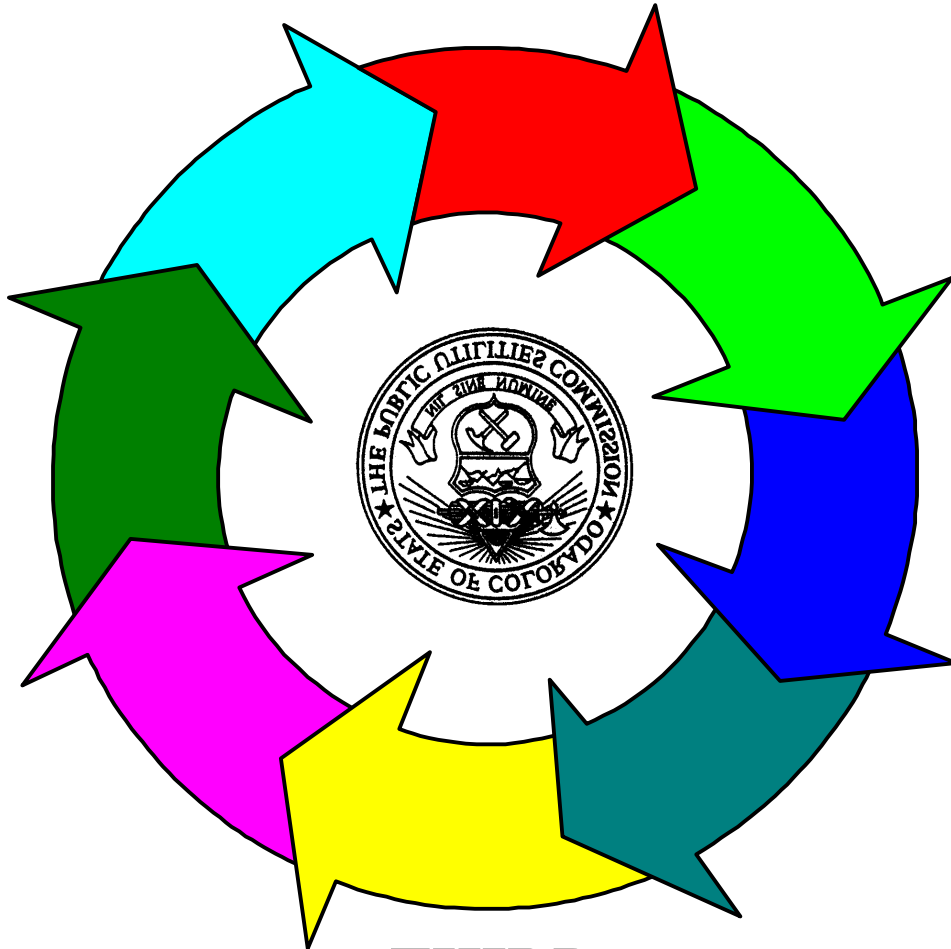


**COLORADO TELEPHONE NUMBERING
TASK FORCE**



**THIRD
REPORT TO THE
COLORADO PUBLIC UTILITIES
COMMISSION
STATEWIDE POOLING**

December 31, 1998

1.0 Introduction

The Colorado Numbering Task Force was established pursuant to Commission Decision No. C97-761 in Docket No. 97M-329T to provide solutions to a more efficient management of telephone numbers in the state. The Task Force has been given the objective of providing the Commission with a recommended solution to the long-term efficient use of telephone numbers within the area codes in Colorado; an objective timeline for the implementation of this long-term solution; and recommendations for interim conservation measures consistent with the long-term solution. The Task Force has submitted two previous reports to the Commission on October 30, 1997 and January 30, 1998. The previous reports focused on near term solutions to number conservation whereas this report focuses on long term solutions.

The Colorado Numbering Task Force is made up of industry and regulatory personnel whose responsibility or focus within their organizations is involvement with numbering plan issues on either a local, regional or national basis. The task force is chaired by Bruce Armstrong of the Colorado PUC. Members include all disciplines within the telecommunications industry: Incumbent Local Exchange Carriers (ILECs), Competitive Local Exchange Carriers (CLECs), paging service providers, cellular and PCS providers, interexchange carriers, and the Colorado Office of Consumer Counsel. There is also participation by Lockheed-Martin IMS (the designated North American Numbering Plan Administrator (NANPA)) and GTE Telecommunications. Many of the Task Force members are also participants in national committees, other state committees or task forces relating to numbering issues.

The Telecommunications Act of 1996 (Act) addresses numbering issues in a competitive local telecommunications market. The Act requires nondiscriminatory access to telephone numbers for all competing providers of telephone exchange service and telephone toll service.¹ The Act also requires the Federal Communications Commission (FCC) to ". . . create or designate one or more impartial entities to administer telecommunications numbering and to make such numbers available on an equitable basis."² In October, 1997, acting on a recommendation made by the North American Numbering Council (NANC), the FCC selected Lockheed Martin IMS as the North American Numbering Plan Administrator (NANPA) for a five year period.

Since the Act was signed into law, a large effort has been devoted to numbering issues. This is primarily because there has been increased demand on the numbering resource. This increased demand has resulted in the exhaustion of numerous Numbering Plan Areas (NPAs or area codes). When negative consumer reaction to NPA exhaust situations reaches a state commission, the focus of the state commission has typically been on conservation issues to eliminate the need for more disruptive NPA splits or overlays

¹ See 47 U.S.C. § 251 (b)(3). The FCC further defined this requirement in its Second Report and Order and Memorandum Opinion and Order FCC 96-333 in CC Docket No. 96-98, dated August 8, 1996 at paragraph 101. The FCC defines "competing provider" refers to a "provider of telephone exchange service or a provider of telephone toll service that seeks nondiscriminatory access from a providing LEC." "Such providers may include, for example, other LECs, small business entities entering the market as resellers, or CMRS providers."

² See 47 U.S.C. § 251 (e)(1).

rather than long term solutions to competitively neutral number administration. Countless hours have been spent in national and state task forces working on the implementation details of numbering issues, sometimes without much visible success. The FCC has not so far promulgated rules that provide a long term goal for number administration.

In order to accomplish what the Act envisions with respect to the competitive neutrality and equity of numbering administration, it is necessary to agree on a long term goal and then develop interim targets to get to that goal. The Colorado Numbering Task Force agrees that all telephone numbers³ should be administered by an independent third party whereby all numbers are available on a real-time, competitively neutral basis to all entities.

However, it is also the opinion of the Colorado Numbering Task Force that this long-term goal probably cannot be accomplished immediately in a single step. We believe that it will likely take no less than five years⁴ to fully accomplish this long-term goal through a series of interim steps after a decision is made to do so by the industry, the FCC, state regulators, or all three. Also, the Colorado Numbering Task Force recognizes that the FCC and the states are acting on various near term solutions (*e.g.*, rate center consolidation, number pooling, etc.) and does not wish to repeat what is already being done by other states or the FCC. Therefore, we are presenting a study of the feasibility of implementing number pooling on a statewide basis in Colorado. Current number pooling efforts are only considering the pooling of numbers within a rate center. This report addresses the feasibility of expanding pooling to multiple rate centers and ultimately the entire state.

Number pooling is being seriously considered at various state and national forums as a solution to the optimization of the numbering resource. The FCC, the NANC, the Numbering Resource Optimization Working Group (NRO), various committees and working groups under the Alliance for Telecommunications Industry Solutions (ATIS), and some states (*e.g.*, Illinois, New York, and Connecticut) are actively involved in developing guidelines for the implementation of number pooling. In each of these cases, number pooling is restricted to thousand block pooling within an incumbent local exchange company rate center wherein Local Number Portability (LNP) is deployed and the service provider (SP) is LNP capable.

The Colorado Numbering Task Force recommends that the Commission direct it to continue further evaluation of the feasibility of statewide number pooling in Colorado.

2.0 Purpose and Scope

This report:

³ It is understood by the Task Force that certain non-geographic telephone numbers (*e.g.*, numbers using the 800, 888, 911, etc. area codes) do not fall under the same parameters as geographic numbers. This statement is only addressing geographic numbers.

⁴ The five year estimate is not based on any empirical analysis and is not intended to provide anything more than an estimate based on the experience of some of the members of the Task Force. All or portions of some of these options may be implemented prior to the implementation of statewide number pooling.

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- ✓ Presents the recommendation;
 - ✓ Presents the alternatives considered;
 - ✓ Reviews the ongoing national industry activities/methodologies;
 - ✓ Justifies the recommendation;
 - ✓ Provides an estimated cost – benefit analysis; and
 - ✓ Presents a means to implement the recommendation.

This document provides a recommendation to the Commission by the Colorado Numbering Task Force to maximize the utilization of telephone numbers within the State of Colorado. This recommendation is based upon the experience of task force members within industry forums, current technological considerations and abilities, the capabilities and limitations of the telecommunications and operational support systems network within the State of Colorado, and a forward look at where regulatory requirements, industry perspectives, competition, reasonableness and market forces may drive the industry in the future.

Members of the task force have identified the various issues and problems associated with the recommendation as well as specific concerns within the State. This recommendation provides for the most efficient utilization of numbers within the State while meeting industry guidelines, standards, and objectives.

3.0 Background

The Federal Telecommunications Act of 1996⁵ gives the FCC authority to "create and designate one or more impartial entities to administer telecommunications numbering and to make such numbers available on an equitable basis." The Act also states that the FCC "shall have exclusive jurisdiction over those portions of the North American Numbering Plan that pertain to the United States." The Act also states that nothing shall preclude the FCC "from delegating to State commissions or other entities all or any portion of such jurisdiction."

Acting upon these federal statutory requirements, the FCC promulgated rules⁶ relating to numbering. In its rules the FCC retained its statutory authority in establishing the North American Numbering Plan Administrator (NANPA) to administer the North American Numbering Plan (NANP)⁷ and to administer central office codes.⁸ The FCC delegated to State commissions the resolution of matters involving the introduction of new area codes within their states.⁹ The FCC stated that such area code relief matters may include: "directing whether area code relief will take the form of geographic split, an overlay area code, or a boundary realignment; establishing new area code boundaries;

⁵ See 47 U.S.C. § 251(e)(1).

⁶ CC Docket No. 96-98, Second Report and Order and Memorandum Opinion and Order, FCC 96-333, Adopted August 8, 1996.

⁷ See 47 CFR § 52.13.

⁸ See 47 CFR § 52.15.

⁹ See 47 CFR § 52.19(a).

establishing necessary dates for the implementation of area code relief plans; and directing public education and notification efforts regarding area code changes."¹⁰ The FCC also states in its rules that, "State commissions may perform any and all functions related to initiation and development of area code relief plans, so long as they act consistently with the guidelines enumerated in [this section of the FCC rules]."¹¹

Prior to the federal Act, the Colorado General Assembly enacted legislation¹² to allow for some of the same goals for local competition that were placed into the federal Act. The Colorado legislation required among other things the Colorado Commission "to adopt rules governing, and establish methods of paying for . . . cost-based number portability and the competitively neutral administration of telephone numbering plans."¹³ The Colorado Commission adopted rules¹⁴ effective on April 30, 1996 that address the administration of telephone numbering plans, telephone number assignment, and a number portability database network architecture. The Colorado Commission's rules address some of the same issues addressed in the FCC rules relating to competitive neutrality and nondiscrimination.

In the current telephone numbering environment, there is a slightly tenuous cooperative effort being put forth between the telecommunications industry, state and federal regulators, and consumer groups to develop policy for the future. In this policy development arena (as described generally in the section of this report on national forum activity), the process is moving slowly from the perspective of some state regulators. As a result, state regulators are pursuing strategies or policies that are moving either ahead of, parallel to, or in apparent opposition to the developing national policies. Whenever states pursue policies contrary to the views of an industry player or players, the aggrieved party seeks correction by the FCC or the NANC or one of the national industry forums. To date, there has been no absolute bright line between federal and state authority on such parochial state issues, except when these decisions run contrary to federal statutes or rules.

When national guidelines are finally accepted and/or approved by the FCC, the current level of cooperation between state and federal regulators must continue for several reasons. First, national guidelines will be written in general enough terms that may require state-specific interpretation. Second, specific state conditions may dictate variances from general rules. Third, the FCC does not have the staff to deal with every state-specific situation that may arise. Fourth, state regulators should be equipped to understand and interpret national guidelines as they relate to state-specific conditions.

With regard to the jurisdictional issue relating to number administration, both Colorado state statutes and the federal Act explicitly require the nondiscriminatory provision of telephone numbering. Also, the Colorado Commission and the FCC have determined, based upon statutory authority, that telephone numbers are a public

¹⁰ *Ibid.*

¹¹ See 46 CFR § 52.19(b).

¹² H.B. 95-1335, enacted May 15, 1995.

¹³ See § 40-15-503 (2)(b)(II)m C.R.S.

¹⁴ See 4 CCR 723-34.

resource.¹⁵

4.0 Principles, Assumptions and Constraints

The following principles, assumptions, and constraints form the framework from which statewide number pooling can be implemented in Colorado in a fair and equitable manner that does not disadvantage any service provider in the provision of telephone numbers.

4.1 Principles

Statewide number pooling shall be implemented in accordance with the following principles. The recovery of costs associated with the development and implementation of number pooling, as well as the consideration of the initial and subsequent economic effects on all impacted entities are extremely important. Any solution should not preclude the development of appropriate cost recovery mechanisms. However, this report only provides general conclusions regarding such cost considerations.

4.1.1 Number Pooling Availability Principle

Using current technology under existing network architecture, number pooling can only be implemented in locations where permanent LNP using the Location Routing Number (LRN) architecture has been implemented, and only by entities which have implemented such LRN LNP. Technical limitations may require exemptions of certain types of switches from participating in number pooling. However, this should not disadvantage any industry segment to a degree greater than any other.

4.1.2 Reciprocity Principle

All carriers obtaining numbers from the pool shall be obligated to contribute their eligible numbers to the pool.

The introduction of statewide number pooling in Colorado should not disadvantage any industry segment to a degree greater than any other. Thus, carriers who are not obligated via Section 4.1.3 (Participation Principle) to participate in number pooling must have the opportunity to obtain usable numbering resources from the same NPA numbering resources as those carriers who participate in number pooling.

¹⁵ See *Commission Decision Adopting Rules*, Decision No. C98-278, dated March 17, 1998 in Docket No. 98R-034T at p.6; see also Report and Order, *In the Matter of Administration of the North American Numbering Plan*, 11 FCC Rcd 2588, 4 (1995); *Industry Numbering Committee NPA Code Relief Planning and Notification Guidelines*, INC 97-0404-016, 2.9 (April 4, 1997); *Industry Carriers Compatibility Forum, NPA Allocation Plan and Guidelines*, INC 96-0308-011, 2.8 (April 19, 1996).

4.1.3 Participation Principle

Service providers offering local number portability in accordance with the Telecommunications Act of 1996, and as ordered by the FCC Report and Order CC Docket No. 95-116, or other applicable state and/or federal mandate, shall also participate in number pooling where number pooling is implemented. Service providers offering local number portability are also encouraged to participate in number pooling development, deployment and associated administrative functions.

4.1.4 Non-participation Principle

Service providers should not be required to participate in number pooling before they have implemented local number portability using LRN. This does not preclude the implementation of alternative network architectures that are technically and economically feasible for the implementation of number pooling. Number pooling should not preclude such service providers from obtaining usable non-pooled geographic numbering resources.

4.1.5 Equal Availability Principle

Numbering resources in the industry inventory pool shall be equally available and allocated to service providers in a fair and non-discriminatory manner.

4.1.6 Architectural Flexibility Principle

The architecture selected for the support of number pooling must allow service providers reasonable flexibility for the manner in which they interface with the systems supporting number pooling.

4.1.7 Customer Transparency Principle

The mechanism by which pooling is provided must be transparent to the customer regardless of the number of times a customer changes service providers.

4.1.8 Technical Equity Principle

The technical characteristics of existing interconnection arrangements with participating and non-participating networks should not be fundamentally changed as a result of number pooling.

4.1.9 Network Reliability Principle

The pooling of numbers shall not degrade network reliability nor negatively impact network performance.

4.1.10 LNP Impact Principle

The implementation of any number pooling mechanism or methodology will not impact the functionality of, or schedule for, LNP as ordered by the FCC. In particular, schedules for LNP implementation should not be advanced in any way to support number pooling.

4.1.11 Uniform Interface Principle

The number pooling architecture selected shall support inter-operability such that service providers will interface with a number pool and obtain numbers for their use.

4.2 Assumptions

The Task Force developed the following general assumptions regarding the long-term goal of implementing statewide number pooling.

1. Competitively Neutral Pool Administrator – Numbering resources available to all and allocated in a fair and non-discriminatory manner.
2. Timely – Pooling will be implemented when the solution is available and technically feasible
3. Reliability – Of administration, of physical network layer, and logical network layer. Redundancy. Database capacities. Call rating.
4. Responsive – Meet customer demands, speed of transactions. Number assignment within X seconds. Database queries delivered within Y milliseconds. The Task Force makes no recommendations regarding the values of X and Y at this time.
5. Efficient – Cost, number administration, etc. Number pooling method is transparent to the Colorado end users.
6. Availability – The capability to obtain a number will be available on a 7 x 24 basis.
7. Standardized Interfaces – Between network elements. Between the Pooling Administration Center (PAC) and its members.
8. Measurable Performance – Auditing, reporting and accounting. Forecasting and replenishment.
9. Universal Participation – LRN-capable networks and non-LRN-capable networks.
10. End User E911 Transparency – Any changes to E911 system shall be transparent to the end user.
11. E911 Systems - E911 systems will likely require substantial upgrades or changes.
12. Process to Select Administrator – Use of previous processes. Use INC Report to NANC on Number Pooling.
13. Pooling Administrator Guidelines - Will be developed by national forums
14. Intellectual Property Rights – Portability of solution (independent of vendor)
15. Scalable – To state, LATA, NPA, or rate area.
16. Contract capability- Must be able to allow for the preliminary reservation of same blocks of numbers by multiple number users in contractual situation. The Task Force recommends a system where multiple providers reserve the same numbers at

the same time and the contract winner gets the numbers.

4.3 Constraints

- Statewide number pooling will not be implemented until a neutral number pool administrator is in place and able to perform the number administration function.
- Statewide number pooling will not be structured so as to preclude or require any particular industry segment's participation. Although there may be considerations unique to particular segments of the industry, number pooling must be available to all carriers who want to participate.
- Each number pooling area should be constrained to within the State of Colorado. This does not preclude a recommendation for statewide number pooling in Colorado that requires a step-by-step transition from pooling at a rate center, NPA, LATA, or other geographic or political boundary to arrive at statewide pooling.
- The current wireline call rating process needs to be changed by breaking the association between the NPA-NXX and call rating, in which call rating for wireline carriers is based upon the rate centers associated with the calling and called party. The Task Force feels that, for statewide number pooling to be implemented effectively, major modifications in the call rating process need to take place by breaking the association between NPA-NXX and call rating.
- The LRN LNP architecture currently envisioned for statewide number pooling assumes certain network capabilities of the participating carriers. Every effort should be made to implement statewide number pooling in such a manner so that number resources may be utilized efficiently while minimizing the required investments of all carriers. There has been no national industry or FCC direction with respect to the effort necessary to implement changes perceived for statewide number pooling.
- Implementation of number pooling will be subject to applicable local, state and federal regulatory requirements.

5.0 Alternative Solutions Considered

Several alternatives, variations, and related conservation measures were considered by the Task Force in conjunction with the implementation of statewide number pooling:

- Central Office Code Sharing
- Thousand Block Pooling
- Individual Telephone Number Pooling
- Unassigned Number Porting

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- Elimination of Reliance on Incumbent Local Exchange Company Rate Centers for Pooling Areas
 - Rate Center Consolidation
 - Architecture for Inclusion of Resources of Non-Participants

Most of these items have been extensively evaluated in the national forums such as the Industry Numbering Committee (INC), NANC and many of their various subgroups and task forces. For this report, we have extracted necessary information or simply made reference to voluminous documents prepared by national forums.

In order to implement number pooling on a statewide basis in Colorado, it is necessary to assume that Colorado will not act contrary to the direction being taken at the national level in terms of pooling proposals, guidelines, and/or requirements. Therefore, any effort in Colorado must take into account the potential effect any recommended changes will have on other states or on national guidelines. Our dual goal is to provide a realistic solution to the optimization of the numbering resource in Colorado while supporting the national goal of complete nondiscriminatory access to telephone numbers by all providers.

5.1 CENTRAL OFFICE (CO) CODE SHARING (“NXX” CODE SHARING).

5.1.1 Description

Code sharing is a method of improving number utilization in a non-LNP environment using traditional switching capabilities. It allows the sharing of numbers from a single CO code or NXX between two or more switching entities. Most applications designate specific number blocks to be dedicated to each switch, although this is not a requirement. Code sharing has been used primarily by established local exchange carriers with multiple switches within a metropolitan area such as Denver. Thus far code sharing has not been used between switches belonging to different service providers in Colorado.

5.1.2 Application

For economic reasons, it is often advantageous to provide certain customer services such as ISDN or Digital Centrex using a small “remote switching unit” (RSU) which is “hosted” by a larger digital switch located in a different wire center or rate center. Usually these RSU’s do not provide sufficient line capacity to justify the assignment of a full NXX consisting of 10,000 numbers. Instead, blocks of numbers from an NXX assigned to the non-digital (analog) switch located in the same wire center are reassigned to the RSU. These “blocks” are usually full blocks of 1,000 telephone numbers. A typical arrangement would have 8,000 numbers from an NXX assigned to customers in the analog switch and the remaining 2,000 numbers serving customers on the RSU. These code sharing arrangements are reflected in the Local Exchange Routing Guide (LERG).

5.1.3 Potential Benefits

CO Code Sharing promotes improved number utilization by eliminating the need to assign an entire NXX in situations where only a few thousand numbers are required. This may reduce the quantity of CO codes needed and delay the need for area code relief.

5.1.4 Limitations

Because this method uses traditional switching technologies rather than database query methods to route calls to the correct terminating end office (based on the thousands' digit or hundreds' digit of the dialed number), the impacts on switch software capacities can be significant. Specific rate center configurations relative to switch locations can limit its application in much the same way as LNP and Number Pooling will be limited, although the limitations of code sharing are greater. It may prove beneficial to convert existing code sharing applications to Number Pooling methods when the latter capabilities are introduced.

Figure 1 demonstrates the routing of calls in a code sharing environment.

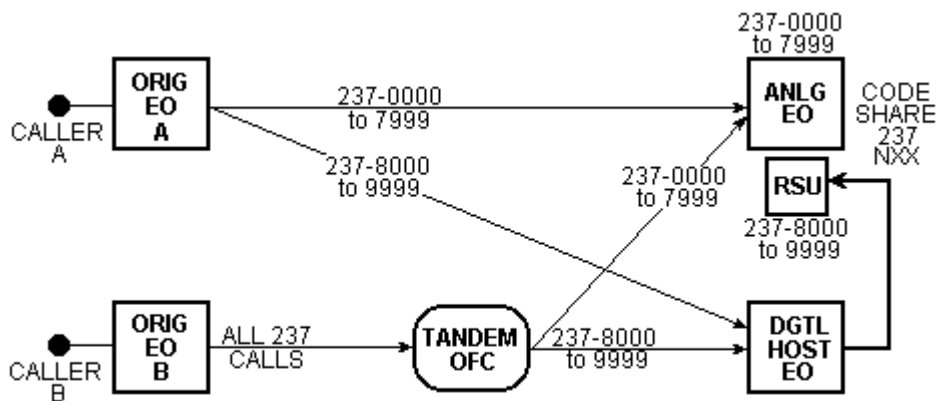


Figure 1 - Code Sharing Diagram

5.2 THOUSAND BLOCK POOLING (OR THOUSAND BLOCK ADMINISTRATION)

In the following discussion of thousand block pooling, it should be understood that the process currently undertaken at the national level is different from the type of pooling that might be undertaken in a statewide number pooling scenario. The development of thousand block pooling and all associated guidelines at the national level has restricted the number pools to rate areas¹⁶. In evaluating statewide number pooling, it is evident that

¹⁶ "Rate area" is the term currently preferred at the national level to define what is also referred to in this document as a rate center. In Colorado, the term "rate area" has never been used, except in conjunction with a base rate area as it is defined in local exchange tariffs. In order to avoid confusion, we have used the term "rate center" ubiquitously throughout this document.

geographic areas larger than a rate center must be used. The discussion following is related to the thousand block pooling guidelines developed at the national level and is therefore limited to rate centers.

5.2.1 Description

Thousand Block Pooling involves the allocation of blocks of sequential telephone numbers within the same NXX to different SPs, which serve customers within the same rate center. All ten thousand numbers within each NXX continue to be assigned to one rate center, but are allocated among multiple SPs at the thousand-block (NXX-X) level. An example of this arrangement is shown below:

303-999-7XXX	SP-1
303-999-2XXX	SP-2
303-999-4XXX	SP-3 (LERG Assignee)
303-999-3XXX	SP-4
etc.	

Using this example, SP-1, SP-2, SP-3, etc., can each assign numbers from their allocated thousand-block within the 303-999 NPA-NXX, but only to customers residing within or obtaining service associated with the designated rate center. This methodology preserves two of the three historical functions of the NXX (call rating and toll discrimination), but breaks the association of an NXX with a particular SP switch. The switch identification is accomplished via an external data base look-up.

Significantly, the 303-999 NXX shown in the example would still be assigned in its entirety to one switch entity/one SP within the Bellcore Local Exchange Routing Guide (LERG). The code holder would be referred to as the LERG Assignee. The LERG Assignee, however, would only be permitted to assign numbers within the particular thousand-block or blocks that have been allocated to it.

5.2.2 Thousand-Block Pooling Architecture

The architecture proposed to support thousand-block pooling is the IN/AIN (Intelligent Network/Advanced Intelligent Network) system also used for LNP. Use of this external data base system for number pooling is described in detail as the NXX-X/LRN proposal within the Industry Numbering Committee's Report on Number Pooling. Number pooling uses existing LNP databases, which contain specific routing information for blocks of numbers within a pooled NXX, and which have been allocated to different SPs. Pooling allows individual SPs to retain their own numbering inventory, the allocated thousand block, from which they can assign telephone numbers to their customers. If the SP is not the LERG-assignee, they must treat the assigned numbers as ported, populating them first within the LNP databases prior to assigning them to customers. Use of the existing LNP architecture avoids the need to perform 7-digit screening (NPA-NXX-X) within each switch on calls to pooled numbers.

5.2.3 Additional Assumptions

Additional details regarding thousand block pooling may be found in the Industry Numbering Committee's Thousand Block (NXX-X) Pooling Administration Guidelines and in the report of the Numbering Resource Optimization working group to the NANC. The following assumptions have been identified as appropriate for thousand-block number pooling at a statewide level. In order to accomplish pooling at a statewide level, it may be necessary to consider modification of the national standards for number pooling.

- Service providers offering local number portability in accordance with the Telecommunications Act of 1996, and as ordered by FCC Report and Order CC Docket No. 95-116, or other applicable state and/or federal mandate, shall participate in number pooling where number pooling is implemented. Carriers not offering local number portability may be required to donate unused thousand blocks to the pool, if technically capable. However, these same carriers may not be required to receive thousands blocks, and may need to have an entire NXX.
- Service providers obtaining numbers from the pool shall be obligated to contribute their eligible numbers to the pool in accordance with industry guidelines.
- Switches that are assigned thousand-blocks from within pooled NXXs must be LNP capable. This capability is needed to support an LRN for the routing of calls to customers within those thousand blocks, as well as to launch LNP queries on calls to blocks allocated to other SP switches.
- Pooled numbers within an NXX, as defined in the Local Exchange Routing Guide (LERG), will only be assigned to customers residing within the State of Colorado. As such, each NXX will no longer be associated with one particular rate center, but will be associated with one particular switch for LERG assignment purposes. The latter requirement is needed for default routing purposes, in situations where originating and intermediate networks are unable to perform LNP queries. Furthermore, it ensures that each switch has at least one NPA-NXX that can be used as the LRN identification for ported/pooled numbers.
- There are extensive SP responsibilities associated with being a code and block holder. These responsibilities are detailed in the INC document Thousand Block (NXX-X) Pooling Administration Guidelines.
- A neutral, third party will be responsible for building, maintaining and administering each pool.

5.2.4 Summary

Based on the information available and industry work to date, the projected

implementation date for national thousand block pooling at the rate center level is estimated to take between 10 and 19 months from the date of a regulatory order.¹⁷ It should be noted that these implementation time frames are estimates and are dependent upon the availability of the required hardware and software changes from vendors.

5.3 INDIVIDUAL TELEPHONE NUMBER (ITN) POOLING

5.3.1 Description

This section describes a proposed architecture to implement Individual Telephone Number (ITN) pooling with various alternative approaches identified in specific elements as currently envisioned. ITN pooling would utilize the same technology used to implement Location Routing Number/Local Number Portability (LRN LNP). ITN pools would be restricted to the smallest geographic area used to distinguish rate boundaries (referred to as a "rate center" or "rate area"). However, the Task Force is considering expansion of pooling beyond current ILEC rate centers. In addition, participation by non-LNP-capable carriers, where technically feasible, will be considered.

¹⁷ For the complete description of timeframes and work plan associated with the implementation of thousand block pooling, please refer to the NANC report on Number Resource Optimization to the Common Carrier Bureau dated September 23, 1998.

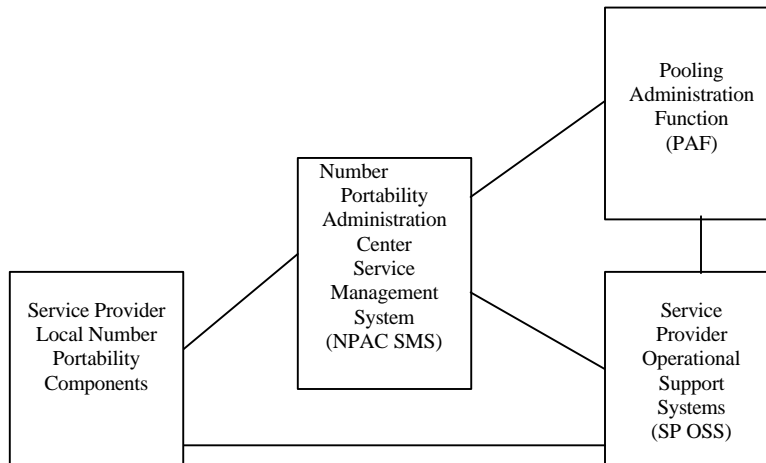


Figure 2 – ITN Pooling Functional Architecture

Referring to Figure 2, the ITN pooling functional architecture consists of the following high level functions. This diagram is illustrative and is not intended to depict any specific Service Provider Local Number Portability (SP LNP) system or systems implementation:

Service Provider (SP) Operational Support Systems (OSSs): These systems and/or functions are updated by the individual SPs and will process new, change or disconnect orders for customers. In an ITN pooling environment, these systems will interface with the Pooling Administration Function (PAF) to obtain pooled Telephone Numbers (TNs) for use by the SP. These systems will also provide the Service Order Administration (SOA) functions that interface with the NPAC SMS.

SP LNP Components: These components perform the LNP Local Service Management System (LSMS) functions over an interface with the NPAC SMS where the LNP network databases reside which provide LNP routing data to the SP switching systems which facilitate the processing of calls to ported TNs.

Number Portability Administration Center Service Management System (NPAC SMS): This is the third-party manager and system that currently supports the processing of SP orders and facilitates the distribution of LNP data to the SP LNP components. In an ITN pooling environment, the NPAC SMS will also interact with the third-party Pool Administration System (PAS).

Pooling Administration Function (PAF): This is comprised of both the Pool Administrator (PA) and PAS that will be required to support ITN pooling. The PAF will provide mechanisms to allow a SP to request and obtain numbering resources to support customer or administrative demands, and to replenish the SP inventory. The PAS is the hardware and software system that will support this capability.

Though the above components comprise the high level ITN pooling functional architecture, there are several implementation alternatives that were evaluated by the ITN

Task Force of the NRO. For a detailed description of these alternatives,¹⁸ refer to the appendices to the September 23, 1998 NANC Report to the FCC.

5.3.2 Implementation

From estimates made by the ITN Task Force in the NANC Report to the FCC, it will take between four to six years from the date of a regulatory order to implement ITN pooling at the rate center level. Statewide ITN pooling might take longer.

5.3.3 Cost Estimates

The Task Force has not done specific cost estimates for ITN pooling in Colorado, especially as it pertains to statewide pooling. However, the information presented by the industry in NANC report to the FCC describes the types of cost categories that are relevant in considering ITN pooling. They have identified many of the costs associated with Service Providers and End Users. The Service Provider costs include NPAC SMS transaction changes, NPAC SMS modifications, development, deployment and operation of the Pooling Administration Function, Service provider LNP and OSS modifications, and Public Safety system modifications. Although specific End User costs have not been identified, it is generally understood that end users will ultimately bear most of these costs.

5.4 UNASSIGNED NUMBER PORTING (UNP)¹⁹

5.4.1 Description

Unassigned Number Porting (UNP) is a telephone number (TN) sharing and/or optimization method in which available TNs in one service provider's (SP) inventory are ported (using Location Routing Number (LRN) methodology) to another SP. This would be performed under the direction of a neutral third-party coordinator, for assignment by the second SP to a specific customer. UNP differs from pooling in that TNs are not donated to a pool but are transferred directly from one SP to another SP, probably under the direction of a neutral third-party coordinator. The neutral third party has more of a coordination responsibility under UNP whereas there are additional administrative responsibilities involved under pooling. UNP would be utilized to provide numbers to a service provider who has insufficient numbers available for assignment for a specific customer request for service on a rate area basis. Guidelines for UNP have not been developed.

5.4.2 Architecture

¹⁸ There are three proposals attached to the NANC Report to the FCC. Those proposals were made by AT&T, MCI and Lockheed-Martin.

¹⁹ Also see Minority Comments of MCI Worldcom in the NANC Report to the FCC on Number Resource Optimization for another position on unassigned number porting, especially relating to time frames for implementation.

A major architectural consideration for UNP is the identification of the functional process flow between SPs and the Coordinator. The nature of the processes and interfaces, manual or mechanized, has not been agreed upon in the industry. It should be noted, that in order to accomplish this in a timely manner, significant OSS and internal process changes may be required by many SPs.

5.4.3 Implementation

Current estimates by UNP proponents are for a near term interim trial proposal (Phase 1) to be accomplished in 2¼ months and 18-19 months for the initial implementation of Phase 2. These two time estimates do not necessarily occur sequentially and there may be some overlap. Neither the Task Force nor any national forums have evaluated these time estimates.

5.4.4 Costs

It should be noted that no qualitative or quantitative analysis of either the costs or the benefits of UNP was performed by the Task Force to support the assumptions in this report.

The magnitude of costs will depend on the robustness of the implementation (i.e., mechanized or manual). The types of Service Provider costs expected are NPAC transaction charges, UNP Coordination, NPAC modifications, Service Provider LNP Network Systems, Service Provider UNP Administration Access, Service Provider Operational Support Systems, and E911 modifications. It should be acknowledged that costs incurred by SP's might eventually be recovered through end users. Cost recovery will need to be addressed by appropriate regulatory entities prior to implementation of UNP.

At this time, the Task Force does not intend to make any decisions on UNP; therefore, we recommend that the Task Force monitor and participate in the national discussions surrounding this issue. This does not preclude further study by the Task Force on UNP.

5.5 ELIMINATION OF RELIANCE ON THE RELATIONSHIP OF AN NXX TO A SINGLE RATE CENTER

Existing rate center configurations have historically been a primary factor in restricting the efficient use of numbering resources. Rate centers are products of the original wireline local exchange and toll networks. Rate centers are designated geographic locations defined by a vertical and horizontal coordinate system (V & H coordinates) based on latitude and longitude. Each NXX is assigned to a specific rate center for the purpose of rating calls. By designating a specific location point for an NXX using V & H coordinates, the distance for a call between two points can be measured and rated accordingly. The current definition of LRN architecture for LNP allows wireline

telecommunications customers that elect to change local exchange service providers, within the same rate center, to retain existing telephone numbers, i.e., the old number is "ported" to the new provider. In order to implement statewide pooling, it will be necessary to modify or eliminate this restriction to rate centers.

5.5.1 Rate Centers

Rate centers are the traditional method for rating telephone calls and differentiating between local and toll calls. As described above, each rate center has a specific location described by V & H coordinates (or latitude and longitude) describing its physical location. These coordinates are used as the basis for determining the distance between two rate centers for call rating purposes. In a single provider wireline telecommunications world, this linking of NPA-NXX to rating causes no problem. As multiple providers enter the competitive market with their own serving areas, traditional rate centers become more of an impediment in implementing a wider geographic pooling scheme. Rate center issues in the implementation of local number portability between ILECs and CLECs and between wireline and wireless have become a recurring theme at the national forums and at the FCC.

5.5.2 Long-Term Proposal to Remove the Dependence on Existing Rate Centers

In order to successfully consider expanding number pooling to the entire state and to gain the resulting benefits, it is necessary to consider eliminating some of the dependence on existing rate centers. It should be noted that this recommendation does not require the elimination of rate centers per se, only the elimination of some of the dependencies. The elimination of the link between NPA-NXX and call rating should be examined further. As competition increases in the telecommunications market in Colorado, it may be assumed that telecommunications providers will be offering a variety of calling plans in their specific markets. The reliance upon common "free" local calling areas among all providers has already begun to disappear in the competitive market. However, there are many significant issues to resolve before accepting the premise of mass exodus from the requirement for common local calling areas (*e.g.*, consumer confusion and network rating and routing problems).

The elimination of dependence on existing rate centers involves extensive changes in the rating and routing systems of all carriers. Today, carriers rely on the fact that a specific NPA-NXX corresponds to a specific geographic point. If we remove this postulate, something must replace it to enable carriers to successfully rate and route calls. The current suggestion of the Task Force is to further investigate the possibility of using the Signaling System 7 (SS7) network to transport the information required for the rating and routing of every call. This will result in a database query for every call. It would require additional location information to be carried on the SS7 call record (*e.g.*, network addresses, LRNs, and/or V&H coordinates for the calling and called parties). In addition to the ability to rate a call using this new location information, it might be necessary to develop systems to inform consumers of what type of call they are making (*e.g.*, toll

versus local) through some type of audible or visual means. For example, a consumer could be provided identifiable tones to indicate that a toll call is being made (in much the same way as current toll notification is done for customers using various CLASS features).

5.6 RATE CENTER CONSOLIDATION

Rate Center Consolidation is a very important telephone number efficiency method. In the case where a local exchange service provider enters a market, it must obtain an NXX code for every rate center. In metropolitan areas such as Denver, the number of NXX codes required by each new competitive local exchange carrier corresponds to the number of rate centers in which they plan to provide service. If the number of rate centers is reduced, *i.e.*, rate center consolidation, the number of NXX codes is reduced accordingly. The Task Force is considering long-term measures to eliminate the dependence on rate centers. However in the interim, rate center consolidation provides a more efficient use of numbering resources.

The Commission has ordered a consolidation of rate centers within the 303 NPA in Colorado from 43 rate centers to 16 rate centers. This rate center consolidation encompasses all of the current Denver Metropolitan Statistical Area (MSA).²⁰ This is scheduled to be implemented by December 31, 1998.

The Task Force concludes that it is advantageous to consider further rate center consolidations in areas outside the Denver metropolitan area. Rate center consolidation in more areas of Colorado would ameliorate the potential future impacts in the areas outside Denver on number resource exhaustion caused primarily by competitive entry. It should also be noted that the changes in the configuration of local calling areas in Colorado when further rate center consolidation occurs bring revenue and costs questions into the decision process as well.

5.7 ARCHITECTURE FOR INCLUSION OF RESOURCES OF RURAL LOCAL EXCHANGE COMPANIES

Rural local exchange companies operating in Colorado are not participating in LNP nor are many of them equipped to participate if they were requested to do so. The Telecommunications Act and Colorado statute do not require small rural LECs to participate in competitive requirements such as LNP until special provisions have been met. Many of the short and long term solutions to numbering efficiency include the use of LNP architecture. In most cases, carriers not participating in LNP are not being required to participate in pooling and other number conservation methods.

The unused numbering resources of LECs operating in rural Colorado are quite

²⁰ The current Denver MSA is defined as Denver, Jefferson, Adams, Arapahoe, and Douglas counties. The area covered by the 303 NPA (where rate center consolidation is to occur) includes all exchanges in each of these five counties

large. The reason no attention has been given to them is that most of the resources are in the 719 and 970 NPAs where there is no immediate threat of NPA exhaust. The other reason is because no solution has been proposed to allow the small rural exchanges to provide resources to the pool of numbers without imposing significant costs to those companies. The Colorado Task Force recommends further study into providing a system architecture that allows rural LECs to participate to the extent possible without imposing costs on the companies and consumers.

5.7.1 Rural LEC Proposal

The current LRN LNP architecture allows for the carrier delivering a call to a LEC (in an LNP-capable area) to query the LNP database to determine the LRN of the correct switch to terminate the call. In the case of LNP, all local exchange carriers in that area must participate in LNP. However, it may not be necessary that all LEC exchanges be LNP-capable before numbering resources can be shared. Consider the following scenario:

1. A LEC exchange has total 400 telephone numbers assigned or reserved (all within the 0000-0999 block). However, it has an entire NPA-NXX (10,000 numbers) assigned to the switch. Assume that blocks 1000-9999 are released to the "pool administrator" for assignment elsewhere in the NPA or the entire state.
2. The small exchange switch is configured so as to send all calls from its own subscribers to telephone numbers in the blocks 1000-9999 to a LATA tandem or similar LNP-capable switch. The small exchange switch is also programmed to handle all calls originating from its own subscribers to telephone numbers in blocks 0000-0999. This includes vacant number announcements.
3. All calls coming to the LATA tandem with terminating telephone numbers that are within the 0000-0999 blocks are sent to the small LEC switch. All other calls (blocks 1000-9999) are routed using a query to the LNP database and routing to the appropriate LRN. All vacant number treatment is handled by the default LERG assignee (unless it is assigned to another end office switch).

6.0 Functional Considerations

The implementation of statewide number pooling in Colorado carries functional considerations above and beyond the implementation of number pooling as being proposed at the national level. As previously stated, the national implementation of number pooling (either thousand block or ITN) is limited to:

- (1) pooling within an ILEC rate center;
- (2) areas that have implemented LNP using LRN architecture; and
- (3) carriers who participate in LNP using LRN architecture.

The documentation being produced at the national level provides extensive discussions on the functional considerations just to implement pooling within these constraints. To

expand the pooling capability to encompass the entire State of Colorado involves additional considerations such as local and tandem switch modifications, SCP/STP capacity expansions; NPAC data expansion; SS7 data modification; rating and routing changes; and SP OSS changes. This section discusses only those functional considerations that are incremental to the pooling processes already being developed at the national level.

6.1 LOCAL AND TANDEM SWITCH MODIFICATIONS

The expansion of number pooling to the entire state carries certain assumptions as described in Section 4 of this document. The network architecture assumed for pooling includes the necessity of all carriers participating in the pooling process also to be LNP-capable. For statewide pooling to be effective, the majority of carriers and geographic areas in the state must be LNP-capable. Additionally, if the architecture for small rural exchanges described in Section 5.7 is adopted, possible major modifications or enhancements may be required to the tandem switches, *e.g.*, handling of additional routing and vacant number announcements.

6.2 SCP/STP CAPACITY EXPANSION

The current capacity of the SCP/STP devices for routing calls is partially based upon projected needs of service provider portability within a rate center. It has been projected by members of the national forums that SCP/STP capacity may need to be increased in consideration of pooling within the rate center in LNP-capable areas. The expansion of pooling to the entire state involves even greater volumes of data to be stored in the SCP databases. In addition, the data transfer capability of the SCP/STP must be significantly increased.

6.3 NPAC DATA EXPANSION

Data expansion requirements for SOA (Service Order Activity) and Local Service Management System (LSMS) input/output capability must be coordinated with NPAC /SMS vendor requirements.

6.4 SS7 DATA MODIFICATION

As described in Section 5.5.2, the Task Force wants to consider alternative architectures that allow participation in statewide pooling by SS7-capable, but non-LNP-capable service providers. In order to accomplish this goal, it is necessary to break some of the ties to rate centers for routing and rating. The SS7 architecture provides for the transmission of specific data using the SCP/STPs to route calls to the appropriate destination switch. This architecture also allows the system to query the database for LNP purposes in LNP-capable areas. It is our opinion that there exist certain portions of the SS7 data records that could be used for providing additional information regarding the location of the calling party and the called party (assuming that specific NPA-NXX combinations do not necessarily correspond to a specific rate center). This location

information could possibly include V&H coordinates, LRNs, or network addresses of the originating and terminating switches. This information would be carried on the SS7 data record so that real-time rating systems could function and end users could be notified of call types (*e.g.*, toll versus local). If the Task Force decides to pursue this option, it will establish a technical subgroup to define the problem and to investigate the possibility of such an architecture including the probable implementation time frames for the proposal.

6.5 RATING AND ROUTING CHANGES

There are rating and routing changes that will become necessary to implement statewide pooling. The primary reason is that the NPA-NXX of the telephone number would no longer correspond to a particular rate center. Technically, telephone numbers from any NPA-NXX could be assigned anywhere in the state. From an LNP architecture perspective, this requires modification to the process of determining call routing. In the current LNP architecture, the N-1 switch²¹ will perform the database query. If we have statewide pooling of numbers, all calls within the state or entering the state from outside will require a database query prior to handing the call off to the appropriate LEC. All intrastate calls must either be terminated in the originating switch or be queried at call origination in the database for correct LRN data. Additionally, all calls to non-LNP-capable rural LECs must be routed according to the method described in Section 5.7.1 if this method is deployed.

Rating of calls under this new architecture is a more complex process and involves substantive changes to the carriers' network and internal OSS rating systems. In today's environment, a local switch can determine whether a call is local or toll based on internal translation tables. This table lookup in the switch allows the caller to be informed what dialing patterns are necessary for that call. With statewide pooling, a different functional architecture must be developed. Since a database must be queried to correctly route the call, then a similar or combined process may be used to correctly perform local versus toll discrimination. For example, if the originating and terminating switch have network addresses in different local calling areas, then a toll indicator is necessary. Additionally, as operator handled calls require real-time rating, there must be changes in the rating systems to accommodate the new data structure.

The Task Force recommends that further study on this complex issue is necessary for the complete evaluation of statewide number pooling. Since rating and routing changes require specific expertise not available on the Task Force, it may become necessary to establish a separate technical subgroup to address this issue.

6.6 SERVICE PROVIDER OPERATIONAL SUPPORT SYSTEM CHANGES

²¹ The N-1 switch is the switch in the network just prior to passing the call to the terminating end office. This switch performs the database query so that calls can be passed directly to the switch serving the customer.

Many changes in service provider operational support systems (SP OSS) are currently proposed for the implementation of number pooling. Additional consideration must be given to changes necessary to implement pooling on a statewide basis. The internal administration of numbers by each SP must be modified to allow for number administration that is not specific to geographic constraints (*i.e.*, an NPA-NXX does not necessarily correspond to a specific rate center). It is assumed that rating systems for calls will need to be modified. Operational support systems devised for LNP and number pooling within a rate center must be expanded to accept the additional data required.

The Task Force recommends that further study on OSS issues is necessary for the complete evaluation of statewide number pooling. Since operational support systems changes require specific expertise not available on the Task Force, it may become necessary to establish a separate technical subgroup to address this issue.

6.7 IMPACT ON CUSTOMER-PROVIDED TELEPHONE SYSTEMS

The Task Force is aware of the effects of any proposed changes in numbering schemes to customer-provided telephone systems. We are aware that PBX systems, electronic coin telephone systems, E-911 Public Safety Answering Point (PSAP) equipment, and alarm systems can be significantly impacted by the type and extent of changes suggested herein. Each of these systems may be tied to seven-digit dialing limitations, specific rating or routing on NPA-NXX designations, or other more complex translations related to existing numbering schemes. It is imperative that the Task Force do further analysis in these areas prior to making a final recommendation.

First, the Task Force will examine the requirements of each of these customer-provided telephone system types to determine the effect on each with respect to the statewide pooling proposal. Next, an effort will be made to determine the extent, cost, and time of implementation required for modifications of these system types. Finally, every effort will be made to determine if additional system types are affected and to what extent.

7.0 Criteria for Assessment of Alternatives

Much of the evaluation of the alternatives in this document is subjective based on substantial industry experience rather than empirical support. Obtaining any relevant cost data is extremely unrealistic since much of the actual design changes for the proposed solution are unknown and individual service provider costs are not easily developed at this early stage. Therefore, the evaluation of the alternatives comes down to two basic premises. First, the Task Force does not wish to deviate from the national pooling architecture and guidelines. Second, the Task Force desires to move the pooling discussion from the *level* of pooling (*i.e.*, size of pooling block) to the *geography* of pooling (*i.e.*, beyond the rate center).

8.0 Evaluation of Alternatives (Including Benefits)

There are several alternatives described in Section 5 of this document that were considered by the Task Force for the implementation of statewide number pooling in Colorado. We believe that some form of number pooling will be developed throughout the North American Numbering Plan Area during the next year or so. Based on the FCC request to the NANC,²² we believe that the FCC may target nationwide number pooling by the end of 1999. The NANC has determined that number pooling at the thousand block level is the first step to be implemented. Following the implementation of thousand block pooling, it is industry consensus that individual telephone number pooling is a logical next step. Recognizing that national standards do not exist for statewide pooling, Colorado wishes to conform to the national pooling standards as much as possible with respect to the levels of pooling. Therefore, we will assume that Colorado will not develop pooling guidelines that are specific to Colorado, but instead will follow nationally developed guidelines to the extent possible.

The expansion of pooling, at either the thousand block level or ITN level, to the entire state requires the completion of several tasks described in sections 5 and 6 of this document. We are assigning these tasks to the Task Force or a designated subgroup for completion. Unless further study on these tasks presents unforeseen obstacles, we recommend that the Commission allow the Task Force to continue to study and quantify the implementation of statewide number pooling.

The Task Force has evaluated some of the benefits of statewide number pooling and those benefits are shown in the following table.

²² See letter to Alan Hasselwander, Chair, NANC from Richard Metzgar, Chief, Common Carrier Bureau, dated March 23, 1998.

**STATEWIDE NUMBER POOLING
LIST OF BENEFITS**

Benefit	Consumers	Wireline	Interexchange Carriers	Wireless
<i>Availability of all numbers among all providers</i>	Choice of providers	Competitively neutral Access to more numbers	N/A	Competitively neutral
<i>Conservation and efficient utilization of numbers</i>	Extend life of NPAs	Extend life of NPAs & NANP	Fewer network changes	Extend life of NPAs & NANP
<i>Exchange boundaries less important</i>	Possibility of geographic number portability	More flexibility of number assignment	N/A	In place
<i>Accommodation of customer requests</i>	Customer satisfaction	Customer satisfaction	N/A	Customer satisfaction

9.0 Requirements

The Requirements section is a detailed listing of the requirements necessary by all parties to implement the proposal. This section will be written after all previous activities and study activities are completed.

10.0 Implementation

The Implementation section is a detailed listing of the specific implementation schedules and tasks necessary by all parties to implement the proposal. This section will be written after all previous activities and study activities are completed.

11.0 Conclusions and Recommendations

The Task Force has concluded that the evaluation of statewide number pooling is an effort that will provide sufficient benefit in telephone numbering efficiency for Task Force efforts to continue with additional evaluation. The Task Force has not yet initiated the next steps in the analysis because the Task Force feels it needs Commission direction prior to continuing with the additional, more detailed evaluation. As the Commission is well aware, significant effort is being undertaken nationally to evaluate and/or implement number conservation methods, such as thousand block or individual telephone number pooling and/or unassigned number porting. The Task Force does not wish to duplicate or

interfere with those efforts. We unanimously agree that the complete evaluation of statewide number pooling and possible recommended implementation by the Task Force will not occur until after direction is received from the FCC on a national standard for number pooling or UNP. Therefore, the Task Force does not intend to reach any conclusions or duplicate work regarding the use of any these particular conservation methods in this document.

As an additional issue in its study of statewide number pooling, the Task Force has concluded that it is extremely important that the specific benefits and costs of statewide pooling be examined prior to making any recommendations. The lack of both cost and benefit information would not provide the Commission with sufficient information to make a final decision in this matter.

In this report, the Task Force makes numerous recommendations to the Commission. The Task Force recommends that the Commission direct the Task Force:

- to continue its efforts in evaluating statewide number pooling;
- to direct its efforts toward the geography of pooling (beyond the rate center) rather than the level of pooling (size of pooling block);
- to continue with the assumption that Colorado will not develop pooling guidelines that are specific to Colorado, but instead will follow nationally developed guidelines to the extent possible;
- to further evaluate all the issues identified in sections 5 and 6 of this report in conjunction with statewide number pooling;
- to provide the Commission with sufficient cost, benefit, and impact information to allow the Commission to make a decision on statewide number pooling;
- to establish a technical subgroups to evaluate the effects of statewide pooling on the Signaling System 7 network, both within and outside the states;
- to establish a technical subgroups to evaluate the effects of statewide pooling on individual company operational support systems;
- to evaluate the effects of statewide pooling on customer provided telephone systems;
- to develop and evaluate cost effective solutions for the inclusion of rural local exchange companies in statewide number pooling;
- to evaluate changes necessary to rating and routing systems to implement statewide number pooling.

12.0 Common Industry Definitions

Active Block - A block formally assigned by the Pool Administrator and implemented by the block holder in the Public Switched Telephone Network (PSTN) for specific routing or rating requirements

Additional NXX-X Block Assignment for Growth - A block assigned to a switching entity or point of interconnection subsequent to the assignment of the first code (See: Initial Block), for the same purpose as a block that was previously assigned to the same switching entity or point of interconnection. A "Growth Block" is requested

when the line numbers available for assignment in a previously assigned block code will not meet expected demand.

Affected Parties - Affected parties are a) those entities that have applied for and/or received central office block (NXX-X) assignments or reservations within the NXX b) administrative entities involved in number administration, number portability or number pooling.

Aging of Telephone Numbers - Aging is the process of making a disconnected telephone number unavailable for re-assignment to another subscriber for a specified period of time. An aging interval includes any specific announcement treatment period, as well as the blank telephone number intercept period.

Allocated Telephone Numbers - The block of telephone numbers (NXX or 1000 block) which have been assigned to a service provider via the number administration process.

Assigned Telephone Numbers - (Not yet defined by Industry)

Authorized Representative of Block Applicant - The person from the applicant's organization or its agent that has the legal authority to take action on behalf of the applicant.

Block - 1,000 telephone numbers with all numbers being from within the same 1,000 block range within the NXX

Block Applicant - The entity for whom a 1,000 block (NXX-X) is being requested

Block (NXX-X) Exhaust - A point in time at which the quantity of TN's within existing block (NXX-X) which are "Available for Assignment" equals zero within a switching entity/POI or, conversely, when the quantities of "Working Telephone Numbers" plus "TN's Unavailable for Assignment" equal 1,000 times the quantity of existing blocks (NXX-X) assigned to a switching entity/POI.

Block Holder - The entity to whom a 1,000 block (NXX-X) has been assigned for use.

BRIDS - The Bellcore Rating Input Data Base System (BRIDS) contains data in the rating of calls. Data supports all CO Codes assigned through these Guidelines, as well as all CO Codes in place prior to the existence of these Guidelines, and covers all Numbering Plan Areas (NPAs) administered under the North American Numbering Plan (NANP). BRIDS is a replacement database for BRADS

Central Office Code - The sub-NPA code in a telephone number, i.e., digits D-E-F of a 10-digit NANP Area address. Central office codes are in the form "NXX", where N is a number from 2 to 9 and X is a number from 0 to 9. Central office codes

may also be referred to as "NXX codes" or "prefixes".

CLLI - Common Language Location Identifier is an eleven-character descriptor of a switch and is used for routing calls.

CO Code (NXX) Exhaust - A point in time at which the quantity of TN's within existing CO codes (NXX) which are "Available for Assignment" equals zero within a switching entity/POI or, conversely, when the quantities of "Working Telephone Numbers" plus "TN's Unavailable for Assignment" equal 10,000 times the quantity of existing CO codes (NXX) assigned to a switching entity/POI. Where CO code sharing occurs or partial CO codes are assigned to a switching entity/POI, the latter number should be adjusted accordingly.

Certification - (When used by the applicant): A part of the Central Office Block (NXX-X) Assignment request attesting, through a formal statement, that information contained within the assignment request is true, accurate, and complete to the best of his/her knowledge. (When used by regulator): Where applicable, to authorize, in writing, an entity to provide a telecommunications service in the relevant geographic area. Such authorization is the responsibility of the appropriate regulatory agency.

COCUS - Central Office Code Utilization Survey (COCUS) is conducted annually by NANPA from direct input received from Central Office Code Administrator(s) in order to monitor central office code utilization, projected exhaust of NPAs and demand for new NPAs to provide code relief. The purpose of COCUS is to provide an annual overall view of both present and projected CO code (NXX) utilization for each NPA in the NANP.

Code Administrator - Entity(ies) responsible for the administration of the NXXs within an NPA.

Code Holder - The entity to whom a CO code (NXX) has been assigned for use at a Switching Entity or Point of Interconnection it owns or controls.

Conservation - Consideration given to the efficient and effective use of a finite numbering resource in order to minimize the cost and need to expand its availability in the introduction of new services, capabilities and features.

Contaminated Block - A contaminated block is a block of 1000 (X000-X999) TNs in which at least one number is in any of the following categories:

- a) Administrative Number
- b) Aging Number
- c) Assigned Number
- d) Reserved Number
- e) Dealer Numbering Pools

-
- f) Wireless E911 Emergency Services Routing Digits (ESRD)
 - g) Numbers classified as “Soft dial tone”

Donating Service Provider/Switch - The service provider or switch which ports (exports) a telephone number from their switch to another switch. In a Number Pooling scenario, this service provider is also designated the Default Code Holder for the NXX.

ERCs - Easily Recognizable Codes - NPA Codes that due to their unique, recognizable digit pattern (i.e., common 'B' and 'C' digit) convey certain unique knowledge re: a call to a telephone number other than the number being dialed (e.g., 800+).

Effective Date - The date by which routing and rating changes within the PSTN must be complete for the assigned block. Also, the date by which the block becomes an active block.

INC - Industry Numbering Committee, An Industry Forum sponsored by the Alliance of Telecommunication Industry Solutions (ATIS) It provides an open forum to address and resolve industry-wide issues associated with the planning, administration, allocation, assignment and use of numbering resources and related dialing considerations for public telecommunications within the North American Numbering Plan (NANP) area.

Initial Block - The first geographic NXX-X block assigned at a unique switching entity or point of interconnection.

In Service - An active block in which specific subscribers or services are utilizing assigned telephone numbers.

Interested Parties - Interested parties are service providers providing service within an area in which number pooling has been implemented.

Jeopardy NPA - A jeopardy condition exists when the forecasted and/or actual demand for NXX resources will exceed the known supply during the planning/implementation interval for relief. Accordingly, pending exhaust of NXX resources within an NPA does not represent a jeopardy condition if NPA relief has been or can be planned and the additional NXXs associated with the NPA will satisfy the need for new NXX codes.

Jeopardy Rate Center - A jeopardy condition exists when the forecasted and/or actual demand for NXX-X resources will exceed the known supply during the planning/implementation interval for relief. Accordingly, pending exhaust of NXX-X resources within rate center does not represent a jeopardy condition if NXX relief has been or can be planned and the additional NXX (s) associated with the Rate Center will satisfy the need for new NXX-X blocks.

LERG - Local Exchange Routing Guide: document containing information about the local routing data obtained from the Routing Data Base System (RDBS). This information reflects the current network configuration and scheduled network changes for all entities originating or terminating PSTN calls within the NANP excluding Canada.

LERG Assignee - The entity to whom a CO code (NXX) has been assigned and/or for performing LERG assignee functions at a Switching Entity or Point of Interconnection it owns or controls. Code Holder does not necessarily imply use of all blocks within the NXX.

LRN - Location Routing Number

Major Vertical or Horizontal Coordinates - A five-digit number used with the Vertical Coordinates and Horizontal Coordinates to pinpoint the location of a rate center. The Vertical and Horizontal Coordinates can be used to calculate mileage measurements between two rate centers that is used to determine the appropriate mileage rates in determining the charge for message telephone service calls.

Minor Vertical or Horizontal Coordinates - A five-digit number used with the Vertical Coordinates and Horizontal Coordinates to pinpoint a more specific location. The Minor Vertical and Horizontal Coordinates can be used to divide rate centers into zones for more specific distance calculations. This is most often used to rate interstate messages when straight distance between the calling and called point is less than forty miles.

Months to Exhaust - =
$$\frac{\text{TNs Available for Assignment}}{\text{Growth (Quantity of Lines added per Month)}}$$

NANP - The North American Numbering Plan is a numbering architecture in which every station in the NANP Area is identified by a unique ten-digit address consisting of a three-digit NPA code, a three digit central office code of the form NXX, and a four-digit line number of the form XXXX.

NANPA - North American Numbering Plan Administration. With divestiture, key responsibilities for coordination and administration of the North American Numbering/Dialing Plans were assigned to NANPA. These central administration functions are exercised in an impartial manner toward all industry segments while balancing the utilization of a limited resource.

NANP Area - Consists of the United States, Canada and the Caribbean countries currently in NPA code 809.

NPA - Numbering Plan Area, also called area code. An NPA is the 3-digit code that

occupies the A, B, and C positions in the 10-digit NANP format that applies throughout the NANP Area. NPAs are of the form N0/1X, where N represents the digits 2-9 and X represents any digit 0-9. After 1/1/95, NPAs will be of the form NXX. In the NANP, NPAs are classified as either geographic or non-geographic. a) Geographic NPAs are NPAs which correspond to discrete geographic areas within the NANP Area. b.) Non-geographic NPAs are NPAs that do not correspond to discrete geographic areas, but which are instead assigned for services with attributes, functionalities, or requirements that transcend specific geographic boundaries. The common examples are NPAs in the N00 format, e.g., 800.

NPAC - Number Portability Administration Center -

NPA Code Relief - NPA code relief refers to an activity that must be performed when an NPA nears exhaust of its 640 NNX or 792 NXX capacity. Relief is typically provided to an NPA about a year before its capacity is reached. NPA Code Relief for an NPA that is nearing the 640 NNX limit is usually provided in the form of implementing interchangeable central office code (ICOC) which provides an additional 152 assignable central office codes. An NPA that has been implemented as ICOC has a capacity of 792 assignable NXX central office codes. Providing code relief to such an NPA normally takes the form of assigning a new NPA for an NPA split or overlay. Another option is changing the boundary of the existing NPA.

NPA Relief Date - The date by which the NPA is introduced and routing of normal commercial traffic begins.

OCN - Operating Company Number (OCN) assignments which must uniquely identify the applicant. Relative to CO Code assignments, NECA assigned Company Codes may be used may be used as OCNs. Companies with no prior CO Code or Company Code assignments may contact NECA (201 884-8355) 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 Bellcore's Traffic Routing Administration (TRA) (908 699-6700). (See Part 1, Footnote 4)

Point of Interconnection (POI) - The physical location where a carrier's connecting circuits interconnect for the purpose of interchanging traffic on the PSTN.

Pool Administrator - Entity responsible for the administration of the NXX-X blocks within an NPA.

Premature Exhaust - (When referring to NANP): Premature exhaust means the exhaust of NANP resources (i.e., requires expansion beyond the 10-digit format) much sooner than the best industry projections. The NANP is expected to meet the

numbering needs of the telecommunications industry well into the 21st century (i.e., a minimum of 25 years). (When referring to NPA): Premature exhaust is when a specific date for NPA relief has been established and the NPA is projected to exhaust prior to that date. (When referring to Rate Center): Premature exhaust is when a specific date for NXX relief has been established and the rate center is projected to exhaust prior to that date.

Private Networks - Private networks are composed of stations which are not directly accessible from all PSTN stations via the use of NANP E.164 numbers.

PSTN - Public Switched Telephone Network. The PSTN is composed of all transmission and switching facilities and signal processors supplied and operated by all telecommunications common carriers for use by the public. Every station on the PSTN is capable of being accessed from every other station on the PSTN via the use of NANP E.164 numbers.

Rate Center - A geographically specified point used for determining mileage-dependent rates for PSTN calls.

RDBS - The Routing Data Base System (RDBS) contains a complete description of all Local Exchange Companies' networks in the NANP Area (except, currently Canada) and pertinent information relating to the networks of other code holders. This provides information for, (1) message routing, (2) common channel signaling call setup routing, and (3) operator service access routing.

Reassignment - Refers to the transfer of a working or assigned NXX from one switching entity/POI to another.

Receiving Service Provider/Switch - The service provider or switch which ports (imports) a telephone number from another switch into their switch. In a Number Pooling scenario, this service provider is assigned 1000 blocks in NXXs where they are NOT the Default Code Holder.

Reserved Blocks - A block that has been identified and set aside by the Pool Administrator for some specific use or purpose. This block is not available for assignment but neither has it been officially assigned by the Pool Administrator(s) to an entity.

Reserved Telephone Numbers - (Not yet defined by Industry)

SAC - Service Access Code - A non-geographic NPA or ERC used for the purpose of providing access to a specific type of service.

Service Providers - Any entity that is authorized, as appropriate, by local governmental, state, federal or the NANP Area governmental authorities to provide communications services to the public.

Snapback - The process of returning a ported telephone number to the code holder for re-assignment to another customer. In a Number Pooling scenario, snapback will occur to the Block Holder, not the Default Code Holder except for the 1000 block(s) the default code holder has been allocated.

Switching Entity - An electromechanical or electronic system for connecting lines to lines, lines to trunks, or trunks to trunks for the purpose of originating/terminating PSTN calls. A single switching system may handle several central office codes.

Technical Requirement - A limitation of the Point of Interconnection or Switching Entity where an existing block and/or numbers cannot be used for designated network routing and/or rating of PSTN calls.

Terminating Point Master - The TPM contains all the active NPA and CO code (NXX) combinations in the NANP and for each of these points the following is provided: Major Vertical and Horizontal coordinates, LATA/LATA-like code, LATA subzone code, RAO code, place and state, province or country name abbreviation, and time zone indicator.

TN's Available for Assignment - Telephone numbers within existing blocks (NXX-X) which are immediately available for assignment to subscriber access lines or their equivalents within a switching entity/POI.

TN's Unavailable for Assignment - Telephone numbers within existing blocks (NXX-X) which are neither "Working Telephone Numbers" as defined below, nor available for new assignments as working telephone numbers within a switching entity/POI. Examples include numbers required for maintenance testing, numbers reserved for specific customers or specific services, disconnected numbers on intercept, pending connects or disconnects, etc.

Vacant Telephone Numbers - Telephone Numbers which have been allocated to a service provider, but are not assigned to a customer, reserved, nor being aged by the service provider.

Working Telephone Numbers (TN's) - Telephone numbers within existing blocks (NXX-X) which are assigned to working subscriber access lines or their equivalents, e.g., direct inward dialing trunks, paging numbers, special services, temporary local directory numbers (TLDNs), etc., within a switching entity/POI.