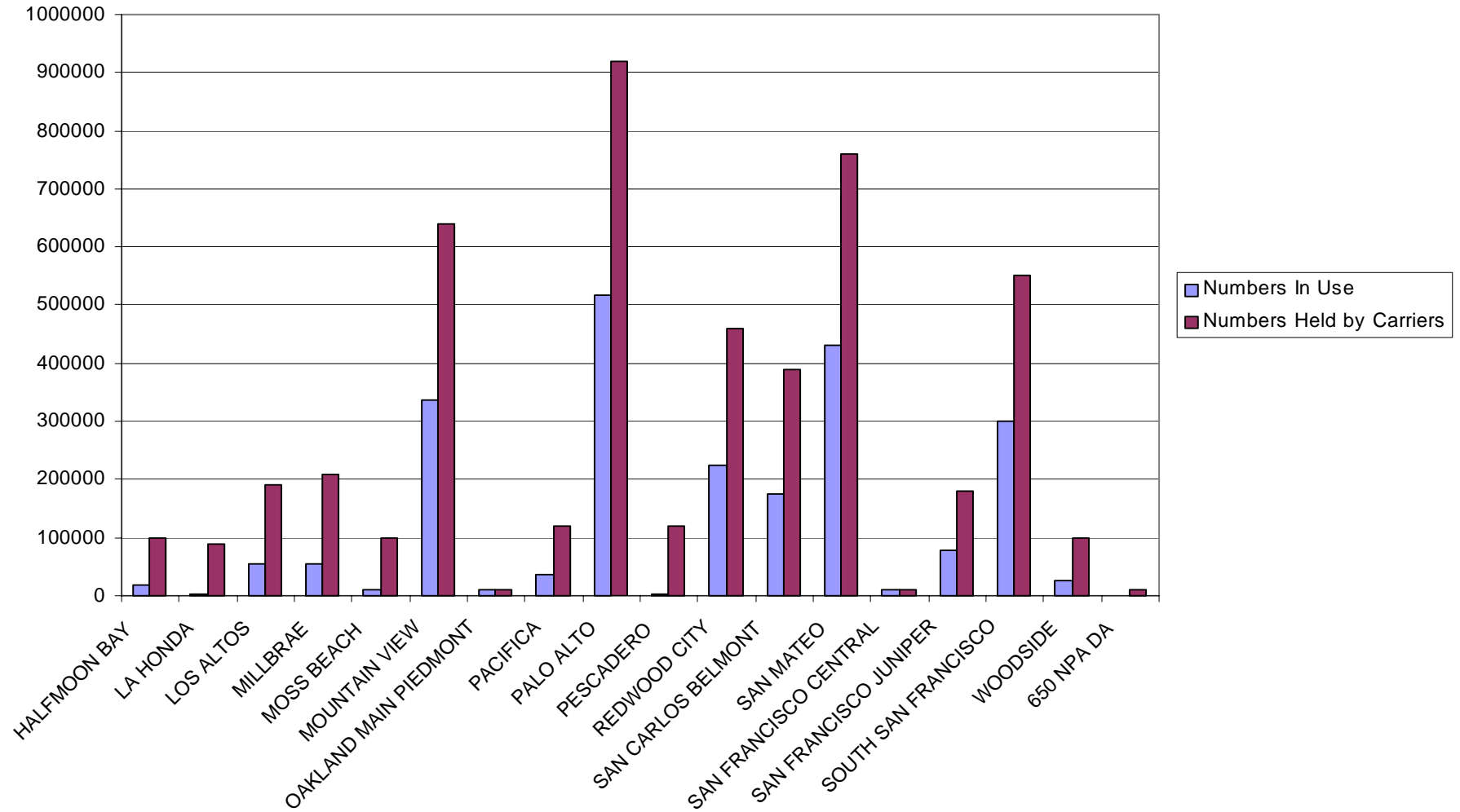
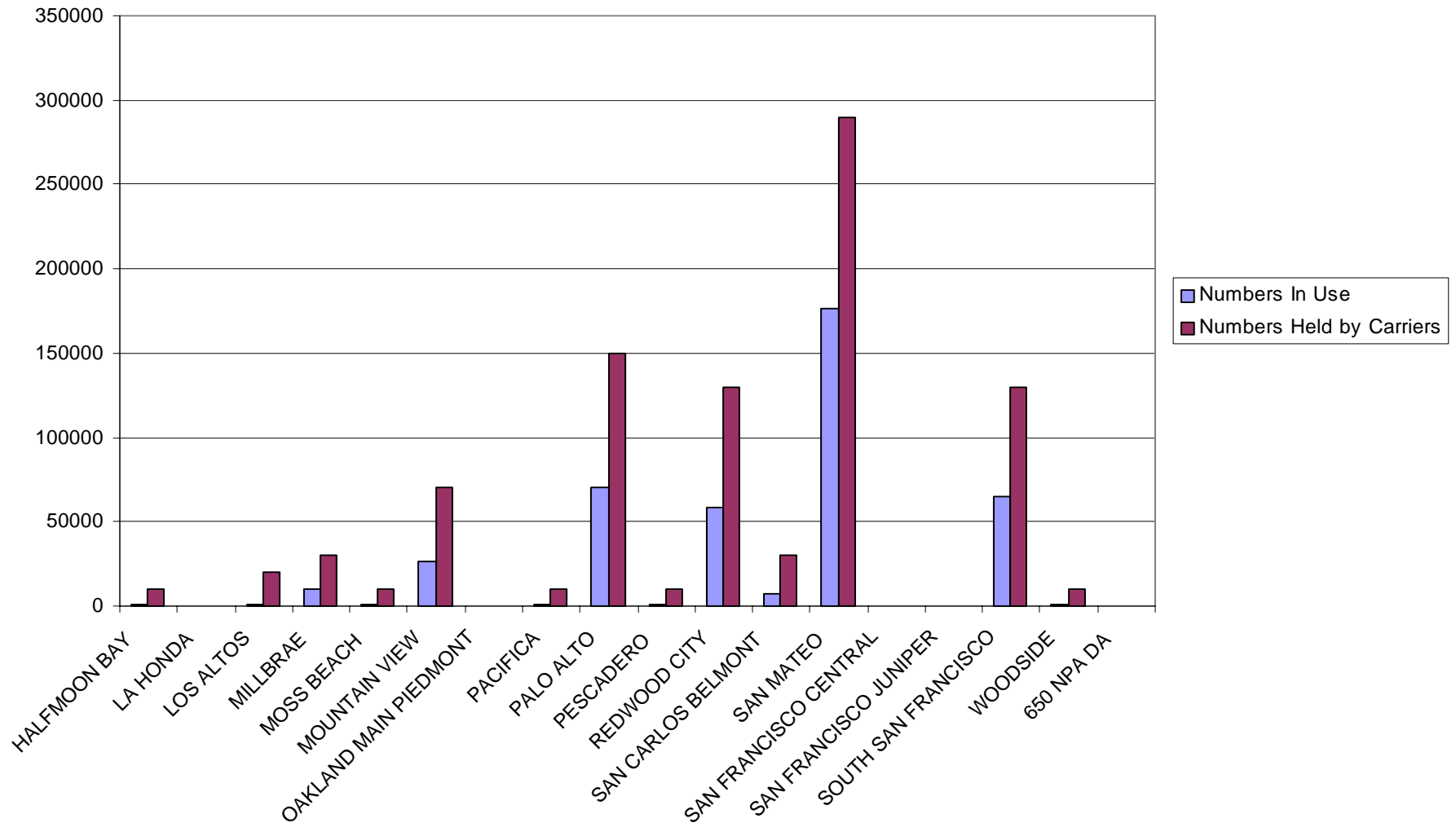


Table B-7

650 Numbers in Use vs. Total Held by Wireless Carriers



APPENDIX C

650 SPECIAL USE CODES

NXX	PURPOSE	ASSIGNED	UNAVAILABLE	AVAILABLE
478	High Volume Calling	10000	10000	0
555	Directory Assistance	10000	10000	0
767	Time Service	10000	10000	0
999	Emergency Preparedness Service	10000	10000	0

**Appendix D-1**  
**Wireline Reserved Numbers**

<b>Rate Center</b>	<b>Number of Wireline Carriers</b>	<b>Numbers Assigned to Wireline</b>	<b>Reserved Numbers</b>
HALFMOON BAY	8	14,978	1,279
LA HONDA	9	1,497	682
LOS ALTOS	13	40,924	9,764
MILLBRAE	15	36,476	11,507
MOSS BEACH	9	4,854	2,016
MOUNTAIN VIEW	20	247,010	28,236
OAKLAND MAIN PIEDMONT	1	10,000	0
PACIFICA	9	26,290	6,004
PALO ALTO	21	418,362	39,882
PESCADERO	12	1,988	16
REDWOOD CITY	18	164,877	12,736
SAN CARLOS BELMONT	19	139,837	13,287
SAN MATEO	22	319,690	34,430
SAN FRANCISCO CENTRAL	1	10,000	0
SAN FRANCISCO JUNIPER	5	53,634	3,060
SOUTH SAN FRANCISCO	20	200,523	48,281
WOODSIDE	9	12,038	7,628
<b>TOTALS</b>		<b>1,702,978</b>	<b>219,108</b>

**Appendix D-2**  
**Wireless Reserved Numbers**

<b>Rate Center</b>	<b>Number of Wireless Carriers</b>	<b>Numbers Assigned to Wireless</b>	<b>Reserved Numbers</b>
HALFMOON BAY	1	604	0
LA HONDA	0	0	0
LOS ALTOS	2	768	0
MILLBRAE	3	8,584	2
MOSS BEACH	1	703	0
MOUNTAIN VIEW	5	22,687	0
OAKLAND MAIN PIEDMONT	0	0	0
PACIFICA	1	642	0
PALO ALTO	9	56,575	2,718
PESCADERO	1	523	0
REDWOOD CITY	7	48,665	2,250
SAN CARLOS BELMONT	3	4,539	0
SAN MATEO	10	151,744	2,438
SAN FRANCISCO CENTRAL	0	0	0
SAN FRANCISCO JUNIPER	0	0	0
SOUTH SAN FRANCISCO	9	49,781	2,455
WOODSIDE	1	450	0
<b>TOTALS</b>		<b>346,265</b>	<b>9,863</b>



**Appendix E-  
Wireline Administrative Numbers**

<b>Rate Center</b>	<b>Number of Wireline Carriers</b>	<b>Numbers Assigned to Wireline</b>	<b>Employee/ Official Numbers</b>	<b>Test</b>	<b>Other</b>	<b>Total Admin Numbers</b>
HALFMOON BAY	8	14,978	602	643	2	1,247
LA HONDA	9	1,497	602	646	2	1,250
LOS ALTOS	13	40,924	505	854	9	1,368
MILLBRAE	15	36,476	1,106	1,226	401	2,733
MOSS BEACH	9	4,854	602	640	2	1,244
MOUNTAIN VIEW	20	247,010	688	1,566	204	2,458
OAKLAND MAIN PIEDMONT	1	10,000	0	0	0	0
PACIFICA	9	26,290	1,563	660	2	2,225
PALO ALTO	21	418,362	7,943	2,338	1,168	11,449
PESCADERO	12	1,988	602	631	7	1,240
REDWOOD CITY	18	164,877	1,121	1,643	228	2,992
SAN CARLOS BELMONT	19	139,837	618	2,054	257	2,415
SAN MATEO	22	319,690	1,335	1,997	254	3,586
SAN FRANCISCO CENTRAL	1	10,000	0	0	0	0
SAN FRANCISCO JUNIPER	5	53,634	1	234	0	235
SOUTH SAN FRANCISCO	20	200,523	828	1,878	256	2,962
WOODSIDE	9	12,038	4,401	643	5	5,049
<b>TOTALS</b>		<b>1,702,978</b>	<b>22,517</b>	<b>17,653</b>	<b>2,797</b>	<b>33,453</b>

**Appendix E-  
Wireless Administrative Numbers**

<b>Rate Center</b>	<b>Number of Wireless Carriers</b>	<b>Numbers Assigned to Wireless</b>	<b>Employee/ Official Numbers</b>	<b>Test</b>	<b>Other</b>	<b>Total Admin Numbers</b>
HALFMOON BAY	1	604	55	4	0	59
LA HONDA	0	0	0	0	0	0
LOS ALTOS	2	768	60	5	0	65
MILLBRAE	3	8,584	145	6	229	380
MOSS BEACH	1	703	60	4	0	64
MOUNTAIN VIEW	5	22,687	61	5	0	66
OAKLAND MAIN PIEDMONT	0	0	0	0	0	0
PACIFICA	1	642	45	4	0	49
PALO ALTO	9	56,575	553	1,118	1,195	2,866
PESCADERO	1	523	40	4	0	44
REDWOOD CITY	7	48,665	63	58	0	121
SAN CARLOS BELMONT	3	4,539	55	4	0	59
SAN MATEO	10	151,744	656	950	1,374	2,980
SAN FRANCISCO CENTRAL	0	0	0	0	0	0
SAN FRANCISCO JUNIPER	0	0	0	0	0	0
SOUTH SAN FRANCISCO	9	49,781	256	283	458	997
WOODSIDE	1	450	50	4	0	54
<b>TOTALS</b>		346,265	2,099	2,449	3,256	7,804

**Appendix F**  
**Wireline Intermediate Numbers**

<b>Rate Center</b>	<b>Number of Wireline Carriers</b>	<b>Numbers Assigned to Wireline</b>	<b>Intermediate Numbers</b>
HALFMOON BAY	8	14,978	0
LA HONDA	9	1,497	0
LOS ALTOS	13	40,924	1
MILLBRAE	15	36,476	300
MOSS BEACH	9	4,854	3,378
MOUNTAIN VIEW	20	247,010	48,200
OAKLAND MAIN PIEDMONT	1	10,000	0
PACIFICA	9	26,290	0
PALO ALTO	21	418,362	31,455
PESCADERO	12	1,988	0
REDWOOD CITY	18	164,877	36,300
SAN CARLOS BELMONT	19	139,837	14,000
SAN MATEO	22	319,690	57,819
SAN FRANCISCO CENTRAL	1	10,000	0
SAN FRANCISCO JUNIPER	5	53,634	18,600
SOUTH SAN FRANCISCO	20	200,523	38,700
WOODSIDE	9	12,038	0
<b>TOTALS</b>		<b>1,702,978</b>	<b>279,753</b>

**Appendix F**  
**Wireless Intermediate Numbers**

<b>Rate Center</b>	<b>Number of Wireless Carriers</b>	<b>Numbers Assigned to Wireless</b>	<b>Intermediate Numbers</b>
HALFMOON BAY	1	604	0
LA HONDA	0	0	0
LOS ALTOS	2	768	0
MILLBRAE	3	8,584	871
MOSS BEACH	1	703	0
MOUNTAIN VIEW	5	22,687	501
OAKLAND MAIN PIEDMONT	0	0	0
PACIFICA	1	642	0
PALO ALTO	9	56,575	4,419
PESCADERO	1	523	0
REDWOOD CITY	7	48,665	1,809
SAN CARLOS BELMONT	3	4,539	2,855
SAN MATEO	10	151,744	10,473
SAN FRANCISCO CENTRAL	0	0	0
SAN FRANCISCO JUNIPER	0	0	0
SOUTH SAN FRANCISCO	9	49,781	7,041
WOODSIDE	1	450	0
<b>TOTALS</b>		<b>346,265</b>	<b>27,969</b>

**APPENDIX G**

TABLE G-1			
AGING NUMBERS IN THE 650 area code			
	RESIDENTIAL	BUSINESS	TOTAL
WIRELINE	18	77,929	77,947
WIRELESS	12,008	14,536	26,544
TOTAL NUMBERS	12,026	92,465	104,491

## APPENDIX H

### NUMBER POOLING

#### 415 Pooling Updates (as of October 1, 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	4	6	4	35
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	4	6	4	64
SAUSALITO	5	0	5	0	37
SNFC CNTRL	75	1	75	1	109
SNFC JUNIPER	16	5	16	5	72
SNFC MT-EV	21	3	21	3	69
STNSN-BLNS	3	0	3	0	31
<b>TOTAL</b>	<b>164</b>	<b>30</b>	<b>164</b>	<b>30</b>	<b>619</b>

One Block = 1 thousand numbers

**APPENDIX H (cont.)**

Pooling Updates (as of December 12, 2000)											
	2000 Q1		2000 Q2		2000 Q3		2000 Q4		Year-to-Date		
NPA	Blocks Forecast by Carriers	Blocks Assigned by Pooling Administrator	Blocks Forecast by Carriers	Blocks Assigned by Pooling Administrator	Blocks Forecast by Carriers	Blocks Assigned by Pooling Administrator	Blocks Forecast by Carriers	Blocks Assigned by Pooling Administrator	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
310 (pool began 3/18)	225	73	199	29	286	26	198	32	908	160	653
415 (pool began 7/29)					164	30	193	8	357	38	623
714 (pool began 9/29)							224	34	224	34	633
909 (pool began 12/1)							143	19	143	19	996
<b>TOTAL</b>									<b>1632</b>	<b>251</b>	

One Block = 1 thousand numbers

# **APPENDIX I**

## **SUMMARY OF RECOMMENDATIONS**

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

### **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.*

### **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, as well as other methods of reducing the number of stranded numbers held by paging companies.*
- *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.<sup>62</sup>*

### **Recommendations For Treatment of Non-Working Wireless**

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<sup>62</sup> See Chapter 1 for the discussion on Decision 00-07-052.



- *Non-Working wireless numbers should be treated as reserved numbers and limited to 180 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 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 numbers for time and emergency preparedness into the 555 prefix.*
- *TD recommends that 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 CPUC require companies to assign numbers sequentially in special use prefixes. Where the numbers are presently assigned randomly, TD recommends that these are to be moved in special use prefixes and consolidated in one thousand-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 180-day requirement.*
- *The CPUC should adopt efficient number use practices specific to companies' reserved 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 numbers prior to requesting new numbers.*

#### **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 interviewing 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 verify their records match that of the wireless Type 1 carriers' records. Companies should make inventory data available to the CPUC upon request. Wireline companies should recover and add to their inventories any Type 1 numbers lying dormant.*
- *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 Type 1 numbers as potential donations to the number pool. Excess and unused Type 1 numbers should be returned to the wireline carriers and either used to serve customers or 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 not complied 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 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.*

### **Recommendations for LNP**

- *The CPUC should request that non-LNP capable wireline carriers in the 650 area code 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.*