4140 Clover Street
Honeoye Falls, New York 14472-9323

October 21, 1998

Kathryn C. Brown
Chief, Common Carrier Bureau
Federal Communications Commission
1919 M Street N. W.
Washington, DC 20005

Dear Ms. Brown:.

On September 23, 1998 the North American Numbering Council (NANC) forwarded to you a report of the Numbering Resource Optimization (NRO) Working Group to the NANC together with a NANC Executive Summary and Recommendation.[1] These documents were in response to a letter dated March 23, 1998, from A. Richard Metzger, Jr., the then Chief of the Common Carrier Bureau. In our transmittal letter, it was noted that while the NRO report addressed in considerable detail thousands-block and individual telephone number pooling, additional work needed to be done in a number of other areas that had been identified by the NRO. We indicated that NANC intended to complete that work and forward a final report to the Bureau on October 21,1998. That report is included with this letter. We respectfully request that the report not be used for purposes of public comment until editorial review is completed, a process that will conclude no later than 5:00 P.M. eastern time on Friday, October 23,1998.

NANC believes that there is a pressing and urgent need to implement measures to optimize the use of numbering resources in many areas of the United States. It is our hope that the report that we are hereby submitting will be a very useful tool to the Federal Communications Commission and to state regulators in achieving the important goal of conserving numbering resources and providing those resources in an efficient and fair way to the ultimate benefit of consumers.

Of the many issues examined during our work on optimization, we think two issues deserve special attention at this time: i) data concerning the cost of implementing LNP-related optimization techniques; and ii) jurisdictional issues entailed in the implementation of other optimization measures.

During the preparation of this report, the NRO sought to obtain cost data from carriers and vendors that would allow the NRO to evaluate the relative cost of the various optimization techniques. A copy of the data request form sent to carriers and vendors is attached as an appendix to the report. Perhaps understandably, some carriers and some vendors were reluctant to disclose the cost data because of concerns about the competitive sensitivity of the cost data. Due to this limitation on data collection, the NRO was unable to address the relative costs of these measures in this report.

The NRO continues to believe that this cost data is critical to a full evaluation of LNP-related optimization techniques. Therefore, we respectfully recommend that the Commission request this information from the carriers and vendors. Without taking a position on whether all the information

[1] For convenience, a copy of the NANC Executive Summary and Recommendation, dated September 23, 1998, is included with the report.

should be deemed confidential, we believe the Commission can afford the respondents who request it adequate protection of confidential data. The NANC also recommends that the Commission extend confidentiality no further than is necessary to obtain the data. It may be possible, for example, for the Commission to release publicly some or all of the data, or summaries of the data, without identifying its source. This would permit interested parties to comment on the data (and perhaps challenge its accuracy) while protecting the sensitive nature of some of the data. In contrast, if none of the data is available publicly, it will be difficult to assess the accuracy of the respondents' estimates of the cost of implementing various optimization measures.

The second issue involves the jurisdiction over non-LNP-related optimization techniques such as rate center consolidation, extended local area calling, mandatory 10-digit dialing, etc. In its recent ***Pennsylvania Order***[2], the Commission addressed the authority of state commissions to implement various conservation activities. The attached report describes techniques that may be affected by that order. Because of the urgency for progress on optimization, the NANC recommends that the Commission act quickly to resolve any uncertainty about the jurisdiction over these additional techniques. In that vein, NANC recommends that the Commission seek comment on whether some of these non-LNP-related techniques are already within the jurisdiction of state regulators and whether authority to undertake other measures should be delegated to the state regulatory commissions. We observe, for example, that some of these techniques may be able to be implemented quickly by state commissions without raising interstate issues, while others might arguably be feasible or cost-effective only if implemented on a uniform regional or national basis.

Further, the Commission should seek comment on how jurisdictional issues affect the efficacy of these techniques and how interactive effects among these techniques might affect carriers and optimization efforts. The interplay among different or inconsistent techniques, for example, may create less than optimal approaches from both cost-effectiveness and competitive perspectives.

Sincerely,

/s/

Alan C. Hasselwander
Chairman
North American Numbering Council

cc: Anna Gomez, Yog Varma, Kris Monteith, Jared Carlson, Jeannie Grimes

[2] Memorandum Opinion and Order and Order on Reconsideration on the Petition for Declaratory Ruling and Request for Expedited Action on the July, 1997 Order of the Pennsylvania Public Utility Commission Regarding Area Codes 412, 610, 215 and 717, CC Docket No. 96-98.

North American Numbering Council (NANC)
Recommendation Regarding the Report of the
Numbering Resource Optimization Working Group (NRO-WG)
SEPTEMBER 23, 1998

The Common Carrier Bureau of the FCC asked the NANC to submit a report "on national number pooling standards" that is "sufficiently detailed to support technically and operationally, a uniform, nationwide system for pooling by December 1999."[1] The Common Carrier Bureau further requested that NANC "give number conservation solutions, other than pooling, a very high priority." This report satisfies the first of these obligations. The NANC believes thousands-block pooling can be implemented in 10 to 19 months from a regulatory order, and that thousands-block pooling is the pooling option that has the greatest potential to meet the timeframe requested by the Bureau. Therefore, we recommend that the FCC focus its initial efforts on thousands-block pooling.

However, this recommendation is not intended to overlook nor prejudge the value of other pooling/optimization options to the FCC and state commissions. This recommendation takes into consideration the status of the work already in progress throughout the nation and across many other groups (e.g., NANC's LNPA-WG, the INC, Committee T1 and various individual state regulatory agencies). It is based on a compilation of the best available information and the informed opinions on a method of pooling that might be implemented by December 1999.[2] The forms of number pooling identified by this WG can only be implemented by carriers that have deployed LRN in the areas where LNP is available.

So that thousands-block pooling can be implemented on a timely and expeditious basis, NANC respectfully recommends that the FCC issue an order to trigger the implementation timeline. NANC also strongly recommends that this order clarify how cost allocation and cost recovery will be accomplished.

In support of this recommendation, the FCC should note that thousands-block pooling has been studied extensively by the NRO-WG and its Task Forces as well as the Industry Numbering Committee (INC). Thousands-block assignment Guidelines have been prepared by INC.

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[1] See Appendix A

[2] The dates provided as projections for the completion of thousands-block pooling by December 1999, assume that all the milestones will be completed.

Standards are in the process of development by T1S1.6.[3] Trials are taking place in two states. The NANC recognizes these efforts and will forward output from these efforts to aid the FCC in its decisions.

The ITN Task Force selected an architecture for ITN pooling. Additional work is required such as the development of requirements, guidelines and standards. The timeline included in this report suggests a four to six year schedule. Consequently, ITN pooling does not meet the criteria as outlined in the Common Carrier Bureau letter, i.e., deployable by December 1999.

There are several other optimization methods that may be used individually, combined with other options or used with a type of pooling of numbers. These are listed in the report summary and will be part of the final report to the FCC in October 1998.

Implementation of some of these optimization methods might not entail intensive industry or regulatory effort. Some of these options might be deployable prior to December 1999, independently or in combination, as befitting the unique circumstances in a given state or NPA.

[3] It should be noted that the INC Thousands-Block Pooling Administration Guidelines were offered to NANC in September and that all key INC agreements have already been reviewed and accepted by NANC. The T1S1.6 has begun work on number pooling and expects to have completed a set of requirements by the end of 1998. They would then be ready to go out for letter ballot with voting in 1Q99. Supplier information must still be obtained concerning the point in the requirements process at which they will be willing to start development.

North American Numbering Council (NANC)
Executive Summary of the Report of the
Numbering Resource Optimization Working Group (NRO-WG)
SEPTEMBER 23, 1998

In a letter dated March 23, 1998, the Common Carrier Bureau asked the NANC to provide a report "sufficiently detailed to support, both technically and operationally, a uniform, nationwide system for pooling by December 1999. It would also be helpful to the Bureau if the NANC would give number conservation solutions, other than pooling, a very high priority." In response, the NANC created the NRO-WG. The purpose of the NRO-WG is to assess and recommend strategies that ensure adequate and competitively neutral availability of numbering resources to all end users and service providers while optimizing the use of numbering resources. These strategies should be technically feasible, practical and should minimize costs to all.

The task for the NRO-WG was to develop a report to the NANC. In preparing the report, the NRO-WG was to coordinate with other industry fora, collaborate with state commissions, and collect the necessary data to evaluate number optimization alternatives.

The NRO-WG identified 14 alternatives that potentially could increase the efficiency of the use of numbering resources. The NRO-WG subsequently created three task forces to address specific tasks:

State Issues Task Force (SITF)
Individual Telephone Number Task Force (ITN TF)
Analysis Task Force (ATF)

The State Issues Task Force was charged with providing clarification regarding the needs and preferences of state regulatory bodies in the area of number resource optimization. Specifically the SITF was charged with surveying individual states regarding the NRO-WG's identified optimization techniques. The SITF was also charged with developing a model data request for use by state commissions for obtaining number utilization data from service providers.

Two of the alternatives -- Individual Telephone Number pooling (ITN pooling) and Unassigned Number Porting (UNP) -- were directed by the NRO-WG to the ITN TF for more detailed analysis. The ITN TF was tasked with conducting a detailed analysis of ITN pooling, including the selection of an architecture, as well as an analysis of UNP. The ITN TF addressed ITN pooling in significant detail, but due to time constraints has not finished its analysis of UNP. The UNP analysis is expected to be done by early October 1998, and will be submitted by the NRO-WG to the NANC at that time to complete the report.

The ATF was charged with identifying common criteria, gathering data and analyzing data based on the set of common criteria as they apply to the NRO-WG identified optimization measures. The NRO-WG specifically assigned thousands-block pooling for analysis. That analysis is complete and contained herein. Analysis of the remaining 11 alternatives is underway but is not ready for inclusion. It is, however, expected to be finished by early October and will also be submitted by the NRO-WG at that time to complete the report.

The SITF reported that states recognize the importance of national guidelines, but seek the flexibility to require carriers to make the most efficient use of a limited and important public resource. States also responded that they will support the efforts of the NRO-WG, NANC and FCC should they lead to reasonable number resource optimization guidelines and prefer that they be detailed and include supporting rationale. The states' goal is more efficient use of numbering resources.

No one state has experience with all the optimization measures but, together, they have tested or implemented many of them. Specifically, they have first-hand experience with rate center consolidation, overlays, splits, extended local calling areas, inconsistent rate centers, elimination of protected NXX codes, thousands-block number pooling, code sharing, and altering the CO Code assignment guidelines in jeopardy situations. Some have performed studies on individual telephone number pooling and thousands-block pooling.

The SITF proposed a standardized state data request format to aid in the collection of data from service providers. The data request format offered, when combined with utilization data, will allow the states to make informed decisions about NPA relief. While the SITF recognizes that the needs of each state are unique, and decisions about what measures to implement are best left to the appropriate regulators, utilization and forecasting of NXX codes in high growth areas can assist with difficult NPA relief and planning decisions in the immediate future.

The NRO-WG and its task forces sought to assess qualitative and quantitative benefits of number pooling alternatives. Although potential qualitative benefits of thousands-block and ITN pooling are identified, there was insufficient data available to measure or predict quantitative benefits. In addition, an attempt was made to assess costs associated with the pooling alternatives. The ATF distributed cost questionnaires to service providers, vendors, and end users, and summarized the responses in an attachment to this report. Given the low response rate to the questions, few if any conclusions can be drawn from the data and, as such, the responses are provided for informational purposes only.

Of the two number pooling alternatives addressed, the NRO-WG concluded that thousands-block pooling could be implemented in a significantly shorter time-frame. As LRN-LNP is implemented, it is estimated that thousands-block pooling could be initially implemented sometime within 10 to 19 months after a regulatory order, and ITN pooling would require four to six years. Some components of the pooling timelines require regulatory guidance. It should also be noted that these implementation timeframes are dependent upon the availability of the required hardware/software changes from vendors.

Based on the work of the NRO-WG to date, as documented in this report, thousands-block pooling is the only number pooling alternative that potentially meets the FCC's December 1999 date for deployment of number pooling in LNP areas in accordance with a consistent nationwide plan. Many of the additional number resource optimization methods that the NRO-WG has yet to address in detail should provide the industry and regulators with number optimization results that are valuable and warrant their future use either individually, or in combination. While the NRO-WG recognizes the importance of cost/benefit analysis, this analysis has not been fully addressed

in this report. Further, the important issues of cost allocation and cost recovery remain to be addressed by regulators.

NUMBER RESOURCE OPTIMIZATION

WORKING GROUP

MODIFIED REPORT TO THE NORTH AMERICAN NUMBERING COUNCIL

ON

NUMBER OPTIMIZATION METHODS

DATED OCTOBER 20 , 1998

TABLE OF CONTENTS

EXECUTIVE SUMMARY OF THE NRO-WG OCTOBER 20, 1998

The NRO-WG (Numbering Resource Optimization Working Group) has completed its review of the remaining 12 optimization methods as requested by NANC. These methods were reviewed and the text was modified to reflect agreement at the NRO and/or task force level. The NRO-WG and its task forces sought to assess qualitative and quantitative benefits of the remaining optimization methods. Although potential qualitative benefits were identified, there was insufficient data available to measure or predict quantitative benefits. The ATF distributed cost questionnaires to Service Providers (SPs), vendors, and end users, and summarized the responses in the attachments to this Report. Given the low response rate to the questionnaires, few if any conclusions can be drawn from the data and, as such, the responses are provided for information only.

Following is a brief description of the 12 optimization methods discussed in this report, including Thousands Block and Individual Telephone Number Pooling.

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	METHOD	DEFINITION	ESTIMATED IMPLEMENTATION TIME FRAME	CONDITIONS WHICH MAXIMIZE BENEFITS
1)	Rate Center Consolidation	The combination of two or more contiguous rate centers into one rate center.	Four months to two and one-half years, depending on the circumstances of the area	Rate centers with identical local calling areas Significant quantity of assigned NXXs that have not been activated
2)	Extended Local Calling	The ability for CMRS carriers to extend inbound calling over a wider geographic area, typically a LATA.	Already exists in some states. 6 to 24 months for new implementation.	Large number of rate areas in ELCA area Maximum number of wireline SPs offering same ELCA arrangement in area
3)	Inconsistent Rate Centers	The ability for an SP to draw rate center boundaries different than the incumbent and/or other SPs in the LATA	Following regulatory approval, may be implemented based either on effective date in the LERG or timeline agreed upon by SPs.	Minimum number of IRC arrangements with maximum SP participation IRC areas encompass existing rate areas in entirety
4)	Individual Telephone Number Pooling	The allocation of individual TNs from a common pool(s) by a neutral administrator using LRN LNP	4-6 years depending on timing of regulatory mandate.	Maximum SP participation Maximum LNP deployment Availability of SCP capacity solution.
5)	Thousands Block Number Pooling	The allocation of TNs in blocks of 1000 from a common pool(s)	4Q99 – 2Q00	Maximum SP participation Maximum LNP deployment

		by a neutral administrator using LRN LNP.		Availability of EDR (Efficient Data Representation)
6)	Unassigned Number Porting	The transfer of TN(s) from one SP's inventory to another SP under the direction of a neutral coordinator, using LRN LNP	Planning work could begin 9-16 months prior to an NPA specific order. An additional 8-14 months may be required for the initial implementation in a region.	Maximum LNP deployment Maximum SP participation. Implementation in place for a significant period of time prior to NPA relief.
7)	Location Portability	The ability for a customer to retain a number when moving to another location outside the original rate area,	Similar to if not longer than LNP implementation.	Maximum SP participation Large number of Rate areas in location portability area.
8)	NXX Code Sharing	Division of an NXX Code among two or more SPs using 7 Digit routing in switches	Did Not evaluate	Did Not Evaluate
9)	Code Sharing Using Route Indexing	Division of an NXX Code among multiple SPs using the Route Indexing form of Interim LNP	Did Not Evaluate	Did Not Evaluate
10)	Mandatory 10 Digit Dialing[1]	The requirement that all calls in the North American Numbering Plan, whether local or long distance, be dialed using the 3 digit area code and 7 digit phone number.	Up to 12 months for 10D dialing. Multiple years if "0 / 1" are opened in the "D" Digit	Areas with many protected codes. Areas with a mix of 7 and 10 Digit local dialing.
11)	Modification of CO Code Assignment Guidelines	Proposed changes to CO code guidelines that help to ensure	Did Not Evaluate	Did Not Evaluate

[1] This plan is distinct from Overlay NPA's because it assumes that the user would dial 10 digits whether or not an overlay area code was in place. Although current standards mandate 10 digit dialing for Overlay NPA's, 10 digit dialing is not required for others.

		prudent use of NANP resources.		
12)	All Services Overlays	Addition of a new NPA serving the same geographic area as the existing NPA	6-18 months for initial implementation. 4-6 months for subsequent implementations	Where frequent NPA relief is anticipated For exhausting NPA with small geographic area.
12.1)	Retroactive Overlay	Consolidation of 2 or more NPAs by elimination of a previous split boundary	Same as All Services Overlay	Same as All Services Overlay
12.2)	Expanded Overlay	Creation of an overlay based on BTA (Basic Trading Area) or MTA (Metropolitan Trading Area), not on existing NPA boundaries	Uncertain due to lack of experience	Same as All Services Overlay
12.3)	Specialized Overlay	Creation of an overlay for SPs who fail to meet or are exempt from specific technical requirements.	Same as All Services Overlay if only applied to new SPs. Much longer period if existing customers are moved to specialized overlay	SPs that are in specialized overlay are expected to remain there for a significant period of time Competition is not expected between SPs in specialized overlays and those in existing NPA.
13)	Reduced Demand for TNs	Did Not Evaluate	Did Not Evaluate	Did Not Evaluate
14)	Geographic Splits	The division of an NPA area into multiple areas, each served by its own NPA	12-18 months, could be reduced under extreme circumstances	Comparable lives of new and old NPAs. Splits are along easily identifiable boundaries Splits do not divide rate areas. Larger geographic area of exhausting NPA

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While all of these methods allow for individual implementation, the NRO concludes that to achieve maximum number resource optimization, it may be necessary to implement multiple options in a given area. The optimum mix of alternatives is dependent upon a number of variables, which may be unique to each geographic area and the SPs within these individual areas.

Further analysis is necessary to provide specific cost and service impacts as well as information regarding combinations of measures which would achieve the most desirable result.

ANALYIS TASK FORCE REPORT

EXECUTIVE SUMMARY

Background: Mission and Scope of the Analysis Task Force

The mission of the Analysis Task Force (ATF), as stated in the May 11, 1998 NRO-WG meeting and as discussed during the June 22, 1998 NRO-WG meeting and during the June 25, 1998 ATF meeting is: ". . .to identify common criteria, gather data, and analyze data based on the set of common criteria as they apply to number optimization measures." It is the understanding of the ATF that it should:

- Develop criteria to apply to number optimization measures (whether the measures be analyzed by the ATF or the ITN);
- Collect information relevant to number optimization measures; and
- Analyze the number optimization measures using the information collected and the criteria developed, identifying the advantages and disadvantages of the measures.

Introduction

Role of the NXX in the North American Numbering Plan

The telephone numbering system used in North American countries is defined by the North American Numbering Plan (NANP). This Plan defines a 10-digit telephone number format of NPA-NXX-XXXX. The NPA (Numbering Plan Area) is more commonly known as the area code. In the NPA format, the first digit carries a value of two through nine. The remaining digits may have a value of zero through nine. The NXX identifies the central office (CO) switch or CO code to which the XXXX or line number is assigned. In the NXX and XXXX, N can be any digit from 2 through 9, and X any digit from 0 through 9. Taken together, the NPA-NXX code combination is used to route calls within the public switched telephone network to line numbers on specific switches.

The NPA-NXX also performs a second function known as "call rating." Each NPA-NXX is associated with a specific geographic area within an NPA and is assigned horizontal and vertical coordinates (V and H coordinates). These coordinates are used to determine the distance of a call between geographic locations of the originating and terminating numbers. A group of NXXs that have the same V & H coordinates form a rate center. Historically, the distance, length of call, and time of day have been used to determine the price of the call. Such rating is done in real-time on operator-assisted calls.

The NPA-NXX performs a third function. Historically, end users could distinguish between local calls and toll calls by looking in the front of the telephone directory for the

list of NXXs that defined a given local calling area. Today, when a call is originated by a subscriber who has selected an interexchange carrier for intraLATA toll calls, the originating switch uses the NPA-NXXs of the originating and terminating numbers to determine, in real-time, whether the call is to be routed by the Local Service Provider (LSP) to the presubscribed interexchange carrier. This function is commonly called "toll discrimination."

Finally, the NPA-NXX has been the basis for certain specialized wireless and wireline services. In this scenario, specific NPA-NXXs are utilized to identify and differentiate services such as Calling Party Pays, Wide Area Calling Plans, Uniform Access Dialing, Toll Free, Information provider (e.g., 900, 976), and others.

Minority opinions on the subject of Unassigned Number Porting (UNP), one coauthored by GTE and WinStar and another by MCI, are included following the section of this Report which describes UNP.

PART A: MEASURES THAT AFFECT LOCAL CALLING

1 Consolidation of Existing Rate Centers

1.1 Description

The Consolidation of Existing Rate Centers[2] (also known as "Rate Center Consolidation," or “RCC”) proposal suggests that the number of rate centers could be reduced by combining or collapsing several existing rate centers into fewer rate centers. This proposal maintains both the current call-routing and call-rating methods. The Rate Center Consolidation proposal assumes that an NPA/NXX code need not be used to identify more than one switch. Accordingly, carriers that have more than one switch in a (consolidated) rate center can still be assigned NPA/NXX codes, at a switch level.

Rate Centers were originally established in response to a need for a fixed point within each exchange that would ensure consistent mileage measurements between exchanges and, therefore, consistent billing for long distance services. Call rating is typically affected by real-time and downstream processes supported by each service provider. These processes rely upon knowledge of the calling and called party locations to determine whether the call is local or toll, and to compute the specific charge. The calling and called party locations are associated with the NPA-NXX of calling and called party number. Numbering assignment guidelines for companies choosing to perform call rating consistent with the traditional ILEC rate center configuration require the assignment of one CO (Central Office)/NXX code per rate center. In addition, it appears that for LNP to conform to current industry agreements, the porting to and porting from SPs should share the same rating area.

Consolidation of Existing Rate Centers is an alternative designed to minimize the demand for NXX codes within an NPA by reducing the number of rate areas in a given LATA. Implications emerging from the implementation of RCC will vary depending upon the existing rate center structure within a particular geographic area, and should be weighed carefully before RCC is undertaken in a particular Number Plan Area (“NPA” or Area Code) or geographic area. The impacts resulting from RCC, which are described in this document, are dependent primarily upon the extent to which customers' local calling areas are affected.

RCC alternatives can be categorized as follows:

- Consolidation of rate centers without affecting local calling scopes
- Consolidation of rate centers affecting local calling scopes

[2] Also applies to sub section of rate districts or rate areas.

To date, several states have studied or implemented the consolidation of rate centers with different results, which tends to suggest that the measure is not an optimal solution in all situations. This document provides the result of work in these selected states on both options, including the potential impact on rates. Texas (RCC-TX) has implemented RCC without affecting exchange calling scopes, and did not increase rates or create customer confusion or a need for customer education. Colorado's consolidation (RCC-CO) depicts RCC where calling scopes were affected. There there was a modest rate increase and some customer confusion. On the other hand, the Bell Atlantic-New Jersey RCC Study (NJ Study) and comments of Bell Atlantic-Pennsylvania in a state filing, concluded that RCC would have significant impacts on local calling scopes, rates, customer confusion and customer education.

This alternative does not address nor preclude consideration of any other optimization alternatives (e.g., Inconsistent Rate Centers, ELCA, etc.) Rather, it focuses exclusively on the consolidation of those rate centers historically used by Incumbent Wireline SPs.

1.2 Additional Assumptions:

- Local calling plan consolidations and / or changes may be required to permit rate center consolidation to have the desired effect.
- SPs which have multiple switches serving a consolidated rate center will be permitted to assign NXX codes on a "per switch" basis.
- Commercial Mobile Radio Service (CMRS) provider local calling areas differ significantly from wireline local calling areas.
- Wireline local SPs within the area of consolidation will conform to the new rate center boundaries.

1.3 Implementation Timeline

- The specific time required for implementation will be dependent upon the complexity of the existing rate center structure, the time to study that structure and understand the implications of the various RCC options, as well as the extent of changes made to that structure and associated network elements in order to accommodate RCC. The time needed to implement RCC will also be affected by regulatory approval of rate restructuring, when applicable.
- RCC does not require national agreement for implementation and may be implemented, following regulatory consent, on a state, NPA or individual rate center basis. Since RCC has been implemented in some states, lessons learned from states that have implemented this measure can be useful in those areas investigating the option. Additional information about the State implementations can be found in the State Issues Task Force report.

Once state regulatory approval is granted, the physical and administrative work required to achieve RCC will range from as short as four months to as long as two and one-half

years to complete. Studies and actual experience in deployment of RCC in various states support this timeframe.[3] This range of time frames is also supported by the SP Cost Questionnaire responses. (See Cost Questionnaire at Attachment 11.)

1.4 Cost Estimation

Similar to the implementation timeline described above, the cost of RCC is subject to a number of variables unique to each geographical area and service provider. The ATF issued a cost questionnaire to further capture and analyze implementation cost information from End Users, Service Providers and Industry Suppliers. Aggregated results have been analyzed and can be found in Attachment 11. It has been difficult to identify an overall cost that is applicable in all areas.

1.4.1 Service Providers

Costs to implement RCC will vary significantly depending on the scope of the RCC option implemented. In Texas, the costs to SPs was sufficiently small that cost recovery was not addressed. In more complex RCC options, costs to service providers have been estimated to be as high as $20 Million (NJ Study), and cost recovery plans would likely be required.

- Smart Pay phones may need to be reprogrammed.
- End User equipment (e.g., PBX Call Accounting Systems) may need to be reprogrammed.

1.4.2 End User of Telecommunications Services

- In areas which have wide local calling areas, the impact on customers, if any, is minimal. For instance, in Texas, the implemented RCC option has resulted in no discernible shift in toll revenue.
- Depending on the area where it is implemented, RCC may increase the size of local calling areas, and hence rates, and may have a similar effect on extended calling plans.
- If an expansion of local calling areas occurs, it may reduce the number of toll calls handled by SP's. The total revenue loss and/or expense change may be recovered from basic service rates using a percentage increase across all customers. Thus, a larger percentage of the revenue may derive from basic service and a lesser percentage from toll service than before RCC is implemented. Thus, a customer

[3] The RCC-TX implementation took four months. The Bell Atlantic estimate for New Jersey is approximately two-and-one-half years after commission approval. Similar to New Jersey, Bell Atlantic-Pennsylvania, (BA-PA) expects that it would need two to two-and-one-half years to implement even limited rate center consolidation in it service territory after Commission of a consolidation plan and associated revenue-neutral rate changes. RCC was implemented in Dallas, Houston, Austin, Fort Worth, and San Antonio, Texas within four months of regulatory approval for rate centers with common local calling scopes. Southwestern Bell has consolidated 108 rate centers to 31 with no changes in local calling scopes and no customer confusion/education.

that makes primarily local calls could see an increase in total charges while one that makes primarily toll calls could see a decrease. For more details, see the NJ Study[4] and the Colorado Study[5].

- Responses to the end user cost questionnaire indicated that there would be costs to reprogram customer provided equipment ("CPE") (e.g. Least Cost Routing Tables, etc.).
- Customer Specific Pricing Contracts may need to be re-negotiated as a result of a change in rate centers. (See NJ Study referenced above.)

1.5 Benefits of Measure

1.5.1 Qualitative

- Where implemented, RCC can be used as an NXX optimization measure to delay the exhaust of NPAs and future jeopardy situations. For example, the proposed RCC option implemented in the 210 NPA (San Antonio, Texas) reduces the number of rate centers from 29 to 1. This consolidation is estimated to result in the extension of the life of the existing 210 NPA by two years. Depending on the complexity of work involved with the implementation of RCC, it may alleviate some of the impact of an existing jeopardy situation. However, where jeopardies currently exist, RCC may not eliminate the immediate need for NPA relief. In New Jersey, the study concluded that if consolidation were realized by early 1999, code life on average, may only extend by less than one half year for the 201, 908, 973 and 732 area codes. The benefits are realized over time and can be maximized in areas that are planning to, or have just undergone NPA relief, as demonstrated in Texas with implementation of RCC in the 210 NPA.
- This alternative may permit a reduction in the number of wireless-wireline points of interconnection.

1.5.2 Quantitative

- RCC may reduce the demand for new NXX's. The total reduction is dependent on SP demand and on the actual reduction in the number of rate centers.
- Wireless providers specifically request as many NXXs as are required to permit wireless customers to be called by wireline customers on a local basis. Thus, wireless NXX demand should be reduced as a result of RCC implementations where the local calling scope is increased.

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[4] NJ Study

[5] Colorado Study

1.6 Technical Considerations:

1.6.1 Switch/OSS Development and Administration

The Switch/OSS impacts are dependent on the scope of RCC and the level of changes to local calling plans and rates. Not all of the impacts will apply to all RCCs. The following list is not all-inclusive.

- Creation of new rate center areas requires new data entries in all industry and service provider databases/tables that use rate centers in their processes including switch translations.
- Billing systems may require modifications.
- Modifications to customer contact operational support systems (e.g., Business Office) may be required.
- Modifications to coin service equipment may be required.
- Network changes may be required (e.g., trunking rearrangements, including operator services trunks, local dialing plan, toll recording equipment). This depends upon the RCC option chosen.

1.6.2 Network Reliability

No reliability concerns unique to RCC have been identified.

1.7 Impact On Competition:

1.7.1 Equal Availability of Numbers

- This method provides continued equal availability of future assignable NXXs to all industry segments.
- SP embedded base of previously assigned NXXs will not be affected by implementation of RCC.

1.7.2 Implementation Impacts (Out-of-area, by all, disproportionate)

1.7.2.1 Out-of-Area

- Other SPs may need to change billing system data to reflect new rate centers. [2]
- Other SPs' individual toll rates between points may change. This only applies to toll providers using distance sensitive rating.
- Naming conventions of localities on bills may change. This may cause some customer confusion.

1.7.2.2 Impact if Not Uniformly Implemented By All Service Providers

- As described here, this alternative assumes that all carriers will conform to the new rate center boundaries. Thus, no impacts have been identified.

1.7.2.3 Disproportionate

- The incumbent local exchange carrier (ILEC) industry segment believes that it will bear a higher proportion of the impact on revenue, costs of implementing the changes in embedded support systems and associated network rearrangements than other industry segments.
- For those areas where RCC results in larger local calling areas, competitive local toll providers will see a reduction in the amount of Intra-LATA traffic which is available for competition. This may result in lost revenue.

1.8 Consumer Issues:

1.8.1 Users/Services Impacts

- The basic concept of local calling using a select set of NPA-NXXs is maintained; size of local area, toll boundaries, and/or mileage between rate center may change. As a result of these changes, rate group re-classification may need to be performed, services billed on a distance sensitive basis could change, and customer-specific pricing contracts may need to be renegotiated.

  For example, the Bell Atlantic New Jersey Study concluded that more than $80 million in toll, foreign exchange ("FX"), private line and public coin revenues would need to be shifted to and recovered from local service as local calling areas would be expanded. The actual implementation cost will not be known unless and until the implementation occurs. However, in Texas because RCC involved only metropolitan rate centers with the same local calling scope, there were no explicit changes in end user local calling rates.
- CPE changes may be necessary to accommodate changes in rates or dialing plans. (e.g., Automatic Route Selection, Call Detail Recording, "Smart" Pay Phones).
- Customer confusion may occur, and customer education may be needed as a result of changes in local calling areas, rate center names and charges on customer bills.
- End user satisfaction may increase due to larger local calling areas.

1.8.2 Dialing Changes

- RCC does not require changes in customer's dialing patterns for consolidation of rate centers with the same local calling areas.

- In areas where a "1" prefix is used as a toll indicator, RCC may have an impact on the local dialing plan. If consolidation encompasses areas that previously were treated as toll, at a minimum systems would need to be reprogrammed to allow dialing without the “1” prefix.

1.9 Public Safety Issues

1.9.1 E911

Impacts on E911 must be studied and understood before RCC can be implemented. Constructive interaction between serving carriers and Public Safety Answering Point (PSAP) operators must be undertaken in order to realize the maximum advantages of rate center consolidation. For example:

- Consideration must be given to the routing of 911 calls before approval of any RCC plan. Default routing of 911 calls is NXX driven. Therefore, not all 911 calls from each rate center being considered for consolidation may be routed through the same ILEC tandems, switches or the PSAPs. Involvement of the 911 community is essential when determining the impact RCC will have on the routing of 911 calls and how roadblocks can be eliminated cost-effectively without any disruption of service.
- Because PSAP regions fall within the jurisdiction of state/local regulatory authorities, the impact will vary by jurisdiction.
- PSAP provider participation in rate center consolidation activities, although voluntary, is essential. PSAPs should be involved in the RCC process from the outset.
- Modifications for E911 default routing may be required. Modifications to 911 tandems may be required as well.
- Subsequent splitting of E911 tandem boundaries to provide capacity relief will be more complex.
- The benefits of RCC may be reduced if some E911 routing service specifications continue to require an NXX per PSAP service area.

1.10 Other Considerations

- Although RCC reduces future demand for NXXs, it may not supply any additional NXXs, nor does it allow for sharing of previously assigned NXX codes between service providers. It will allow for more efficient utilization of numbers from existing and future assigned NXXs; however, the degree of efficiency realized is dependent upon the reduction in the number of existing rate centers and the number of service providers within each area being consolidated.

- RCC consolidation across NPA boundaries will not supply maximum benefit of rate center consolidation.
- If NPA boundaries continue to maintain the integrity of rate center boundaries, RCC will reduce the number of alternatives available in drawing split boundaries because there will be fewer rate center boundaries from which to choose.
- RCC does not require LNP-LRN to implement.
- A process for determining the new V&H coordinates of consolidated rate centers needs to be devised. In Texas, the V&H coordinate for the main central office location of the metropolitan exchange was used.

1.10.1 Regulatory/Jurisdictional Considerations

- Changes in the common rate center boundaries used by all Local Service Providers can only be implemented with regulatory consent.
- Implications emerging from the implementation of RCC will vary depending upon the existing rate center structure within a particular area. Such implications should be examined and considered before RCC is undertaken in a particular NPA or geographic area.
- A detailed regulatory study, including cost/benefit analysis and any revenue/cost changes, should be undertaken for each consolidation effort under review.
- Revisions may be required to Exchange Area Tariffs and Exchange Area Maps for all RCC changes.

1.10.2 Conditions under Which Benefits Could Be Maximized

- Consolidation of Contiguous Rate Centers with identical calling areas, both optional and mandatory, and identical exchange rates could be implemented in the least amount of time and could have a minimal impact on end users.
- RCC can reduce code requirements in areas where new entrants have NXX assignments but service has not yet been activated. Deactivated codes could be recovered for reassignment, but would require voluntary return of inactivated codes. As a result of the initial RCC in Texas, 77 codes were returned in five NPAs for future use by other SPs.

2 Extended Local Calling Area (ELCA)

2.1 Description:

ELCAs, also known as "reverse toll," "LATA-wide calling plans," or the "land-to-mobile option", which, to date, have been offered to CMRS (Commercial Mobile Radiotelephone Service) providers by many Local Exchange Carriers (LECs) in numerous jurisdictions since the late 1980s. ELCAs are technical arrangements that permit wireline callers from a

pre-determined, fixed, geographic area, typically a LATA, to call CMRS end-users anywhere in that geographic calling area without a toll charge. The wireline provider differentiates and treats calls to ELCA end-users by unique ELCA NXXs. Thus, existing dialing, routing and operational systems' conventions remain intact. The CMRS carrier usually pays the wireline carrier a negotiated per minute rate for this service. LECs record this usage at the wireline calling party's end-offices. At the end of the billing period, usage for all end offices within the ELCA is aggregated and a bill is rendered to the CMRS provider.

Interconnection between the CMRS provider and the serving LEC for ELCA service is generally facilitated at the access tandem. However, there is no technical reason why the interconnection cannot be done at the LEC end office or other point of interface.

Under ELCA arrangements CRMS carriers can assign numbers from a single NXX to the entire ELCA geographic area. Therefore, CMRS carriers who elect to utilize ELCAs as their sole interconnection arrangement require only as many NXX codes as necessary on a LATA, or other large geographic area-wide basis to serve their customers. Use of non-ELCA codes would continue to be at the discretion of the CMRS provider.

In order to make ELCAs attractive to ELCA service provider customers and, to avoid potentially adverse end user impacts, it is highly desirable that all local exchange carriers in the ELCA service area provide the ELCA option. Past experience with ELCAs has shown that regulatory intervention is sometimes necessary to ensure ubiquitous availability of ELCA in a given ELCA service area.

To date ELCAs have been deployed between wireline SPs and CMRS providers. However, nothing precludes wireline to wireline SP participation in ELCAs. The arrangement between wireline SPs has not been studied in detail. The remainder of this section describes wireless to wireline ELCAs. Known details are included for the wireline to wireline alternative.

2.2 Additional Assumptions:

- Tariff or contracts must be developed by the LEC to offer ELCAs. Regulatory approval is generally required.
- ELCAs will not be the sole form of interconnection available to CMRS providers in a given geographic area.
- Unless the “ported to” and “ported from” SPs have the same ELCA area, LNP implementation will necessitate modifications to the ELCA architecture. These modifications have yet to be defined.

2.3 Timelines for Implementation:

ELCAs, as they currently exist, have been deployed in multiple jurisdictions using a variety of technological capabilities and business arrangements since the 1980s. Assuming CMRS providers are required to provide LNP to their subscribers, or wireline carriers subject to

LNP requirements utilize ELCAs, it will be necessary to modify ELCA-enabling technology. It is believed that these modifications will rely upon the planned LNP infrastructure and should be able to be completed prior to the introduction of wireless number portability.

Although only a few SPs responded to a question that the ATF posed regarding ELCA implementation intervals, it is believed that the six to twenty-four month interval suggested by these respondents is reasonable for additional implementation of wireline to wireless ELCA. This interval would include completion of such tasks as:

- a detailed study of calling patterns;
- development and approval of tariffs;
- modification to LEC billing systems;
- potential modification to switch routing tables.

2.4 Cost Estimation:

Similar to the implementation timeline described above, the costs of ELCA are subject to a number of variables unique to each geographical area and service provider. The ATF issued a cost questionnaire to further capture and analyze implementation cost information from End Users, Service Providers and Industry Suppliers. Aggregated results have been analyzed and can be found in Attachment 12. It has been difficult to identify an overall cost that is applicable in all areas.

2.4.1 Service Provider

Current ELCA architectures require the participating wireline SPs to individually identify, record and bill those NXXs associated with this service. The cost to enable this capability has historically been recovered via ELCA-related usage rates described below.

Wireless SPs who elect the ELCA option are typically billed an incremental, per minute, usage charge for wireline calls made to their end-user customers. This charge is usually aggregated on a per-carrier basis and billed monthly by the participating wireline SP to the wireless SP. It has been determined that there may be little or no implementation cost to the wireless ELCA SP.

Costs associated with modifying ELCAs to exist in an environment where the ELCA service has been modified to support wireless LNP have not been quantified.

2.4.2 End-User

Wireless end-users who choose the ELCA option may be charged a premium flat or higher usage rate by their CMRS SP for the ability to receive calls that do not invoke toll charges for the wireline calling party. There is usually not an ELCA-specific implementation or activation cost.

Wireline calling parties materially benefit from the ability to call wireless ELCA end-users anywhere within a large, geographic area without a toll or ELCA-related service charge. The ELCA-associated cost saving to wireline callers varies based on individual end-user calling patterns.

2.5 Benefits of Measure

2.5.1 Qualitative:

Instead of requesting NXXs from multiple rate centers, a CMRS SP could elect to serve a large geographic area, typically an entire LATA, with one NXX spread across the entire area, rather than multiple (as many as 50 or 60) NXX's to serve each rate area.

Other entities, for instance wireline SPs, may also utilize ELCAs, assuming state regulatory approval and willingness of Local Exchange Carriers to provide ELCAs. As more entities participate in ELCAs, the potential number optimization benefits increase. However, since wireline LNP is already being implemented, the ELCA service and/or LNP must be modified prior to ELCA use by wireline SPs. In addition, since wireline users do not normally pay for the receipt of calls it is unclear whether this is a viable option for wireline networks.

Cellular, broadband PCS, and some Specialized Mobile Radio (SMR) CMRS providers must begin LNP deployment on March 31, 2000. Other CMRS entities, notably paging and narrowband entities, are exempt from LNP mandates. In addition, most CMRS providers support an extension to or forebearance from this deadline. ELCAs can provide significant benefit before and after CMRS LNP implementation and would also permit all CMRS and ELCA participating SPs to positively contribute to efficient use of numbering resources when and where they do not participate in LNP.

ELCAs do not contradict any existing federal mandate. In fact, ELCAs permit CMRS providers to efficiently serve their customers while meeting FCC requirements to "reliably serve" their coverage areas.

2.5.2 Quantitative:

Every geographic location in the United States is covered by at least seven CMRS two-way licenses. In addition, thousands of paging and narrowband SPs offer services that require assignment of telephone numbers to end-users or terminal equipment. ELCAs permit CMRS providers to serve a large geographic area, rather than a much smaller area, with the same NXX code.

2.6 Technical Considerations:

2.6.1 Switch/OSS Development and Administration

As noted, ELCAs have been provided since the late 1980's in multiple areas, each with its own diverse technical characteristics. However for carriers with no prior ELCA

experience, switch routing and rating tables may need to be modified to support calls into ELCAs. In addition, SPs' billing and rating systems may require modifications to accommodate unique billing arrangements offered to wireless carriers under an ELCA plan.

Finally, it will be necessary for both the serving LEC and CMRS provider to add capabilities to preserve ELCAs after wireless LNP is deployed. These modifications have yet to be defined.

2.6.2 Network Reliability

Many LEC and CMRS providers have participated in ELCAs for over ten years. No network reliability concerns have been associated with ELCAs during this time. Modifications to support ELCAs in a after deployment of wireless LNP must ensure network reliability.

2.7 Impact on Competition

2.7.1 Equal Availability of Numbers

This method helps conserve NXXs by minimizing the need for wireless SPs to obtain multiple NXXs to cover their service area. As such it may ensure greater availability of future assignable NXXs to all industry segments.

2.7.2 Implementation Impacts (Out-of-area, by all, disproportionate)

2.7.2.1 Out of Area

None identified.

2.7.2.2 If Not Uniformly Implemented By All Service Providers

In areas where LEC ELCA availability is not ubiquitous, customer confusion and complaints increase because wireline callers believe all calls to ELCA numbers should be free, regardless of the wireline dial tone provider. Indeed, many CMRS providers will not offer ELCA service unless all SPs in the geographic area offer ELCAs.

The service is most effective if all SPs within an ELCA area provide the capability.

2.7.2.3 Disproportionate

To date most of the cost benefits of ELCAs appear to acccrue to wireline customers calling wireless subscribers participating in ELCA plans.

ELCAs could reduce the amount of wireline intra-LATA toll or other non-local service revenue. However, wireline SPs may be able to recover these revenues through ELCA usage rates paid by CMRS providers.

2.8 Consumer Issues:

2.8.1 Users/Services Impacts

If a wireline customer changes service from a LEC that supports ELCAs to one that does not, confusion could result because call charge treatment to the wireline caller would change for calls to some wireless end-users. The same confusion might occur if a wireline SP ceases its ELCA participation.

Currently, end-users can identify which calls qualify for ELCA rate treatment by the NXX of the called number. This NXX-to-service association will cease when and where wireless LNP is implemented.

End-user education may be desirable to minimize adverse impacts from the scenarios listed above.

2.8.2 Dialing Changes

None identified.

2.9 Public Safety Issues:

No E9111 or other public safety-related issues have been identified with the deployment of wireless ELCAs. Wireline ELCAs may cause difficulties if an NXX spans more than one E911 serving area.

2.10 Other Considerations:

2.10.1 Regulatory/Jurisdictional Considerations

None identified.

2.10.2 Conditions under which Benefit may be maximized

- *ELCAs that include a large number of rate areas.* Number optimization may be maximized in areas with low demand spread throughout a large number of rate areas. This will allow those customers to share a small number of NXXs.
- *Most or all wireline SPs offering ELCA within the same area*. The service is most effective in areas where all SPs within the same geographic area provide ELCA capability. This minimizes customer confusion. (e.g., Some wireline customers incur toll charges on calls to CMRS subscribers, while others do not.)

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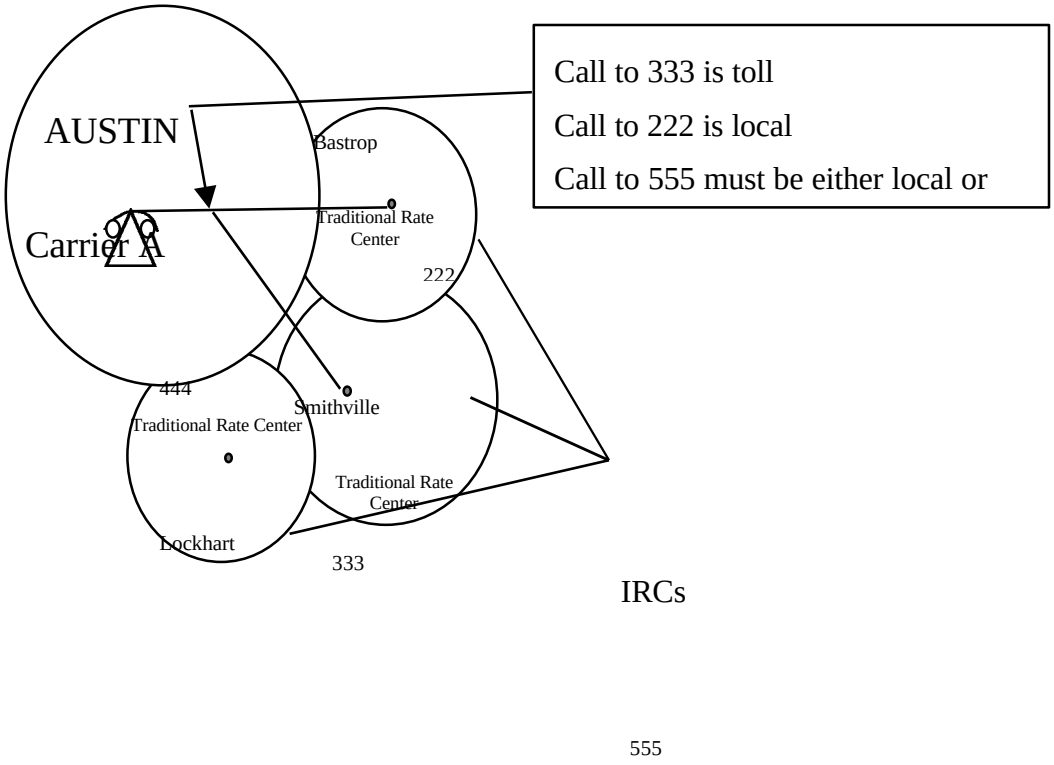
3 Inconsistent Rate Centers

3.1 Description:

An Inconsistent Rate Center ("IRC") exists when, for the serving area of a competing telephone company, the rate center boundaries do not match the rate center boundaries of the ILEC ("Incumbent Local Exchange Carrier").

CLECs do not always duplicate ILEC network configuration. Although CMRS providers also do not duplicate ILEC networks, for purposes of this document, this description only refers to the CLEC and ILEC relationship. ILEC networks have evolved largely because of an increase in numbers of subscribers over time in a given area. CLECs enter the market place and must be available to serve all potential customers to compete and have no consistent way to know where individual customers may be derived. Until a new CLEC can determine the geographic makeup of its customer base, an entrance strategy may be to serve a large geographic area with a single switch. The geographic boundary of a CLEC switch is likely to initially be larger than the geographic serving area of an ILEC switch. To address this disparity of serving area size, the CLEC switch can either serve multiple ILEC rate areas or create one or more IRCs to match the CLEC switch serving area. Thus, IRCs allow a SP to utilize reduced number of NXX codes for the entire geographic service area.

IRCs are used to define a unique geographic area different from existing rate area boundaries. Where IRCs currently exist they have been either arbitrated or negotiated as part of the interconnection agreement process and have been approved by the state regulatory authority. All SPs must determine the appropriate jurisdictional nature of a call to a customer of an SP using an IRC, based on the NXX of the called party. The difference occurs because a call from outside the IRC to a customer of an SP using an IRC may be rated differently.



For example, in the diagram above, a call from Carrier A's customer in Austin to the incumbent service provider's rate centers 222 customer is a local call but to the traditional service providers rate center's 333 customer it is a toll call. Because the IRC is larger than the established rate centers which it encompasses, Carrier A would need to establish by agreement or arbitration, the Rate Area identity for the IRC. This in turn would determine which calls from the traditional rate areas would be treated as local, and which would be treated as toll call. A call from either traditional service providers rate centers customer 222, 333 or 444, to IRCs service providers customer 555 would be a local call.

3.2 Additional Assumptions:

- IRCs will be approved by the state regulatory authority.
- All wireline calls between the existing rate centers within the geographic service area covered by the IRCs are local calls by negotiated agreement between the affected parties.
- Calls from outside the IRCs are local or toll based on NXX and calling scope relationships.
- SPs should be able to control their retail plan and outgoing local call scopes.
- Porting of numbers between IRC and traditional Rate Centers is technically feasible under the LRN LNP solution. However rating and routing issues may need to be addressed.

- The SPs would reach agreement by negotiation or arbitration, the appropriate compensation for each type of call.

3.3 Implementation Timeline

The following steps must be undertaken to implement IRCs:

- Agreements among SPs.
- Development and filing of tariffs
- Approval by State regulatory bodies.
- Switch routing changes driven by the LERG.
- Some modifications will need to be made to SP rating and billing systems. The timeline associated with these OSS changes should be determined as part of the negotiations and regulatory processes.

Once affected SPs have reached agreement related to the IRC and the agreement has been approved by the regulatory bodies to define compensations between the companies, the IRC may be implemented by the effective date of the LERG changes. Alternately, the SPs may agree on a different time table.

The respondents to the SP cost questionnaire indicated that it would take 6 to 24 months to implement IRCs. It was not clear from the questionnaire responses what milestones might be included in the timeframe.

3.4 Cost Estimation

Similar to the implementation timeline described above, the costs for IRC are subject to a number of variables unique to each geographic area and SP. The ATF issued a cost questionnaire to further capture and analyze implementation cost information from End Users, Service Providers and Industry Suppliers. Aggregated results have been analyzed and can be found in Attachment 12. It has been difficult to identify an overall cost that is applicable in all areas.

3.4.1 Service Provider

- Service Providers may need to modify rating tables and OSSs.
- Under LNP SPs other than the SP originating the IRC arrangement might need to make changes to their tariffs.

3.4.2 End User of Telecommunication services

- There is a potential for increase in toll charges for some IXC and private line service from other rate areas

3.4.3 Other users of telecommunication numbering resources

None Identified.

3.5 Benefits of Measure

3.5.1 Qualitative

- IRCs add to the variety of SP calling plans.
- IRCs allow new SPs to enter market with no necessity to know exact locations of customers.
- The measure creates the opportunity for the customer to have a larger geographic area with a local identity.
- The measure allows end users of SPs offering IRCs to relocate over a wider area while maintaining the same TN.

3.5.2 Quantitative

- IRCs conserve NXX codes since SPs using IRCs do not require a separate NXX per ILEC rate area in order to serve all customers.

3.6 Technical Considerations

3.6.1 Switch/OSS Development and Administration

- Routing, Rating, and Screening tables may need to be updated and/or modified to capture new rate centers.
- Trunking rearrangement may need to occur.
- Modifications to SP OSSs may be required to accommodate new compensation arrangements.
- Modifications are needed to OSS and Switching Tables if end users are allowed to port from SPs using IRCs to an SP using traditional rate centers and vice versa.[6]

3.6.2 Network Reliability

No other technical considerations related to IRCs have been identified.

[6] The issues related OSS and Switching tables modifications for IRC are similar those that will need to be resolved for porting of number with porting of number with optional 2 way EAS arrangements. (Texas)

3.7 Impact on Competition

3.7.1 Equal Availability of Numbers

Although IRC reduces future demand for NXXs, it may not supply any additional NXXs, nor does it allow for sharing of previously assigned NXX codes between service providers. It will allow for more efficient utilization of numbers from existing and future assigned NXXs; however, the degree of efficiency realized is dependent upon geographic coverage of the IRC compared to the existing Rate Areas and the number of SPs within each IRC.

3.7.2 Implementation Impacts

3.7.2.1 Out of Area

- Other SPs may need to change billing system data to reflect new rate centers.
- Other SPs' individual toll rates between points may change.
- Customer education may be required.

3.7.2.2 If Not Uniformly Implemented By All Service Providers

IRCs may increase the number of wireless/wireline points of interconnection and possibly the number of NXXs required by wireless SPs, if the previous wireless rate centers are not included in the IRC calling area.

3.7.2.3 Disproportionate

- It may be easier for CLECs to implement IRC than ILECs.
- IRC's may prevent or make it extremely difficult for SPs to allow customers, previously served by an SP using IRC, to retain their TNs while changing SPs. (i.e., SP LNP)
- End users of SPs using IRCs may be able to retain TNs on moves within a large geographical area included in the IRC.
- IRC's may create the need for additional pools in a number pooling environment, and the possible need for additional number resources to populate the pools.
- The inconsistency inherent may generate additional SP customer inquiries regarding rates.

3.8 Consumer Issues

3.8.1 Users/Services Impacts

- The Basic concept of local calling based upon a select set of NPA-NXXs is maintained. The size of the local area and/or toll boundaries may change.
- Rate center names and charges on customer bills may change.

- Customer education may be required.
- Calls to different customers in the same geographic area but served by different SPs may result in different charges.

3.8.2 Dialing Changes

None identified.

3.9 Public Safety Issues

Impacts on E911 must be studied and understood before IRC can be implemented. Constructive interaction between serving carriers and Public Safety Answering Point (PSAP) administrators must be undertaken in order to realize the maximum advantages of rate center consolidation. For example:

- Consideration must be given to the routing of 911 calls before approval of any IRC plan. Since default routing of 911 calls is NXX driven, not all 911 calls from each inconsistent rate center may be routed through the same ILEC tandems or switches to the PSAPs. Involvement of the 911 community is essential when determining the impact IRC will have on the routing of 911 calls and how roadblocks can be eliminated cost-effectively and without any disruption of service.
- Because PSAP regions fall within the jurisdiction of state/local regulatory authorities, the geographic based issues will vary.
- PSAP provider participation in IRC activities, although voluntary, is essential. PSAP administrators should be involved in the IRC process from the beginning.
- Modifications for E911 default routing may be required. Modifications to tandems may be required as well.
- Differing rate center boundaries may make default routing to 911 tandems more complex.
- The benefits of RCC may be reduced if E911 routing service requirements continue to require SP's to have at least one NXX per PSAP service area.

3.10 Other Considerations

The maximum benefit of IRCs in a pooling environment can be realized by requiring all providers using IRCs to be identical to each other. Deployment of IRCs across NPA boundaries will not supply maximum benefit of this method.

3.10.1 Regulatory and/or Jurisdictional Considerations

- Rate centers are within the State's jurisdiction

- IRCs may require regulatory approval, particular if they necessitate changes to other SPs' tariffs.
- IRCs may complicate the NPA relief process.

3.10.2 Conditions under which Benefits could be Maximized

- Minimum number of IRC arrangements with maximum SP participation within a given area.
- IRC boundaries encompass entire existing rate center(s).
- IRCs, when approved by the state regulatory commission, can conserve use of NXXs; permit new entrants to network efficiently; permit new entrants to have the same opportunity as the ILEC to establish their own rate centers (within parameters set by the PUC); and permit new entrants to offer customers new calling scopes.

PART B. NUMBER OPTIMIZATION MEASURES THAT ARE LRN-BASED

4 Individual Telephone Number Pooling Section

4.1 Description

This section describes a proposed architecture to implement Individual Telephone Number (ITN) pooling with various alternative approaches identified in specific elements. It should be noted that no qualitative or quantitative analysis of either the costs or the benefits of ITN pooling was performed to support the conclusions in this report. The conclusions are based upon information available at the time that the report was prepared and the informed judgement of subject matter experts involved in the preparation of this report.

ITN pools are formed for the smallest geographic area used to distinguish rate boundaries and are referred to as a “rate area” throughout this report. ITN pooling relies, as a prerequisite, on the same network technology used to implement permanent Service Provider (SP) Number Portability. In this document, that technology is referred to as Location Routing Number/Local Number Portability (LRN/LNP). Please see a description of number portability architecture immediately following this section. Explanations of the LNP terms "LRN" and "NPAC SMS" are provided later in this document.

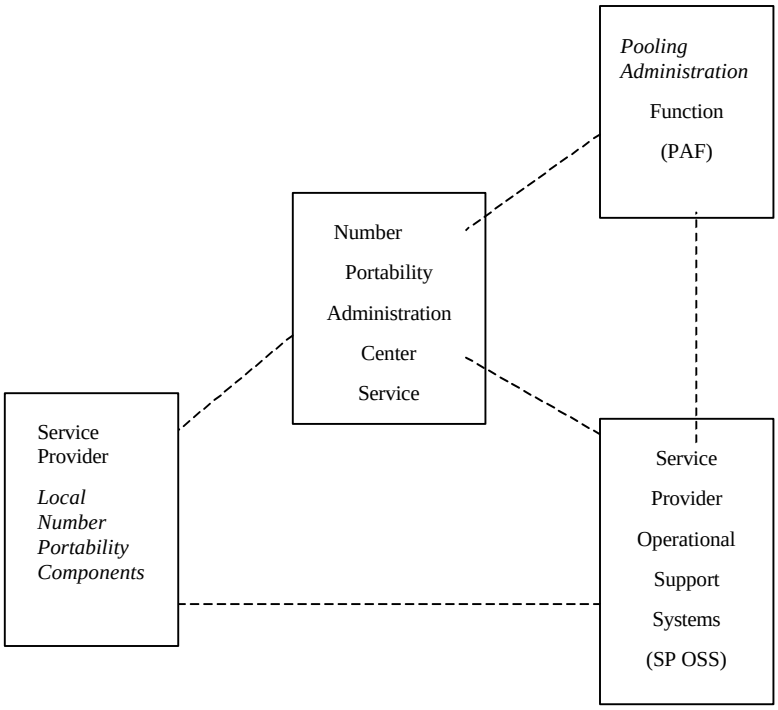


Figure 1 – ITN Pooling Functional Architecture

Referring to Figure 1, 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) 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 and provide LNP routing data to the SP switching systems. This facilitates 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 Pooling 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. See a further description of the PAF in Section 1.2.

Though the above components comprise the high level ITN pooling functional architecture, there are several implementation alternatives that have been evaluated by the ITN Task Force. These alternatives are described in the following sections. For a detailed description of the alternatives described in this document, refer to Attachment 4-1 (MCI ITN Pooling proposal, found immediately following this section), Attachment 4-2 (AT&T ITN Pooling proposal, found immediately following this section), and Attachment 2.4.1 (Lockheed Martin ITN Pooling proposal). The text contained in these appendices is as offered by the contributors and, although not edited by the Task Force, was utilized in the development of the recommendation contained herein.

4.1.1 Treatment of Available TNs

For ITN pooling, with the exception of TNs that are in the SP's inventory, all available TNs are in the PAS for allocation to the SPs. There are two options for the way that available[7] TNs in the PAS may be treated. One option requires that an available pooled TN will appear as a ported TN in the LNP Systems, while in the other, an available pooled TN will not. For ITN pooling, the PAF manages the allocation of available TNs. Of the two alternatives described below, the ITN Pooling Task Force recommends the option in which available TNs do not appear as ported TNs in the LNP systems (not be in SP LNP components), as described in Section 4.3.

4.1.1.1 Option 1: Pooled Available TNs Contained Within SP LNP Components

In this alternative all available pooled TNs are treated as ported TNs and appear in the SP LNP component. SPs obtain TNs from the Pool by interacting with a third-party PAF and, when later placing these TNs in service, by interacting with the third-party NPAC SMS.

When a TN is available in the PAS, the LRN of that pooled TN is a non-routable NPA-NXX that identifies the TN as being in the PAS. If the TN is under the control of a SP, the LRN of the TN points to the switch serving the TN. Thus calls to pooled TNs, i.e., non-working TNs, receive an invalid NPA-NXX intercept announcement at the switch doing the LNP database transaction. Optionally, the LRN of the available, pooled TN could be a routable NPA-NXX assigned to a third-party "network element." The switch

[7] The Industry Numbering Committee (INC) has agreed that those numbers that do not fall under any of the categories defined as unavailable would be defined as available. The INC has also agreed to include the following in the unavailable status: working (includes the sub-category "soft" dial tone), aging, reserved, test, dealer numbering pools and TLDNs (Temporary Local Directory Numbers).

performing the LRN query could use this network element to provide the vacant code announcement in the event that it is unable to do so itself, such as when its announcement trunks are busy. The third-party network element could be any network component capable of receiving calls through trunks and capable of playing announcements, e.g., a service node, a switch, or a partitioned switch.

The movement of TNs between SPs and the PAS is accomplished by conventional number porting methods, with the PAF looking much like a SP in the process. All ported TNs, both administratively and from a network perspective "snap-back" to the PAS after aging. Disconnected TNs not previously pooled or ported are moved to the PAS by performing a conventional port, with the donor SP acting as the "old SP" and the PAF acting as the "new SP."

4.1.1.2 Option 2: Pooled Available TNs not Contained within SP LNP Components

As with Option 1 above, all available TNs not in the SP inventory within pooled NXX codes are included in the third-party PAS. Available TNs in the PAS are not in the SP's LNP Components. Blank number treatment is handled as it is today. The call would signal to the Local Exchange Routing Guide (LERG) assigned switch which could return an SS7 “Release with Cause” to the originating switch to indicate blank number treatment. Alternatively, blank number treatment could be provided by the LERG assigned switch itself. The PA may be called upon to request SPs to be the LERG assignee.

When pooled TNs are allocated to a SP from the PAF, the TNs may be ported at the time of allocation by the PAF or when subsequently assigned to the customer. If the number is LERG assigned to the switch that the customer will be served from, the SP need not port the TN, although the TN must be indicated in the PAS as an assigned TN. When disconnected, all ported TNs will “snap-back”, from a network perspective, to the LERG assignee for blank number treatment, and will “snap-back” to the PAS for TN allocation.

4.1.2 Pool Administration Function

As mentioned above, the PAF is comprised of both the PA and the PAS functions that are required to support ITN pooling. The PAF will provide mechanisms to allow a SP to request numbering resources to support their customer demands and to replenish their inventory as necessary. There are several high level functions that the PAF must support:

- Number Administration
- Database and Interface Management
- Reporting, Auditing, and Accounting
- Forecasting and Replenishment

Referring to Figure 1, there are requirements for the PAS to have interfaces with the NPAC SMS and the SP OSSs. Additional details can be found in section 4.13.

The interface between the PAS and the SP OSSs provides functions for the SP to replenish its inventory of TNs and to request additional TNs beyond its existing inventory for specific customer applications.

The implementation of ITN pooling requires interaction between the PAS and the NPAC SMS to ensure that TNs that are either selected for use through the PAS or disconnected, have passed the aging period, and are properly updated in the PAS, NPAC SMS and the SP LNP components. The existing message set that has been defined between the SOA/LSMS and the NPAC SMS may be used as a baseline for the development of the additional functionality that will be required to support ITN pooling. Potential flows between the PAF and the NPAC SMS are shown in the section on ITN Architecture following this section.

Some have suggested that the PAS would be a separate system from the current NPAC SMS. This system would have a completely different set of hardware and software to implement the functional requirements and may also be deployed independently of the regional NPAC SMSs that are in operation today. A third-party administrator will be responsible for operating and managing the PAS and performing the administration duties of the PA.

Others suggest that the PAS may be an enhanced use of the existing NPAC SMS. This could be thought of as adding the PAS functionality to the existing NPAC SMS functionality. With this option, a third-party may still be responsible for performing the administrative duties of the PAF but the current NPAC SMS administrator could perform the system operation.

Participants of the ITN Pooling Task Force believe that the foregoing is an RFP bidding issue and make no recommendation as to the preferred implementation option.

The geographic scope and performance requirements, e.g., record storage, number of transactions, etc., of the PAS have yet to be determined. ITN pooling, if deployed throughout an entire region, would need to support pooling within dozens of NPAs and would involve requirements significantly different from and potentially more complex than the requirements of the SMS/800, the only existing example of a single telephone number allocation and administration system.

4.2 Principles and Assumptions

4.2.1 ITN Pooling Participation Principle

SPs who have implemented permanent LNP 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 also participate in number pooling where number pooling is implemented. SPs that participate in ITN pooling shall not request and receive NPA-NXX assignments outside the pooling process.

4.2.2 ITN Pooling Reciprocity Principle

SPs participating in ITN pooling shall be obligated to both contribute to and draw TNs from the PAS using only the ITN pooling process, in accordance with guidelines.

4.2.3 ITN Pooling Non-participation Principle

An SP switch need not be modified to support ITN pooling until the SP is required to modify it to support LNP in a rate area[8]. ITN pooling should not preclude such SPs from obtaining usable non-pooled geographic numbering resources as they do currently.

4.2.4 ITN Pooling Architectural Flexibility Principle

The architecture selected for the implementation of ITN pooling should allow SPs reasonable flexibility in the manner in which they interface with the PAS supporting ITN pooling.

4.2.5 ITN Pooling Customer Transparency Principle

The mechanism by which ITN pooling is provided shall be transparent to the customer.

4.2.6 ITN Pooling Network Reliability Principle

When selecting an ITN pooling architecture and implementation methodology, serious consideration must be given to network reliability and performance so that no adverse impacts are realized.

4.2.7 ITN Pooling LNP Impact Principle

The implementation of any ITN number pooling mechanism or methodology should not affect the functionality of, or schedule for, LNP as ordered by the FCC.

4.2.8 ITN Pooling Uniformity Principle

The architecture, provisioning methodologies, administrative procedures and interfaces used to support ITN pooling shall be uniform nationwide.

4.2.9 ITN Pooling Assumptions

- ITN pooling can only be implemented in locations where and when LNP has or will be implemented, and by SPs which have or will implement LRN LNP.
- ITN pooling will not be implemented until a neutral PA is in place and able to perform the number administration function.

[8] Due to code opening constraints, certain switch types that are LNP capable may be unable to support pooling (see Section 6).

- ITN pooling will not be industry segment specific. Although there may be additional considerations unique to particular segments of the industry, number pooling must be available to all LNP-capable SPs.
- Initially, each ITN pooling area will be constrained to a rate area. This does not presume that the use of ITN pooling will ultimately be limited to the existing rate area boundaries.
- The current wireline call rating paradigm, in which call rating for wireline SPs is based upon the rate areas associated with the calling and called party, will not be impaired by ITN pooling.
- Implementation of ITN pooling will be subject to applicable local, state and federal regulatory requirements.

4.3 Implementation Timeline

The following section outlines the various high level tasks necessary to make ITN pooling a reality. Although some of the tasks can be performed prior to the time a regulatory body with appropriate jurisdiction issues its decision to require implementation of ITN pooling, the critical timeframe begins with that decision. Some tasks on the following timeline require formal regulatory guidance, including resolution of cost recovery issues.

In each task listed below, there is a broad range estimate, generated by the ITN Pooling Task Force, of the months required to complete each task. These estimates are based on experience of the participants and do not represent commitments by the identified responsible group(s). For most activities, a recommendation regarding the appropriate industry group or organization that could be delegated responsibility to achieve the listed task is indicated.

The estimated time line does not address the regulatory environment, e.g., the process and time period required for an FCC order to deploy ITN pooling and the local public utility commission activity for any required approvals and mandates. The time line assumes that there is an industry agreement in place for an appropriate industry group to perform the project management for ITN pooling implementation.

What follows are the high level tasks that are required to implement ITN pooling**. The asterisk (*) denotes tasks which may be undertaken and accomplished prior to receiving a regulatory mandate, which includes resolution of cost recovery issues. The " " denotes tasks which are considered the critical path tasks.** Critical path tasks are those which a) require completion in sequential order; and b) contain the longest intervals within their order of sequence. All other tasks are believed capable of completion within the intervals identified for the critical path tasks.

Proposed Project Management/Technical Tasks and Estimated Timeline[9]

(Note: List is not all-inclusive.)

	TASK	TIME PERIOD	RESPONSIBLE GROUP
1.	Recommendation of an ITN pooling architecture *	1-3 months	NANC
2.	Develop high-level requirements *	3-6 months	NRO-WG/OBF
3.	Pooling Number Administration guidelines *	9-12 months	INC
4.	PAS and system interface requirements *	6-9 months	NRO-WG
5.	NPAC SMS system requirements *	6-9 months	NANC LNPA
6.	Public safety requirements	6-9 months	Public safety agencies
7.	Determine who will issue the RFP(s) *	1 month	NANC
8.	Prepare and develop RFP for pooling administrator *	3-4 months	TBD

[9] Additional tasks may be identified for wireline and wireless networks that might elongate the timeline.

REGULATORY ORDER REQUIRED TO PROCEED			
9.	Ensure regulatory compliance of RFP	1-3 months	TBD
10.	Issue pooling administrator RFP	1 month	TBD
11.	Preparation of vendor proposals	2 months	Vendors
12.	Evaluate and select vendor * (including negotiations)	3 months	NANC/NRO-WG
13.	Determine billing and collection agent	Concurrent	Cost Recovery
THIS IS CONCURRENT WITH ABOVE RFP PROCESS			
14.	Prepare and develop RFP for Pooling Administration System *	3-4 months	TBD
15.	Ensure regulatory compliance of RFP	1-3 months	TBD
16.	Issue Pooling Administration RFP	1 month	TBD
17.	Vendor proposals preparation	2 months	Vendors
18.	Evaluate and select vendor responses	2 months	NRO-WG
19.	Develop network or signaling requirements	3-6 months	T1S1.6
20.	PAS (FRS/IIS[10])	6-9 months	NRO-WG/OBF
21.	Develop FRS and IIS for NPAC SMS	6-9 months	NANC LNPA
22.	Build/modify/deploy systems	15-27 months	Vendor/SP's, PAS, SP OSSs, NPAC SMS, Test interoperability of: NPAC SMS - PAS, SP OSSs - PAS Service Provider administrative systems - NPAC SMS
23.	Network enhancement/deployment and testing	9-15 months	
24.	Develop Implementation Plan	3 months	
25.	Industry training	2 months	
26.	Test the entire process and system	6 months	

[10] FRS = Functional Requirements Specification

IIS = Interoperability Interface Specification

27. Establish the pool(s)	1-3 months

**** Tasks which may be undertaken and accomplished prior to receiving a regulatory mandate which includes resolution of cost recovery issues.***

✠ CRITICAL PATH ITEM: Items which must be completed before thenext step in the project can proceed. The Critial Path (✠) totals are approximately four to six years.

The time estimate above assumes that some of the tasks can be performed in parallel. With industry commitment to the proposal, four to six years may be required to implement ITN pooling, dependent upon receiving a regulatory order in the first one to two years. If the regulatory body with appropriate jurisdiction does not issue its decision to require ITN pooling within the first one to years, additional time (beyond the four to six years) may be needed to complete the implementation of ITN pooling.

4.4 Cost Estimation

NRO-WG agrees with ITN-TF members that given the low response rate for the ITN questionnaires, little if any conclusion can be drawn from the data. As such it is offered for information purposes only in Attachments 3-7 through 3-13.

4.4.1 Service Provider

The ITN Task Force has developed the following elements that may contribute to the overall cost to provide ITN pooling. Not all SPs may incur all of the SP related costs below. In addition, some of the costs that are identified below may not be fully attributable to ITN pooling:

- NPAC SMS transaction charges - The NPAC SMS transaction charge is currently applied to each TN that is ported.
- NPAC SMS modifications - Modifications of the NPAC SMS to support Efficient Data Representation (EDR), PAS interface and other functional changes will be necessary.
- Development and deployment of the PAS - This will be for the definition, development, deployment, and testing of the PAS.
- PAF operation - Operation for the PAF will consist of the ongoing system maintenance and operation of the PAS, as well as the PA functions that will be required of a third-party.
- SP LNP Systems – It is potentially necessary to add additional capacity to handle the increase in the number of records that is required for ITN pooling.

- SP OSSs - Modification of the OSSs to interface with the PAS and to remove system dependency associating a CO code to a switch will be required. Minor SOA system changes may also be needed to accommodate ITN pooling changes to the NPAC SMS interface.
- Public Safety System modifications - There may be some modifications to the public safety systems, e.g., to remove the association of CO code to switch.

4.4.2 End User

ITN pooling should introduce no direct costs to the end user. It should be acknowledged, however, that costs incurred by SPs may be eventually recovered through end users. Cost recovery will need to be addressed by appropriate regulatory entities.

4.5 Benefits of Measure

Following are the qualitative and quantitative benefits from ITN.

4.5.1 Qualitative Benefits

- The potential benefit of ITN pooling is an increased efficiency of NANP resource utilization. This could lead to less frequent NPA exhaust situations. To the extent ITN pooling can help conserve NPAs, it may allow for a delay in NANP expansion due to frequent NPA exhaust. However, NANP expansion may be triggered by factors other than the exhaust of the supply of NPAs.
- Any or all SPs participating in ITN pooling may have access to a broader base of numbering resources that are desirable to customers.
- ITN pooling has the potential to increase the efficient utilization of NXXs. However, the degree of increase will depend on specific factors in the pooling area, e.g., level of SP participation and characteristics of the pooling area.
- To the extent that embedded numbering resources are donated to a rate area pool, ITN pooling will increase SP access to those embedded resources.
- End users/consumers derive additional benefits from LNP technology as a result of its use for pooling.
- Pooling will potentially increase end user's ability to receive service from a SP with the number resource of the end user's choice.

4.5.2 Quantitative Benefits

- Increased efficiency of NXX utilization can be measured by the Pooling Administrator several months to a year after ITN pooling is implemented. This can be done by comparing pre- and post-ITN pooling SP utilization reports.
- Delay of future NPA relief efforts can be measured by comparing the pre-ITN pooling NANPA projected NPA exhaust date to the actual NPA exhaust date.

- Increased SP access to currently embedded numbering resources can be measured after the Pooling Administrator determines the final quantity and source of currently embedded TNs that participating SPs donate to each rate area pool.

4.6 Technical Considerations

4.6.1 Inventories

The ITN Task Force has determined that there is a requirement for SP inventories. An implementation method that includes accommodating requests for unique TNs to meet specific customer needs is described in section 4.13.

4.6.2 Service Provider Inventories

There are multiple technical reasons that SPs require access to an adequate service provider TN inventory.

4.6.3 Service Negotiation

SPs must have TNs available for assignment to customers in order to provide new service. Additionally, Commercial Mobile Radio Service (CMRS) customers expect instant activation of their service. Some SP sales channels do not have access to the SP's internal TN administration system. Due to the lack of instantaneous access to the TNs available for assignment, these sales channels are often provided paper copies of TNs that they can utilize for providing new customers service. Because of the uncertainty of customer demand, these sales channels are provided with an ample supply to assure they have sufficient TNs so as not to deplete their entire supply. It should also be noted that quite often these sales channels operate outside the SP's normal business hours, so they would not be able to gain access to additional TNs if they were to deplete their inventory "after hours."

4.6.4 Service Activation

SPs require their own inventories in order to allow them to be able to provide service to meet their customer demands, including having sequential number ranges available for multi-line customers. Wireline SPs perform pre-provisioning in order to meet same-day service demands wherever possible. Wireless SPs require SP inventories in order to meet "instant" service activation demand for almost every new customer.

Current and planned network elements and systems for both wireline and wireless SPs are not designed to operate without the presence of a SP inventory. Modifications necessary to accommodate having no SP inventory may complicate and could affect implementation of ITN pooling. The size of SP inventories is a pooling guideline issue that will require further industry discussion.

4.6.5 Additional Considerations

Interfaces used to accomplish service activation interact solely with internal CMRS provider systems. These interfaces are sometimes electronic, but often consist of a service representative phoning a representative of the CMRS provider. Interaction with external systems would require significant development and modification to existing CMRS networks and systems. In addition, it would be necessary for each of the tens of thousands of CMRS points-of-sale locations to have an interface with either the CMRS provider or the PAS inventory. Today, use of these interfaces is relatively infrequent for most points-of-sale. Thus, the number of interfaces, as well as the number of interactions, will exponentially increase without SP inventories. This will add cost to the process and will significantly increase transaction volume between points-of-sale and SP and/or the PAF.

To prevent fraud and to maximize system capacity, the TN assigned to the terminal unit must be activated in the billing and provisioning systems, the switch, the Home Location Register (HLR), and TN inventory systems prior to their use. In general, these activities must be completed days or even weeks prior to assignment of TNs to customers. Therefore a SP inventory is necessary.

An additional concern is the need to activate NXXs in SP networks. Unless the TN assigned to the customer is from an NXX already active in the SP's network, there will be a delay as the NXX from which the TN is assigned is activated for use.

4.6.6 Pooling Administration Inventories

The size of PAS inventories is a pooling guideline issue that will require further industry discussion.

4.6.7 Pooling Administration System (PAS)

It is envisioned that ITN pooling administration functions will be needed to manage individual pooled TNs. The system proposed to provide these functions is referred to herein as the PAS. The capabilities needed include:

- Number Administration.
- Database and Interface Management.
- Reporting, Auditing, and Accounting.
- Forecasting and Replenishment.

Before describing these functions, it is useful to examine the functional process flow.

4.6.7.1 Process Flow Description

Figure 2 is a schematic of the proposed process flows for two types of TN requests to PAS. The two types of requests are for replenishment of the SP inventories and for

specific customer need. For ease in reading, the bold letters in the text below refer to action or decision criteria and mirror the analogous letters in Figure 2.

A - Number resource requests will be generated by Service Providers.

B - It is recommended that Service Providers access PAS to accomplish two types of ITN requests:

B1 - *SP Inventory Replenishment Request* - The SP Inventory Replenishment Request would allow a SP to specify whether they require consecutive TNs, non-consecutive TNs, or both in order to assure they were able to have sufficient TNs available to meet their forecasted demand.

B2 - *Specific Customer Request* - The Specific Customer Request would be for instances where the SP did not have the TNs which were being requested by their customer in their SP Inventory. This would allow the SP to request TNs to meet their customer's request. Additional details on how this might be implemented will be required in the guidelines.

It is further envisioned that requests for TNs outside the SP inventory would be those for which customers already existed. This means that a customer with a request for a block of TNs or for a specific TN and the request would need to be accompanied by the customer information. Furthermore, the customer may have a particular TN or set of TNs in mind, lending itself to a search capability within the PAS. This also lends itself to possible real-time access to PAS by SPs.

C - Criteria within the ITN Pooling Number Administration Guidelines will be used to determine whether reservation or immediate allocation requests can be met. If the request is not met, the requested TNs remain marked as available for all SPs.

D – When requesting TNs for replenishment of the SP inventory or to fulfill a specific customer request, the TN may be allocated immediately from the PAS to the SP. Requests for specific TNs for which there is no pending service order, however, may be held for a period of time at the PAS for future allocation (e.g., pending reservation).

E – Upon allocation, the TNs are marked in the PAS as unavailable to other SPs.

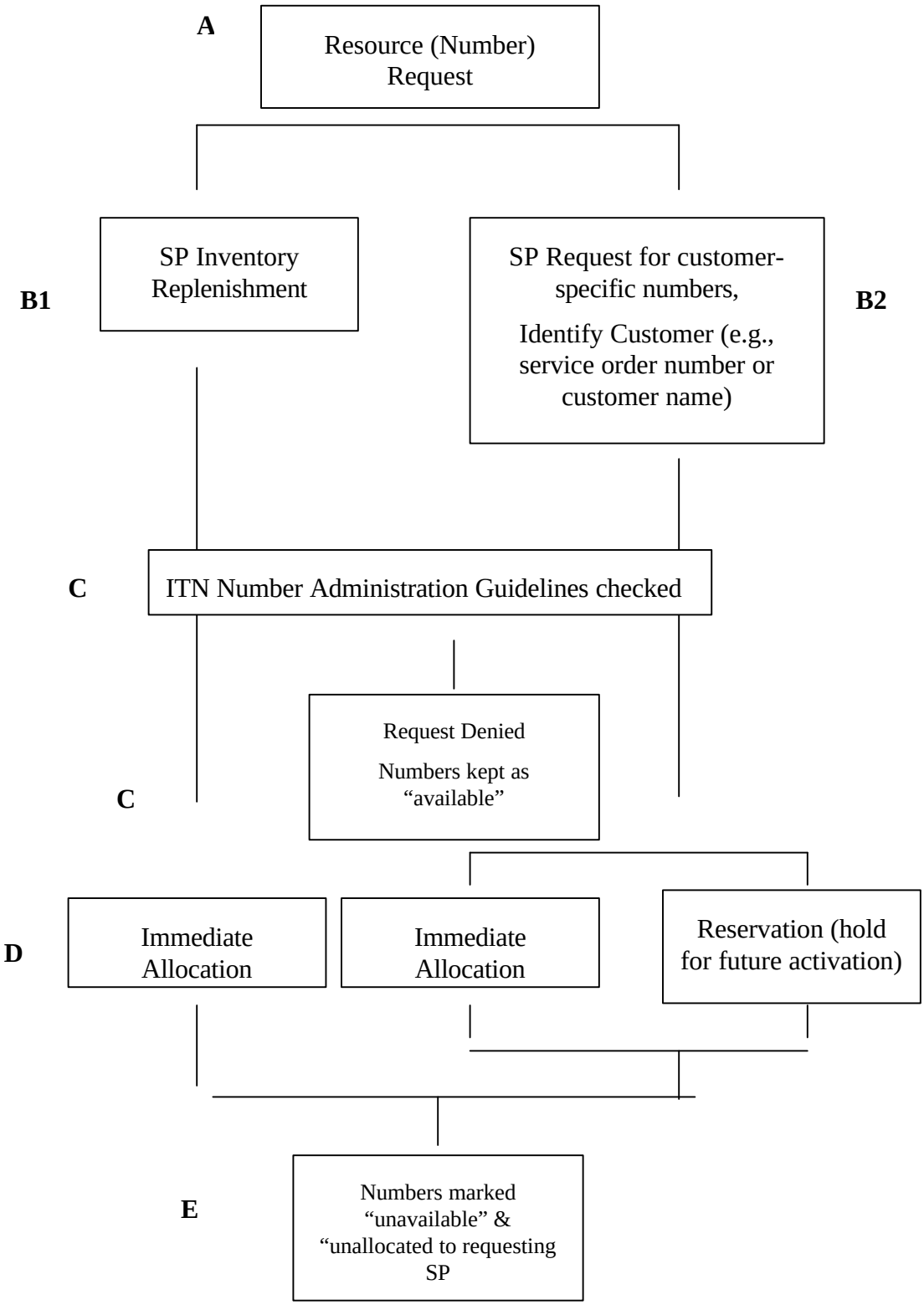


Figure 2 - Pooling Administration Functional Process Flow

4.6.7.2 Number Administration

Number administration can be defined as consisting of the number reservation, number assignment, and number status management functions. PAS will need to allocate TNs to SPs based on methods and criteria defined during the request process and in industry assignment guidelines. Examples of potential types of methods that could be introduced include, but are not limited to:

- Random TN requests (for one TN or a large amount of TNs).
- Specific TN requests.
- Requests based on partial specification of TNs (e.g., XX00).
- Requests based on specification of TN's (e.g., NXX-1234).
- Requests based on a specific NPA NXX (e.g., 732 699).
- Requests for ranges of contiguous TNs.

All requests may not be met, based upon industry assignment guidelines.

Number status management will be a critical function supported by PAS. Similar to the service management system for Toll-Free service, each TN might be assigned a status, dependent upon its state at any instant. PAS will need to manage causes of change in ITN number state, such as:

- Reservation of a TN.
- Cancellation of a reservation.
- Assignment of a TN to unavailable (e.g., from spare to test).
- Change in the status of a TN (e.g., from Available to Working).
- Change in reservation data on a TN that has been reserved.

Another alternative would be to require the PAS to track only statuses of "available" and "unavailable" TNs, which would then require each SP Inventory to track the specific statuses of the unavailable TNs (e.g., spare, working, reserved, aging) that have been allocated to them.

As demonstrated in Figure 2, some requests might be for single TNs, while others might be for contiguous ranges of TNs, based on, for example, residential vs. business subscriber needs. A business PBX customer might require a contiguous range of 200 TNs, whereas a residential customer would need only one TN. For example, some TNs in the PAS may only be available as part of a contiguous range of TNs. This is necessary to avoid opening additional CO Codes solely for the purpose of providing an adequate supply of contiguous ranges of TNs. The TN Management portion of Number Administration addresses when TNs should be made available for assignment and whether they should be held to maintain block integrity. Some TNs, though available in the PAS, may not be available except as a

part of a larger range of TNs. This is often considered to be the most difficult task in Number Administration.

4.6.7.3 Suggested ITN Number Administration Guideline Issues

Other issues that affect PAS functionality that will need to be addressed by number administration guidelines include, but are not limited to:

- Criteria for the reclamation of resources, e.g., how long a SP can keep a TN in its own inventory without being assigned.
- How long an SP can keep a TN reserved in the PAS inventory.
- The amount and criteria for allocating TNs for the purpose of replenishing SP inventories.
- The size of consecutive ranges of TNs for replenishment of SP inventories.
- The TN status categories to be maintained within PAS (e.g., available, unavailable, working, aging, etc.).
- The criteria for reservation at the PAS.
- The guidelines for adding TNs to the PAS (e.g., code openings, TN churn).
- Should disconnected TNs be returned to the PAS?
- Certification procedures for processing SP requests for both replenishing inventories and satisfying specific customer requests.
- How can warehousing of TNs be avoided?
- The definition of a "sufficient" SP inventory.
- How "mining" of preferred TNs can be avoided?
- The details for an auditing process (who, when, and why).

4.6.7.4 Database and Interface Management

The pool of TNs available within PAS will be dynamic and the process of managing the inventory will need to be incorporated into PAS system design. For example, the PAS could be initially populated with all spare portable TNs in a rate area other than the TNs retained in SP inventories. Active TNs in pooled NXXs may be placed into the PAS after being disconnected for reallocation. Reserved TNs in the SP inventory may be returned to the PAS after proper aging when the end-user with which they are associated disconnects service, or the TNs are no longer reserved. TNs from new pooled NXXs would likely go directly to the PAS.

The data attributes associated with each TN in the PAS would need to be defined. This data might include TN status, rate area, and date of entry into the PAS, along with specific information based on the status. For example, a previously used TN might be associated with a disconnect date, a former SP, and an end-intercept date if applicable. Furthermore,

industry guidelines will determine whether a service order number is a requirement for customer specific TN allocation.

PAS must support multiple rate areas, thereby requiring data partitioning. An SP request for data would need to be directed to the proper set of data for their respective rate area. TNs within a rate area are available only to the SPs authorized therein. Based on industry requirements, multiple PASs could interface with an NPAC SMS. Requirements for PAS deployment would need to be defined. PAS would probably be deployed on a sub-national level, for instance by state or region.

PAS will need to interface with several different types of systems, e.g., NPAC SMS, SP's TN administration systems. SPs without internal TN administration systems will directly access PAS or use an agent with access to the PAS. This suggests that sophisticated arbitration and security schemes are needed to protect data integrity.

4.6.7.5 Reporting, Auditing, and Accounting

Flexible reporting capabilities are required in the PAS. For example, customer ad-hoc reporting would be very useful. This type of reporting would allow SPs to request a wide range of information through the specification of reporting criteria within their purview, e.g., those TNs allocated/reserved to them. Such reporting capabilities could also be used by designated administrators in managing the TN resources.

Audits will become increasingly important with ITN pooling. Areas requiring audits may include, but are not limited to:

- Data synchronization between the PAS and the systems that interface with it to ensure data accuracy.
- TN utilization and size within individual SP inventories.
- Credibility of SP forecasts.

It has not been determined what level of auditing will occur, how it will be accomplished, or what types of interfaces might be required.

Accounting functions will also be important. Since PAS will be a shared resource, use of it by multiple SPs will need to be addressed. This may translate to a tracking of requests for data or data manipulation or storage.

4.6.7.6 Forecasting and Replenishment

Since a major purpose of number pooling is to improve TN utilization, the TN resources within PAS will need to be monitored. Tracking of TNs at various levels might include:

- Number of SPs by rate area.
- Number of spare TNs.
- By NPA-NXX, number of spare TNs, number of unavailable TNs.

- By SP, number of assigned TNs, number of reserved TNs, number of disconnected TNs.

These types of counts could be used to manage resources more efficiently and to better predict TN exhaust within a rate area. This capability could be labeled as forecasting since the tracking of TNs would help the PA to forecast TN availability in advance of a shortage situation. The PA will require SPs to report forecasts of numbering resources by rate area. The PA will then combine these forecasts with historical TN utilization data to develop PAS inventory requirements and request new number resources from NANPA as required.

4.6.8 Network Impacts

4.6.8.1 Switch Impacts

Pooling may have significant impacts in switching systems. Additional switching requirements may be necessary in order to allow switches to translate additional NPA-NXX combinations. Additionally, there may be switch development required to address vacant code announcement, service assurance announcements (cause code 26 replacement), pooling indicator, etc. This may be dependent on the final ITN architecture that is deployed. Although T1S1.6 is not currently working directly on ITN pooling issues, T1S1.6 is currently working the cause code 26 issue.

The industry is currently identifying requirements for thousand block number pooling. With these requirements still evolving, there is not enough information specific to ITN pooling to identify areas of commonality or difference with thousand block pooling. Therefore, providing an impact statement beyond those identified for thousand block number pooling is not currently feasible.

The areas of possible switch impacts identified include:

- Application of correct treatment, i.e., route to blank number treatment.
- Need for pooled indicator.
- Switch interfaces to the OSSs.

ITN pooling could have a significant impact on SP's ISDN packet routers. Such devices do not have LNP query capabilities, and as such, must build 10-digit routing translations on each TN used from the PAS for packet services. This will require significant manual effort, and may quickly exceed the routing table capacity of the packet routers. This may become a significant concern given the recent FCC Memorandum Opinion and Order and Notice of Proposed Rulemaking, Docket 98-188, concerning the deployment of advanced telecommunications services that may obligate SPs to provide access to their packet networks.

ITN pooling has a tendency to lead to a large number of varied and dispersed NXXs served by a given switch. This may lead to capacity implications on specific switches which will limit their ability to participate in pooling and obtain adequate numbering

resources. Inclusion or exemption of these switches in an ITN pooling environment needs to be addressed.

4.6.8.2 LNP System Impacts

There will be an impact of ITN pooling architecture on the LNP System loads. Both Options 1 and 2 affect the volume of porting transactions and number of LNP records that are created. Option 1, which defines every available TN in the PAS as a ported TN in both the network and PAS databases, has the greatest impact on requirements for ported TN storage and porting transaction volume capabilities. Similarly, Option 2, which requires that a pooled TN be treated as a ported TN only when an SP uses it, also has significant LNP system impacts. With this option, the proportion of working TNs treated as ported TNs increases compared to a non-ITN pooling environment. This is true even though a pooled TN could be treated as ported only when the recipient SP is not the NXX assignee.

The increase in ported TNs, characteristic of all the ITN pooling options, thus impacts the SPs' SOA and LSMS elements by substantially increasing the volume of ported TN transactions each must process. It also impacts each SP's LSMS that is used to update the network databases (SCPs), due to increased throughput requirements and increases in the amount of storage each LNP SCP must offer.

There may be several solutions to these concerns. One possible solution would be the introduction of Efficient Data Representation (EDR). However, if NXXs become distributed randomly across multiple switches, the benefits of the EDR currently under development for thousands-block pooling will decrease. Instead, a dynamic EDR capability may need to be developed to better support ITN pooling. The use of EDR, however, may also reduce the SCP query capacity.

Another possible solution may be to significantly increase the storage capacity of network databases. A third possible solution is to increase network database capacity by deploying additional pairs of network databases partitioned to cover smaller geographic areas. It may be appropriate to consider a combination of several of these solutions.

In addition to the capacity solutions identified above, there are functional modifications required of LNP Systems. The LNP System impacts to be discussed here are primarily related to the individual SP's Service Management Systems, the systems that directly feed them, and the LNP Network Database.

There are two scenarios that have functional impacts on LNP-related systems. These are provisioning of a new customer and return of TNs to the PAS after disconnect and completion of the aging interval. From the standpoint of provisioning, if a customer's TN is not in a CO code which is LERG-assigned to that SP, then the service provisioning systems must recognize that this is a TN that needs to be ported. It must initiate the porting process, recognizing the ITN pool as the old service provider. In the case where the assigned TN is to be served from the LERG-assigned switch, the provisioning systems may elect not to port the TN.

For the disconnect scenario, the service provisioning systems must send a disconnect message over the SOA to the NPAC SMS for both ported and non-ported TNs that are aged and are to be placed in the PAS. This is a change from the current mode of operation where disconnect messages are sent only for previously ported TNs.

4.6.8.3 NPAC SMS

Both ITN pooling options increase the quantity of ported TNs. An increase in ported TNs means that the NPAC SMS must process more LNP transactions and store more LNP records (pending, active, and old subscription versions). Thus, ITN pooling requires increased record storage capacity at the NPAC SMS and may require increased throughput capacities.

A change in NPAC SMS software will be required to allow it to "snap back" disconnected ported and non-ported TNs to the pool rather than to the NPA-NXX assignee, for some of the proposed ITN pooling architecture alternatives. Another possible NPAC SMS software change would be to allow it to recognize the PAS as an entity authorized to be "new SP" and "old SP" for an NPA-NXX, regardless of what other NPAC SMS user might be the NXX-assignee. As a third possible NPAC SMS software change is that a SOA/LSMS-like interface may need to be established to allow the PAS to communicate effectively with the NPAC SMS.

One of the PAS implementation alternatives discussed was the integration of the PA into the NPAC SMS. NPAC SMS changes required to accommodate this implementation alternative have not yet been identified and consequently, are not addressed in this report.

It also needs to be determined whether TNs received from the PAS will be populated in the LNP databases immediately, i.e., pre-port, or at some subsequent time, i.e., port-on-demand.

4.6.9 OSS Development and Administration

The impact of ITN pooling on SP's provisioning and support systems (e.g., OSS) is expected to vary by company. The largest impact may be to incumbent LEC systems, which were designed to interact with large, internal inventories of TNs, where the first six digits (i.e., NPA/NXX) of any TN could be used to identify a single switch and a single SP. A key component of such systems is a mapping of each street address to a NPA/NXX, which in turn, is used to identify the serving central office, available features and services, billing cycles, 911 system, etc. Although some modifications were made to accommodate the exporting and importing of TNs under LNP (and in some cases, thousands-block pooling), the linking of street addresses to an NPA/NXX has been preserved. With ITN pooling, such processing logic can no longer be supported, since SP inventories will be comprised of random TNs within many different NXXs , all allocated to the same rate area and switch. Changes required to accommodate ITN pooling may necessitate a complete replacement of certain ordering, provisioning and billing systems.

In addition, these systems may be required to interact directly with the PAS, both for routine replenishment of inventory and to address situations where customer needs cannot be met using TNs within the SP's own inventory. In such cases, a new interface will need to be designed to allow real-time interaction between the PAS and the SP's OSS. Additionally, depending on the level of auditing required, there may be a need for PAS interfaces with other SP's OSSs.

4.6.10 Network Reliability

It is acknowledged that number portability, due to its reliance on external database look-ups for call completion, increases the complexity of call routing. It also increases the difficulty in identifying the cause of call failures. Moreover, the SCP capacity concerns identified above, if not resolved, could lead to delays or a temporary halt in the SP's ability to port TNs to/from one another. Since ITN pooling increases the volume of ported TNs, these concerns are exacerbated and could adversely impact network reliability. For example, in the event of an SCP failure more calls will fail to complete because fewer calls will be able to rely upon default routing for completion.

4.7 Impact on Competition

4.7.1 Equal availability of TNs

ITN pooling has the potential to provide a positive impact on competition, because any or all SPs participating in ITN pooling may have access to a broader base of numbering resources that are desirable to customers. SPs are not precluded from obtaining TNs merely because their NXX is assigned to another SP.

ITN pooling may also have a negative impact on competition. There is a potential that allowing SPs to “mine” for TNs makes the TN a competitive tool. If this is true and if there are no effective controls put in place to prevent this activity, the result is that SPs would compete to get access to certain TNs, rather than compete for customers. This seems counter-productive to any number optimization efforts. Although not all participants agree that this result would occur, it does appear at a high level that this has become the case with the Toll Free Number Resource, which is the only example of ITN that has been implemented to date.

In addition, the methods by which SPs gain access to the PAS may, because of differing levels of sophistication (e.g., mechanized SOA/LSMS-like interfaces vs. low-tech Graphical User Interfaces), provide some SPs with certain competitive advantages in the type and volume of TNs they can obtain from the PAS, and the speed with which they can obtain them.

4.7.2 Implementation Impacts

Implementation impacts have been identified in other sections of this Report.

4.7.2.1 Out of Pooling Area

Non LNP-capable service providers, who deliver traffic directly to end offices that use pooled TNs, will encounter increased charges for undipped traffic. This is because the use of LNP to pool TNs means that more TNs will be "ported TNs" than if an LNP-based ITN pooling arrangement were not in effect. This impact is greatest for the ITN pooling alternative that treatsall pooled TNs as ported TNs in both the network and in the PAS .

4.7.2.2 By All Service Providers

CMRS SPs are not currently required to implement LNP until March 31, 2000 (FCC Order WT98-27). In addition, the CTIA has petitioned the FCC for forbearance from implementing wireless number portability. (A decision will either be made by December 16, 1998, or the petition will be deemed denied.) Also, these SPs are only required to implement LNP in the top 100 MSAs where bona fide LNP requests are made nine months prior to the FCC scheduled mandate date. At the same time, other wireless SPs, such as paging, Mobile Satellite, Narrowband PCS, most Specialized Mobile Radio Service providers, and some wireline SPs may be exempt from LNP requirements entirely. Nonetheless, these SPs require, and are entitled to, numbering resources on a fashion equivalent to ITN pooling SPs. Thus, careful consideration must be given to the number of SPs that will not be required to participate in LNP, and therefore ITN pooling, prior to recommending number pooling implementation. The relative value of ITN pooling as a numbering optimization measure is directly related to the number of participating SPs.

This may not be an issue if the date for CMRS implementation of LNP precedes the implementation of ITN pooling – see Section 4.3 - Proposed Project Management/Technical Tasks and Estimated Timeline for additional information.

4.7.2.3 Disproportionate

Since ITN pooling is reliant upon the implementation of LNP, and given that the LNP deployment schedule is not the same for all SPs, there is a likelihood that different SP segments (e.g., wireline, cellular, PCS, paging, etc.), and even some SPs within the same segment, will be treated differently in terms of number administration. LNP-capable SPs that are obligated to participate in pooling will receive smaller allocations of TNs with which to replenish their inventories and find it more difficult to obtain TNs in sequence or others that are more-preferred by end users (e.g., vanity numbers, TNs ending in 0 or 00). Non LNP-capable SPs , however, will still receive a full NXX per rate area. Those SPs that are bound by wireline rate areas may have deeper inventories of TNs to meet the needs of their customers. In addition, non LNP-capable SPs can avoid the expense of any modifications to OSS and other network components deemed necessary to participate in ITN pooling unless and until they become LNP-capable.

CMRS local calling areas are almost always much larger than the wireline equivalent. Unlike wireline SPs that most often require an NXX per rate area, CMRS providers can serve multiple rate areas with a single NXX. To the extent that CMRS providers have

high NXX fill rates, the implementation of ITN pooling for CMRS providers may not materially increase the overall efficiency of wireless TN utilization. Consequently, CMRS providers may view the ITN pooling-associated expense as having an unduly disproportionate cost to benefit ratio specific to their market segment.

4.8 Consumer Issues

4.8.1 Users/Services Impacts

The impact of ITN pooling on consumers/users[11] can be both positive and negative. Pooling can potentially benefit consumers by delaying the need for area code relief, which may have adverse effects on consumers, e.g., telephone number changes, 10-digit dialing, etc.

To the extent that number optimization measures, such as ITN pooling, increase the optimization of NANPA resources in a rate area (thereby decreasing the need to open additional NXXs), an end user with customer specific requirements will have fewer assignable TNs from which to choose. As the quantity of TNs being pooled and consequently being ported grows, the reliability and response time of the public network can be affected unless appropriate upgrades in capacity and technology are implemented. Without the appropriate upgrades, this situation will adversely impact end users and services being offered by SPs.

4.8.2 Dialing Changes

ITN pooling requires no change to the number of digits dialed by calling parties.

4.9 Public Safety Issues

ITN pooling relies on the same technology as LNP for the association of working TNs with SPs and their switches and thus does not introduce any additional known public safety issues. However, because ported TNs are routinely available for assignment in an LNP-based pooling arrangement, there will be an increase in situations where a TN will become associated with a customer located outside the NXX-assignee's wire center boundary, although within the same rate area. There is also a potential need to build a history file that associates past and present SP for each working TN that is accessible by all public safety agencies.

There are three methods of assigning numbers for non-dialable use in the wireless E-911 implementation and interconnection. Two of the three methods utilize NANP numbers. The first would utilize NANP numbers assigned to the wireless SPs; the second uses LEC NANP numbers. The third method utilizes fictitious, non-dialable numbers. All three methods permit public safety agencies to locate a wireless subscriber calling 911 by cell site location. There must be enough numbers allocated to this purpose to accommodate

[11] Applies to both residential and business customers.

the anticipated 911 traffic and to fulfill the technical characteristics of the given 911 architecture. It is important to note that wireless SPs are in the process of fulfilling a two-phased implementation of enhanced 911-location technology. Allocation of these numbers must be made to ensure compliance with this mandate. Thus, these numbers should be considered "nonassignable" for all purposes, including pooling. Also, the number pooling implementation method must be considered prior to permitting use of ported or pooled numbers for this purpose. Default routing, vacant number treatment and other considerations may preclude use of pooled or ported numbers for this purpose. Due to the scarcity of NANP resources, it may be preferential to utilize fictitious numbers for this purpose on a uniform, nationwide basis.

Confirmation of ITN pooling impacts should be sought from appropriate public safety agencies, e.g., NENA, APCO, etc., and should be addressed prior to proceeding with an ITN pooling implementation on wireline and wireless networks.

4.10 Other Considerations

4.10.1 Regulatory and/or jurisdictional considerations

The FCC has plenary jurisdiction over number administration. The FCC has delegated to the states the authority to resolve matters involving implementing new area codes (Paragraph 265, FCC 96-333, Second Report and Order and Memorandum Opinion and Order concerning various numbering issues).

Number pooling has attributes of both numbering administration and area code relief. Thus the level of authority states have regarding number pooling is subject to dispute among industry segments and regulatory bodies. Pooling has been defined as area code relief in several states and as such would give states the ability to mandate number pooling. On the other hand, others consider number pooling to be a numbering administration issue. However, in the FCC Docket 96-98, the Commission stated that pooling in and of itself is not number relief and should not be regulated by the states.

The FCC sets the schedule for LRN-LNP MSA implementation as it relates to service providers. Therefore, providers would not be bound by state initiated LNP based number optimization mandates, such as ITN where SPs have not implemented LNP. However, SPs should be expected to participate in number pooling when and where the FCC mandates implementation of LNP.

4.10.2 Conditions Under Which Benefits Can Be Maximized

As is the case with other number optimization alternatives, ITN pooling has the potential to achieve its maximum efficiency under certain conditions. Such conditions may include the following:

- *Optimal SP Inventory size* -

SP inventory size is a pooling assignment guideline issue. The pooling guidelines should address the SP inventory size that will ensure maximum optimization of the resource which may delay NXX exhaust if the pooling guidelines are followed and enforced.

- *Maximum LNP Deployment* -

  Given its reliance on the LNP architecture and process flows, ITN pooling works best in situations where all or most participating SPs and switches are LNP-capable.

- *SP TN Administration at the Rate Area Level* -

  Having the ability to assign TNs from a particular NPA-NXX to any switch in a given rate area, even in situations where one SP has multiple switches in that rate area, will allow spare TNs drawn from the PAS to be utilized in the most efficient manner. Current OSS limitations preclude the assignment of TNs from the same NXX to multiple switches in the same SP network.

- *Maximum SP Participation in Pooling* -

  The benefits of ITN pooling may be enhanced if all or most SPs in the area of pooling participate. To the extent that some SPs in the pooling area still require the assignment of full NXX codes, the overall optimization resulting from ITN pooling may be diminished.

- *Implementation Prior to NPA Jeopardy* -

  As indicated in the timeline shown in Section 3, ITN pooling will require a significant amount of time to implement. As such, ITN pooling may best be applied as a long-term optimization method, rather than a relief measure in situations where an NPA exhaust condition has already been identified.

- *Multiple SPs Serving the Same Rate Area* -

  ITN pooling will provide maximum benefit in situations where there are many competing LNP-capable SPs within each rate area. The pooling of available TNs within a NXX assumes that there are several SPs capable of using such TNs within the same rate area.

- *Uniform Reservation and Assignment Policy* -

  Whether or not reservations are permitted at the PAS and/or in the SP inventories, having uniform reservation practices will ensure consistency among SPs in the use of TNs. This will reduce the potential for disparate restrictions on the availability of TNs to all SPs and enhance the benefits of ITN pooling. If such uniform procedures are not developed and followed, some SPs may consume a share of the available resource disproportionate to their actual customer demand.

- *Limits on Selection of Preferred TNs -*

  If SPs are required to meet customer TN preferences from existing pooled numbers, with exceptions for technical constraints, there is the potential that fewer NXXs will be opened solely to meet those customer preferences.

- *SCP Capacity Solutions Readily Available -*

  One concern related to ITN pooling is the additional LNP database capacity needed to accommodate pooled TNs. Thus, one condition that will maximize the effectiveness of ITN pooling is to have sufficient LNP database capacity. There are three methods by which this needed database capacity can be achieved and are explained in this section.

4.11 Conclusion

The ITN Task Force found it necessary to select a single ITN pooling architecture in order to proceed with this analysis.

Based upon preliminary information, the ITN Task Force chose the alternative that does not treat available pooled TNs as ported TNs. The primary factor that contributed to the selection of this architectural alternative was SP concern about the capacities of the LNP Network Databases (SCP and STP) required if all available TNs in the PAS were treated as ported.

There are multiple technical reasons why SPs require access to an adequate SP TN inventory. Some of these include service negotiation and service activation. Current and planned network elements and systems for both wireline and wireless SPs are not designed to operate without the presence of a SP inventory. Modifications necessary to accommodate having no SP inventory may complicate and could affect implementation of ITN pooling.

There are additional items that must be addressed before ITN pooling could be implemented. These include details regarding the architecture, the transaction throughput and capacity concern, numerous guidelines issues, etc. It is believed that with industry commitment to the proposal, 4-6 years may be required to implement ITN pooling, depending upon the receipt of a regulatory order in the first 1-2 years. If the regulatory body with appropriate jurisdiction does not issue its decision to require ITN pooling within the first one to two years, additional time (beyond the four to six years) may be needed to complete the implementation of ITN pooling.

It should be noted that no qualitative or quantitative analysis of either the costs or the benefits of ITN pooling was performed to support the conclusions in this report. The conclusions are based upon information available at the time that the report was prepared and the informed judgement of subject matter experts involved in the preparation of this report. As additional information becomes available, the conclusions may be modified.

4.12 Definitions

This is a brief description of Service Provider Number Portability to explain terms which appear in the ITN pooling document

SP Number Portability (a.k.a. Local Number Portability or "LNP") is the network capability to move an individual TN from one switch to another (but it does not permit customer movement across a rate area boundary). That is, the NPA-NXX of a TN no longer reliably points to the serving switch, but it still accurately indicates the end-user's rate area.

Call routing for any TN which is ported relies on a Location Routing Number ("LRN") in the form of an NPA-NXX-XXXX where the NPA-NXX is one that is assigned to the switch actually serving the ported TN, and the last XXXX is simply used to populate the standard address format and is not used for number routing.

LNP-capable switches distinguish between NXX codes that may involve ported TNs ("portable NXXs") and those NXX codes that are not open for porting TNs ("non-portable NXXs"). For every call to a TN having a portable NXX, the switch interrupts call processing and launches a query to its network's LNP database to determine the NPA-NXX to use for routing. Inter-LATA calls that involve an intermediate network, are still routed based on the caller's PIC; the LNP database query is done by the intermediate network rather than the originating network.

LNP was envisioned as a means for an end-user to move from one SP to another. However, LNP could also be used to move an end-user between switches within the same SP's network, for example, to accommodate a customer's move outside his current serving wire center, within the same rate area, without requiring a loop extension or TN change. To accommodate LNP, the network is modified to add LNP databases that are queried by the switches during call processing.

Each SP's LNP databases are updated based on information received from a third-party NPAC SMS. The NPAC SMS is updated by the SPs directly involved in each customer's move, with the changes being sent to NPAC SMS each time a ported TN cut over is completed. The updating of LRN information for ported TNs thus occurs in near real time.

Inter-switch call routing is done on a 6-digit basis, e.g., it is based on the NPA-NXX of the dialed number. If the called number is not ported, the LNP database response merely reflects the dialed number sent in the query, i.e., the response tells the switch to route on dialed digits. However, if the number is ported, the database responds with a 10-digit LRN instead. The LRN acts as a surrogate for the called number during the inter-switch routing phase of the call.

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Article 1. ARCHITECTURE PLAN FOR INDIVIDUAL TELEPHONE NUMBER POOLING, PREPARED BY MCI-WORLDCOM

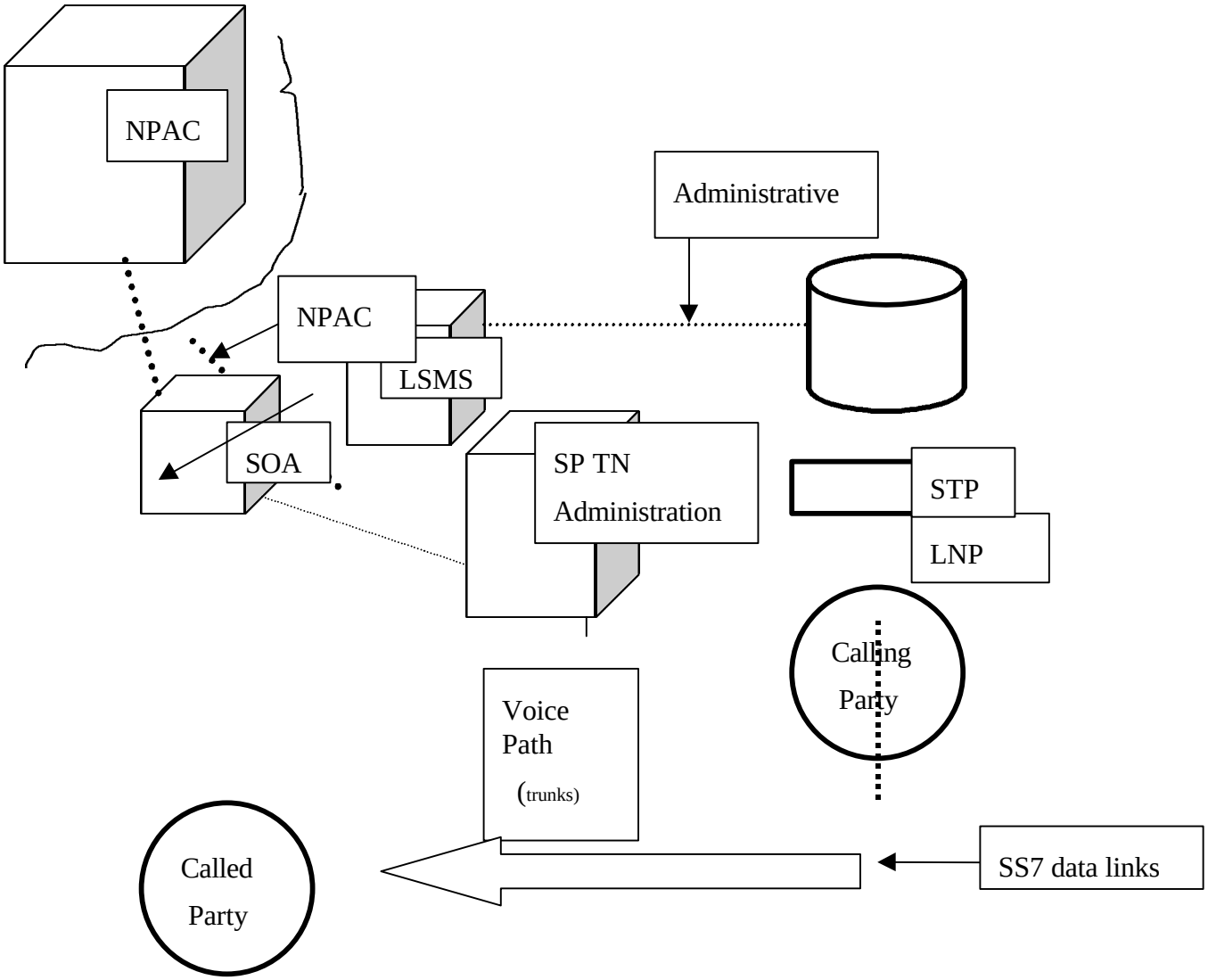
INTRODUCTION

This document describes the pooling of telephone numbers, at the individual telephone number ("TN") level, to provide number relief at switches equipped for Service Provider Number Portability (known as *local number portability* or "LNP"). The design relies on the current capabilities required to port working and non-working TNs, but requires that participating SPs enhance their Operational Support Systems and that a third-party TN Pool Administrator be established. Number relief for switches that are not LNP-capable would be provided in the current NXX-level assignment manner.

HIGH LEVEL LNP ARCHITECTURE VIEW

(For Illustration)

The following diagram describes the basic LNP architecture that forms the basis for TN pooling.



ITN POOLING ARCHITECTURE

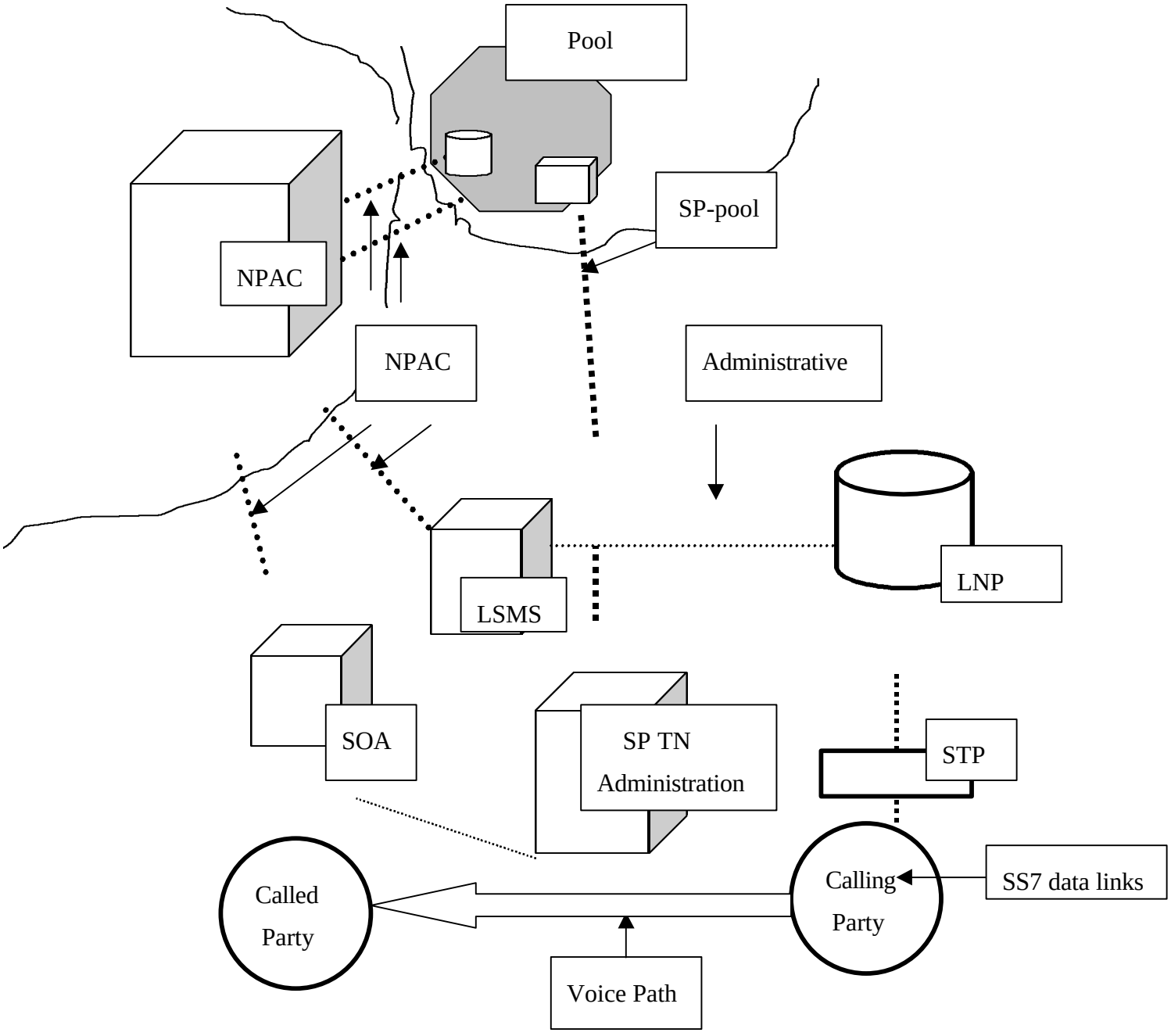
The foundation for the individual TN pooling arrangement described in this Report is that all pooled numbers are "ported" numbers. Thus, numbers in the pool have an LRN which indicates they are in the pool. The "pool" LRN is an unassigned NPA-NXX for the TN's

NPA, such as a service code or other values agreed to by industry; it should not be an NXX-NPA combination suitable for assignment of telephone numbers.

Treating spare pooled numbers as ported to the pool, rather than treating the numbers as being assigned to the code-assignee as is done today, avoids delivery of traffic to code-assignee switches and the resulting concerns about unfair requirements to provide intercept treatment for vacant numbers not actually dedicated to a provider's network. It also avoids introduction of "cause code 26" situations, where calls to vacant pooled TNs are routed as ported numbers to switches in which the TNs are not active.

ITN Pooling Architecture Diagram

The following diagram illustrates the change from current LNP architecture introduced by the individual number pooling arrangement described in this Report.



CHANGES NECESSARY TO INTRODUCE ITN POOLING

Briefly, the changes necessary to introduce individual TN pooling are as follows:

- Establishment of a TN Pool Administrator.
- Modification of Service Provider Operational Support Systems ("OSS")
- to accommodate porting of non-working TNs in addition to their ability already to accommodate porting reserved numbers,

to treat disconnected non-ported TNs as if they had been ported, and

- c. to interact with the industry pool inventory for selection of TNs for assignment to end-users.
    - Snap-back by NPAC to pool of all TNs whose NXXs are in pool.
    - Industry acceptance of the intercept announcement used for calls to unassigned NXXs as being adequate for use on calls made to unassigned pooled TNs, i.e., instead of using blank number intercept announcment for calls to non-working numbers.

The interaction of the Service Providers, the TN Pool Administrator, the NPAC, and the CO Code Administrator are summarized below. More detailed discussions appear later in the "Architecture Details" section.

ARCHITECTURE ASSUMPTIONS

With this arrangement, it is possible to have only an Industry number pool, with no Service Provider inventory of available TNs. This would require that Service Providers' number administration systems interface with the pool on a near real time basis, to select numbers while customers were on the line, awaiting their number assignments.

An exclusive industry pool is not a necessary condition for individual TN pooling, however, and Service Providers could make number selections for later use at regular intervals, such as each evening during low load periods. Thus the Service Provider inventory would represent estimated requirements for only the next few days or so, and would be augmented periodically to maintain that level of inventory.

TNs drawn from the pool look like ported TNs to the network, even when they are used in the code-assignee's switch. TNs that are *not* drawn from the pool look like ported numbers only if they actually are ported.

The "pooled" number indication to NPAC, required in thousands block pooling, is not necessary for individual TN pooling but could be retained.

Pooled numbers appear in the ported number databases whether or not they are working. If a number is in the pool, it will have an LRN which designates "pool." Thus if an end-user dials an available number in the pool, or a number drawn from it but not yet active, the switch doing an LNP database dip will receive the "pool" LRN. This LRN is an NPA-NXX combination causing switch to select route to the vacant NXX intercept

announcement. The call would not be advanced beyond the switch doing the LNP database dip.

All active TNs in portable NXXs go to the pool after being disconnected. Reserved numbers are returned to the pool when the end-user with whom they are associated disconnects his service or they are otherwise no longer reserved. Disconnected numbers are returned to the pool when the aging process is complete and specific disconnected number intercept arrangements no longer are required. In this way the current code-assignee based number inventory arrangement gradually is replaced by the individual TN pooling arrangement. If SP inventories are to be permitted, they may be made up only of TNs drawn from the pool.

Future TNs from new, portable NXXs go directly to the pool. Future NXXs are assigned to a switch by the Pool Administrator, for reasons unrelated to spare number requirements at that switch. That is, NXX assignments no longer are inextricably related to the distribution of numbering resources. However, NXX and the related TN assignments would continue in the current manner for those switches which are not LNP-capable.

No new inputs to LERG are required for individual TN pooling. Modifications made to LERG for NXX-X assignment no longer would be needed if existing NXX-X assignment arrangements were reversed.

Changes to SPs' OSSs are required, particularly to cause treatment of disconnected non-ported number to trigger an "old SP Create" message to NPAC for disconnected non-ported numbers. Changes also are required to permit the SPs' OSSs to interact directly with the pool inventory system, to make number selections. This OSS development is affected by a decision on whether there is to be real-time interaction between SPs and the industry number pool or periodic interactions and small SP-specific TN inventories.

PARTICIPANT RESPONSIBILITIES

Pooling Administrator

The TN Pool Administrator would have conventional SOA/LSMS interfaces with the NPAC and would have data link connections with each SP, to permit viewing of the available TN inventory and selecting available TNs.

The TN Pool Administrator would be authorized to submit requests for a new NXX assignments. The Pool Administrator would provide rate area and switch assignment information to the CO Code Administrator as needed for a new NXX assignment.

The Pool Administrator's automated system would recognize notice of "old SP Create" to mean non-ported TN is being contributed to the pool. It would recognize notice of "new SP Create" as meaning TN is being taken from the pool, with the subsequent NPAC broadcast indicating the TN was placed in service.

Service Providers

SPs would indicate TN selections over their data links to the Pool Administrator, but "take" the selected numbers through conventional porting methods via the NPAC.

The SPs would return disconnected pooled numbers through conventional disconnection of ported TN method. However, when a disconnected non-ported TN is sent to the pool, the method used is like that of a conventional port, where the new SP is the pool. That is, the SP would generate an "old SP Create" message to the NPAC each time it disconnected a non-pooled TN.

Pooled TNs reserved by an SP for a specific customer remain with the Pool Administrator until needed. The port is not done until the SP plans to activate the TN for the specific customer for whom it was reserved. This approach avoids the intercept traffic issues mentioned earlier.

NPAC

It appears that NPAC interactions are largely unchanged. For example, although the NPAC will need to snap-back disconnected ported numbers to the pool rather than to the NXX-assignee, this may require no change in software.

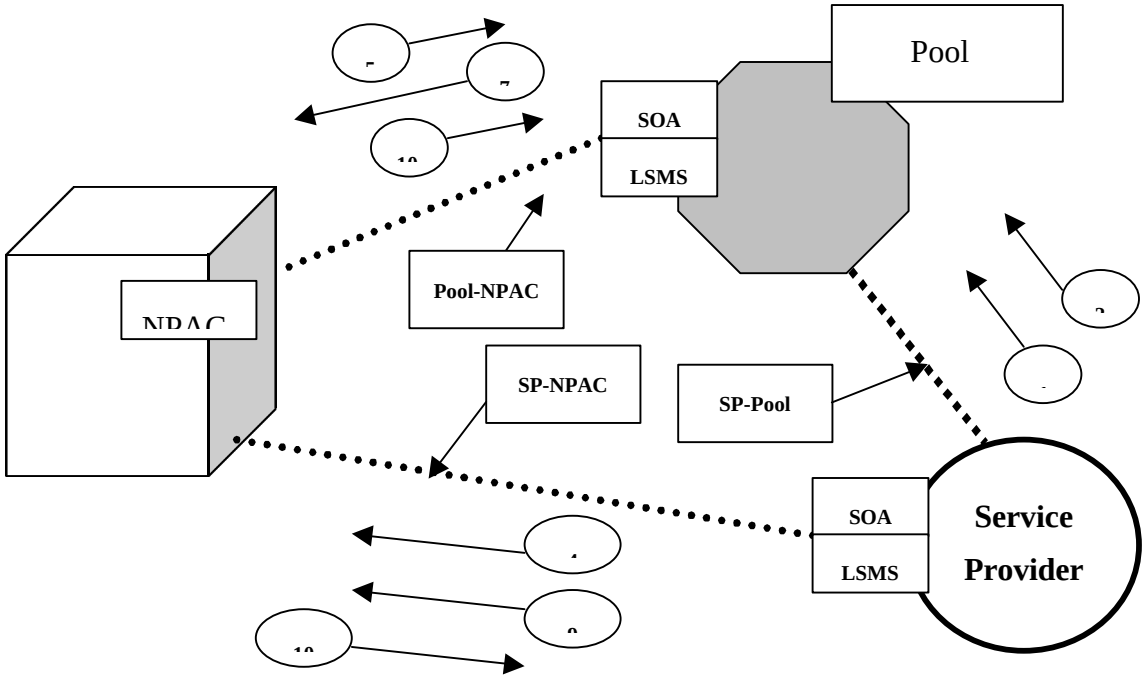
CO Code Administrator

The CO Code Administrator would need to recognize the TN Pool Administrator as being authorized to request a new NXX assignment and the source of information about the rate area and switch assignment for a new NXX.

4.13 Pooling “Event” Descriptions

More details of the individual TN pooling architecture are provided in the descriptions of pooling participants' interactions on the following pages.

4.14 SP Draws TN From Pool



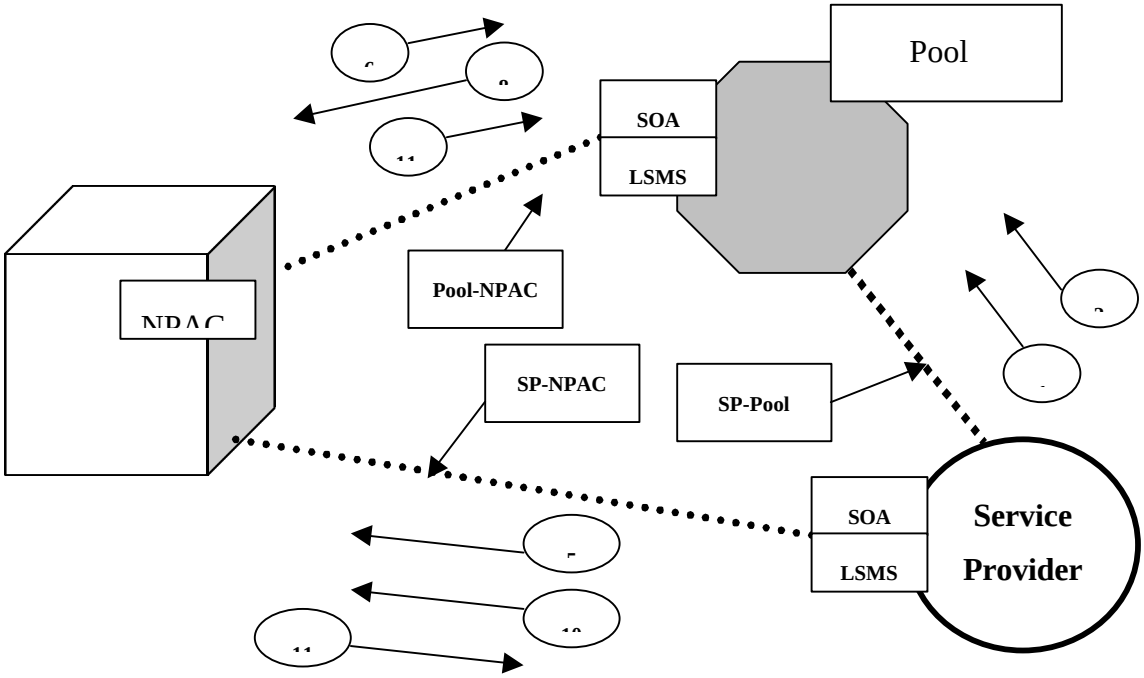
1. SP establishes connection to pool via SP-pool data link, to view inventory.
2. SP selects TNs from pool inventory.
3. Pool removes selected TNs from "available" inventory.
4. SP sends "new SP Create" to NPAC for the selected TNs.
5. NPAC sends "new SP Create" notice to pool.
6. SP enters TNs into its OSSs as "available."

   Pool recognizes "new SP Create" notice means selected TNs being taken.

7. Pool sends "old SP Create" to NPAC.
8. SP assigns number to end-user from its TN inventory.
9. SP sends "Activate" to NPAC when TN is placed in service.
10. NPAC broadcasts ported TN information.
11. NPAC broadcast shows pool that TN no longer is in SP inventory.

If only an industry inventory of spare numbers is maintained, then the SP selection of TNs from pool inventory described above must happen in near real-time, while customer is on line with SP customer representative. The messages to NPAC need not begin until customer has completed his order.

SP Reserves Pooled TN For Specific Customer



1. SP establishes connection to pool via SP-pool data link, to view inventory.
2. SP selects TNs, indicating TNs reserved for specific customer.
3. Pool removes selected TNs from "available" inventory, treats as reserved.
4. SP enters TNs into its OSS as reserved.

   Later, but within industry guidelines for time limits on TN reservations:

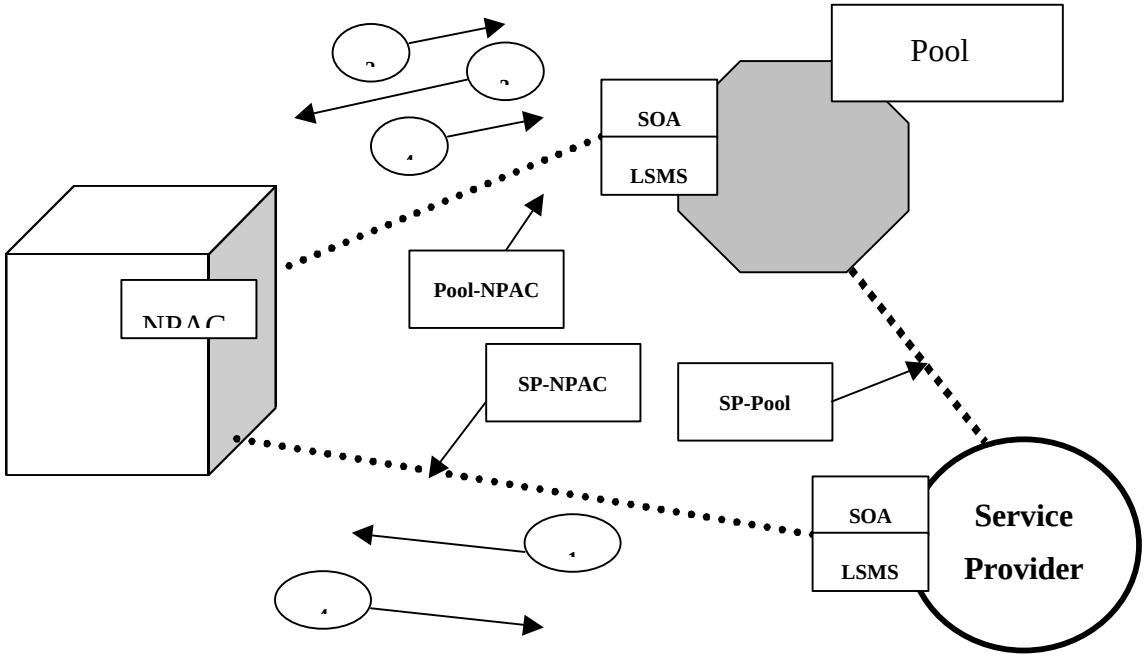
5. SP sends "new SP Create" to NPAC, for reserved TNs becoming active.
6. NPAC sends "new SP Create" notice to pool.
7. SP enters TNs into its OSSs as "available."

   Pool recognizes "new SP Create" notice means selected TNs being taken.

8. Pool sends "old SP Create" to NPAC.
9. SP assigns reserved TN to end-user from its inventory.
10. SP sends "Activate" to NPAC when TNs placed in service.
11. NPAC broadcasts ported TN information.

    NPAC broadcast shows pool that TNs no longer are in SP inventory.

SP Disconnects Ported TN



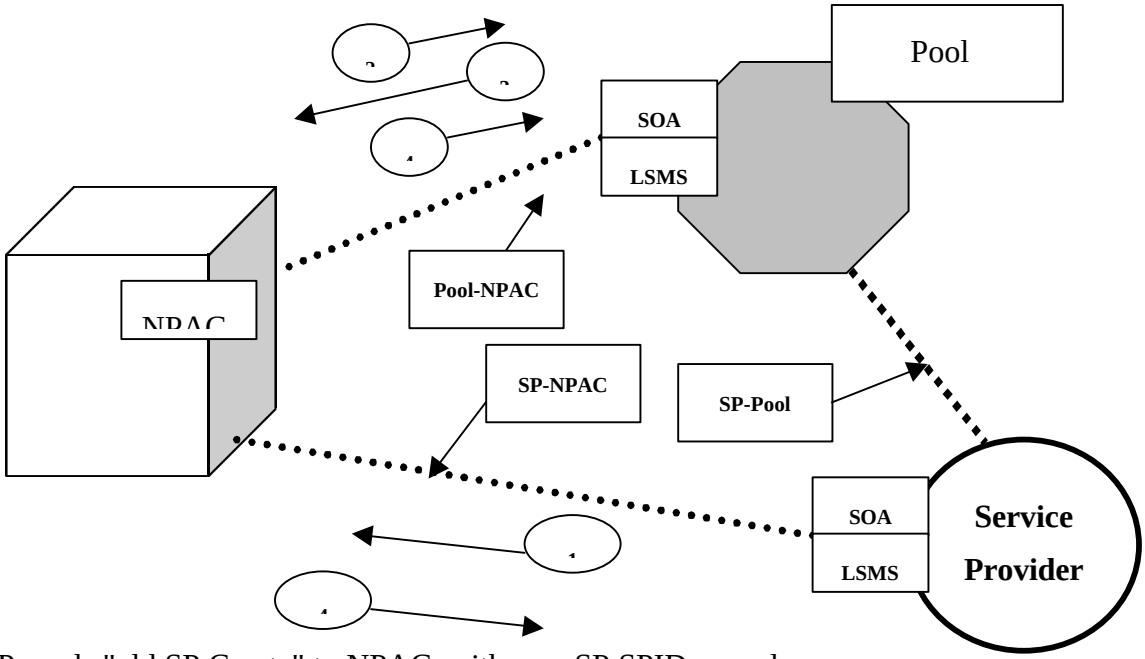
1. SP sends "Disconnect" to NPAC.
2. NPAC sends "Snap-back" message to pool.

   Pool recognizes that ported TN is being contributed or returned to pool.

   NPAC message to pool shows customer disconnect date and effective date.

   Pool withholds TN from inventory until effective date.
3. Pool sends "intra-SP Port" messages to NPAC.
4. NPAC broadcasts ported TN's new information, showing LRN = pool.

SP Disconnects Non-ported TN



1. SP sends "old SP Create" to NPAC, with new SP SPID = pool.
2. NPAC sends "old SP Create" notice to pool.

   Pool recognizes that non-ported TN is being added to pool.
3. Pool sends "new-SP Create" and "Activate" to NPAC.
4. NPAC broadcasts ported TN information, showing LRN = pool.

4.15 Participant “Function” Descriptions

More details of the individual TN pooling architecture are provided in the following descriptions of each pooling participant's functions.

4.16 Pooling Administrator

Allows LECs to indicate selected TNs in real time from pool inventory.

[SP views and selects via SP-pool data link]

Displays pooled TN inventory.

[inventory shows disconnect date for previously used TNs]

[inventory shows rate area and other NXX-level restrictions]

Allows selection of TNs to reserve for future use by specified customer.

[SP reserves TNs via SP-pool data link]

[SP indicates customer identity for each TN being reserved]

[P.A. starts timer for each TN reservation]

Augments pool as needed, obtains new NXXs from Code Administrator.

[P.A. indicates rate area, switch assignment with NXX requests]

Maintains historical data on TN ports from pool.

[data needed to support third-party audits]

Receives "new SP Create" notice when SP pulls selected TNs from pool.

[occurs only after SP has selected TN via SP-pool data link]

[happens when SP makes TN available for its systems to assign, or TN reserved for specific customer's future use is to be activated]

Sends "old SP Create" to NPAC when "new SP Create" notice received.

[this is how pool actually releases TNs]

[this allows subsequent "Activation" by SP]

[note: LRN = pool until SP issues "Activate" to NPAC]

Adds TN to pool inventory when effective date shown in "Snap-back" notice is reached. *

[TN was ported; TN now being contributed or returned to pool]

* If snap-back to pool of a ported TN does not result in NPAC's automatically generating a "Create" broadcast, with LRN = pool, then upon receiving the snap-back notice, the pool sends "intra-SP Port" and "Activate" to NPAC when the snap-back notice received. This is done to make the TN a ported TN, with LRN = pool.

Sends "new-SP Create" and "Activate" to NPAC when "old SP Create" notice received.

[TN was not ported; TN now being contributed to pool]

NPAC

- Assumes snap-back of any number in a pooled NXX means return to pool.
- Broadcasts "Create" (LRN = pool) for snap-back to pool situations.

[or NPAC may simply send snap-back message to pool and rely on pool to initiate "intra-SP Port" and "Activate" messages]

- Notifies pool whenever "old SP Create" shows new SP SPID pool.

[for initial entry of *non-ported* TN to pool, due to a disconnection]

- Recognizes pool SPID as valid old SP SPID for any portable NPA-NXX.
- Service Provider
- Views pool TN inventory.

[views via SP-pool data link]

[indicates selection of desired TNs]

- Selects TNs to reserve for customer future use.

[reserves via SP-pool data link]

[indicates TNs reserved for a specific customer's future use]

[provides customer identity for TNs reserved for that customer]

- Sends "new SP Create" to NPAC, to draw selected TNs from pool.
- Sends "Activate" to NPAC when TN obtained from pool is put in service.
- Sends "Disconnect" to NPAC when ported TN is disconnected.

[snap-back process sends ported TNs to pool]

- Sends "Old SP Create" to NPAC when non-ported TN is disconnected.

[this notifies pool that non-ported TN is ready to enter pool]

CO Code Administrator

- Responds to NXX assignment requests from Pool Administrator for rate areas defined as having individual TN pooling.

IMPLEMENTATION

Except for those NXXs assigned to provide number relief in switches that are not LNP-capable, all TNs derived from future NXX assignments are placed in the pool.

Existing working, reserved, and aging numbers should be "ported" to the pool when they become eligible for re-assignment.

A large portion of the embedded, currently active non-pooled TNs would enter the pool eventually through normal churn over the next few decades. The process of migrating the embedded number base to the pool could be accelerated at any time, however, by defining the remaining embedded, unavailable numbers as pooled, i.e., by defining them as ported TNs using appropriate messages to NPAC without waiting for a disconnection event to move each number into the pool.

REPLACE THIS PAGE WITH:

ATTACHMENT: 2-4

TITLE: Lockheed-Martin - ITN Pooling Proposal

Microsoft Power Point

Article 2. ARCHITECTURE PLAN FOR INDIVIDUAL TELEPHONE NUMBER POOLING, PREPARED BY AT&T

Individual TN Pooling – Introduction

This document describes the pooling of telephone numbers, at the individual telephone number ("TN") level, to provide number relief at switches equipped for Service Provider Number Portability (known as *local number portability* or "LNP")

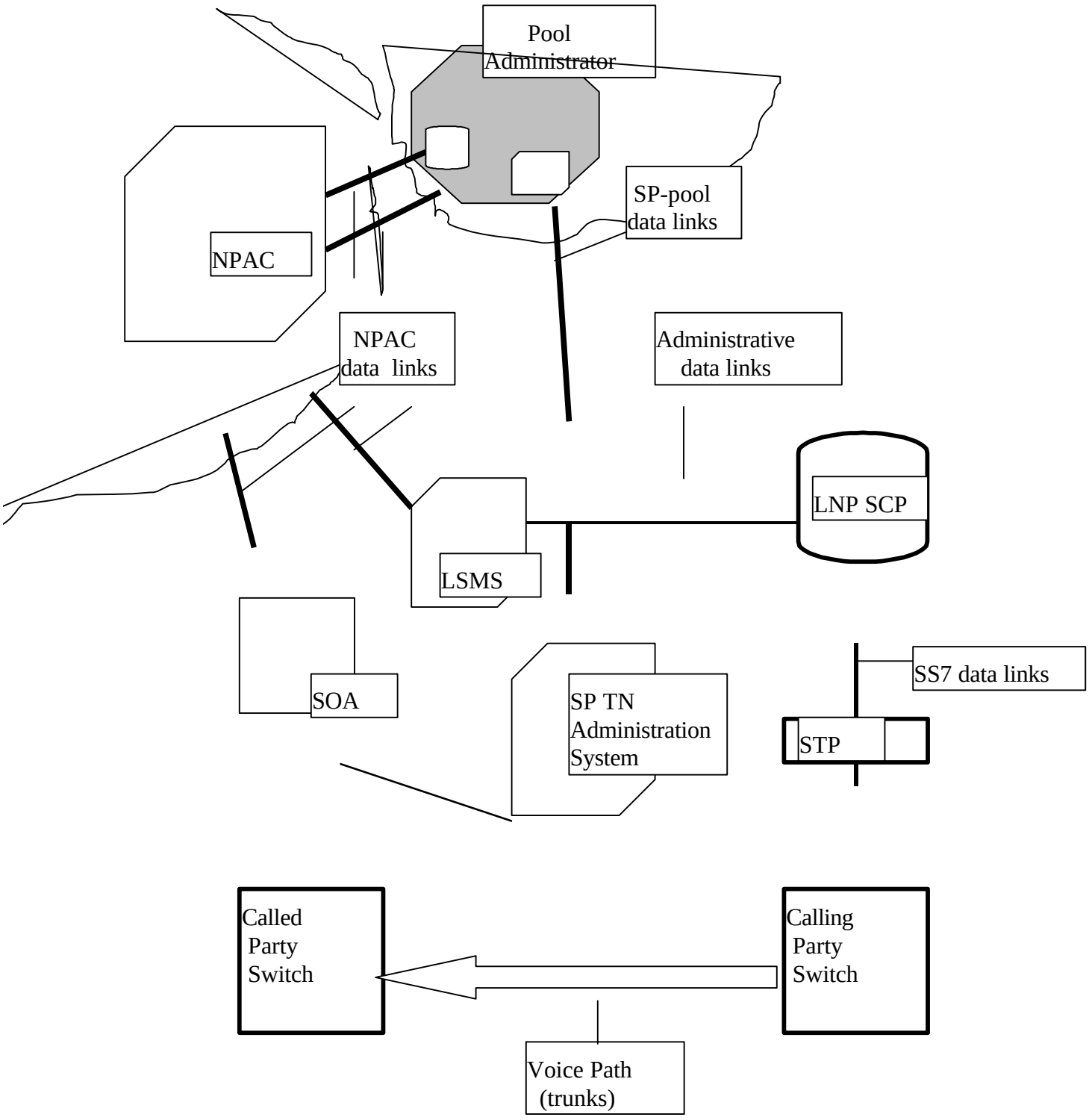
ITN Pooling Architecture

The foundation of individual TN pooling is that all pooled numbers are available to all members of the industry. A TN Pool Database that is accessible to all members of the industry allows for the separation of administrative treatment and network treatment of numbers.

Under this proposal vacant numbers would be default routed for vacant treatment and the TN pool would have sufficient administrative authority to port the vacant numbers to the appropriate service provider. This situation is different from the port-on-demand type of 1000s block number pooling in that all carriers, including the one providing the vacant treatment, have access to the numbering resources until they are either assigned to a customer or put into a service provider inventory. Since vacant calls are default routed; cause code 26 is not an issue. No changes will need to be made to the announcement for an invalid NPA-NXX.

ITN Pooling Architecture Diagram

The following diagram illustrates the change from current LNP architecture introduced by the individual number pooling arrangement described in this paper.


Pool
Administrator
SP-pool
data links
NPAC
NPAC
data links
Administrative
data links
LNP SCP
LSMS
SOA
SP TN
Administration
System
SS7 data links
STP
Called
Party
Switch
Calling
Party
Switch
Voice Path
(trunks)

Changes Necessary to Introduce TN Pooling

Briefly, the changes necessary to introduce individual TN pooling are as follows:

(1) Establishment of a TN Pool Administrator.

(2) Modification of Service Provider Operational Support Systems ("OSS")

a. to accommodate porting of non-working TNs in addition to their ability already to accommodate porting reserved numbers,

b. to treat disconnected non-ported TNs as if they had been ported, and

c. to interact with the industry pool inventory for selection of TNs for assignment to end-users.

(3) Administrative Snap-Back to pool of all TNs whose NXXs are in pool.

The interaction of the SPs, the TN Pool Administrator, the NPAC, and the CO Code Administrator are summarized below. More detailed discussions appear later in the "Architecture Details" section.

Architecture Assumptions

Pooled Numbers that are in the industry pool are not in the LNP database.

If a number is drawn from the pool and is to be used on the LERG assigned switch the carrier has the option of putting the number in the NPAC database to make it look like a ported number, they are not required to do this. TNs that are *not* drawn from the pool look like ported numbers only if they actually are ported.

All active TNs in portable NXXs administratively go to the pool after being disconnected. Reserved numbers are returned to the pool when the end-user with whom they are associated disconnects his service or they are otherwise no longer reserved. Disconnected numbers are returned to the pool when the aging process is complete and specific disconnected number intercept arrangements no longer are required. In this way, the current code-assignee based number inventory arrangement gradually is replaced by the individual TN pooling arrangement. SP inventories will be made up only of TNs drawn from the pool.

No new inputs to the LERG are required for individual TN pooling. Modifications made to the LERG for NXX-X assignment no longer would be needed if existing NXX-X assignment arrangements were reversed.

Participant Responsibilities

Pooling Administrator

The TN Pool Administrator would have conventional SOA/LSMS interfaces with the NPAC and would have data link connections with each Service Provider, to permit viewing of the available TN inventory and selecting available TNs.

The TN Pool Administrator would be authorized to submit requests for a new NXX assignments. The Pool Administrator could provide rate area and switch assignment information to the CO Code Administrator if the Service Provider for the LERG assigned switch requests the Pool Administrator to do so.

The Pool Administrator's automated system would recognize notice of "Disconnect" to mean a TN is being contributed to the pool. It would recognize notice of "new SP Create" as meaning a TN is being taken from the pool.

Service Providers

The SPs would indicate TN selections over their data links to the Pool Administrator, but "take" the selected numbers through conventional porting methods via the NPAC.

The SPs would return disconnected pooled numbers through conventional disconnection of the ported TN method. When a disconnected non-ported TN is sent to the pool, the

method used is like those of conventional disconnects. The NPAC must recognize that this is a disconnect of a non-ported number and only notify the Pool.

NPAC

Two specific changes will need to be made to the NPAC to support ITN pooling. The first change is that either the LERG assigned carrier or the ITN pool may act as the old service provider on a port. The second change is that all disconnect messages sent from service providers will be forwarded to the pool, but only those actually associated with numbers in the LNP database will be sent to the industry.

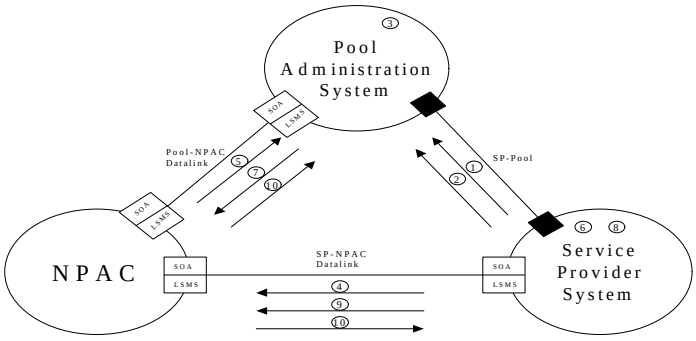
CO Code Administrator

The CO Code Administrator will need to recognize that a carrier may request that the TN Pool Administrator be authorized to request a new NXX assignment and be the source of information about the rate area and switch assignment for a new NXX. The Service Provider may elect to supply this information themselves.

Pooling "Event" Descriptions

More details of the individual TN pooling architecture are provided in the descriptions of pooling participants' interactions on the following pages.

SP Draws TN From Pool



1) SP establishes connection to pool via SP-pool data link.
2) SP requests TNs from pool inventory.
3) Pool removes selected TNs from "available" inventory.
4) SP sends "new SP Create" to NPAC for the selected TNs.

5) NPAC sends "new SP Create" notice to pool based on the service provider ID in the “new SP Create” message.

6) SP enters TNs into its OSSs

7) Pool recognizes "new SP Create" notice means selected TNs being taken.

8) Pool sends "old SP Create" to NPAC.

9) SP assigns number to end-user from its TN inventory.

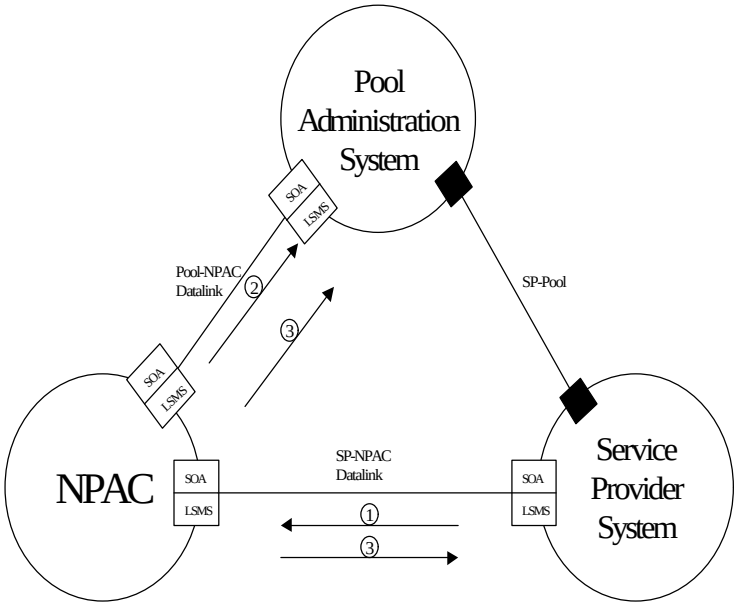
10) SP sends "Activate" to NPAC when TN is placed in service.

11) NPAC broadcasts ported TN information.

12) NPAC broadcast shows pool that TN no longer is in SP inventory.

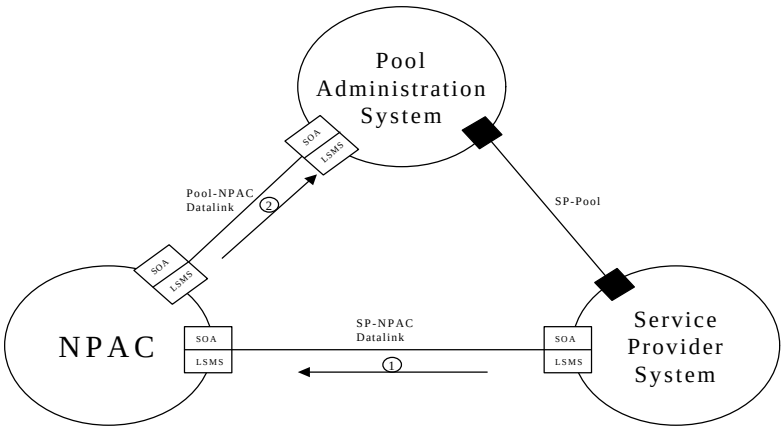
The messages to NPAC (step 4) need not begin until a number has been assigned to a customer. Steps 1-3 are used to establish SP pools.

SP Disconnects Ported TN



1) Sends "Disconnect" to NPAC.
2) NPAC sends "Snap-back" message to pool.
3) Pool recognizes that ported TN is being contributed or returned to pool.
4) NPAC message to pool shows customer disconnect date and effective date.
5) Pool withholds TN from inventory until effective date.
6) NPAC broadcasts “Delete” Message to the industry on date indicated in “Disconnect” message from SP.

SP Disconnects Non-ported TN



1. SP sends “Disconnect” to NPAC
2. NPAC sends “Snap-back” message to pool.
3. Pool Recognizes that non-ported TN is being contributed to the pool.
4. NPAC message to pool shows customer disconnect date.
5. Pool withholds TN from inventory until industry agreed aging period is over.
6. NPAC recognizes that this is not a ported number and does not send “Disconnect” message to the industry.

Participant “Function” Descriptions

More details of the individual TN pooling architecture are provided in the following descriptions of each pooling participant's functions.

Pooling Administrator

- Allows SPs to indicate selected TNs in real-time from pool inventory.
- Allows SPs to build SP TN inventories
- Displays pooled TN inventory.
- Maintains historical data on TN ports from pool.

- Receives "new SP Create" notice when SP activates TNs from pool.
- Sends "old SP Create" to NPAC when "new SP Create" notice received.
- Adds TN to pool inventory when effective date shown in "Snap-back" notice is reached. *

NPAC

- Assumes snap-back of any number in a pooled NXX means return to pool.
- Recognizes pool SPID as valid old SP SPID for any pooled NPA-NXX.

Service Provider

- Draws down numbers from pool to establish SP inventories.
- Sends "new SP Create" to NPAC, to draw selected TNs from pool.
- Sends "Activate" to NPAC when TN obtained from pool is put in service.
- Send “Disconnect” to NPAC when any TN is disconnected.

CO Code Administrator

Responds to NXX assignment requests from Pool Administrator for rate areas defined as having individual TN pooling.

MINORITY OPINON OF MCI WORLDCOM AND AD HOC ON ITN POOLING

As emphasized in the accompanying minority opinion on 1000 block pooling, MCI WorldCom and the Ad Hoc Telecommunications Users Committee (“Ad Hoc”) support wholeheartedly the FCC’s goal of implementing telephone number pooling as a means to optimize the North American Numbering Plan (NANP) and enhance competitively neutral administration. Individual telephone number (ITN) pooling clearly represents the best potential method for improving number utilization, relieving NPA exhaust and allowing competitive parity in access to numbering resources. If implemented correctly, ITN pooling would result in maximum number administration efficiency within a rate area and allow completely neutral access to the entire number resource.

1. Number Optimization Benefits of ITN Pooling

It is extremely disappointing that the NRO was reluctant to reflect the full benefits of ITN pooling in improved number utilization, competitively neutral access to the number resources, and consumer choice of numbers. While the exact benefits of either ITN or 1000 block pooling cannot be quantified — and no quantification is attempted by NRO —

it is an obvious and logical conclusion that administering numbers on an individual basis would provide substantial improvements over administration in larger number blocks. ITN pooling also increases the ability of the NANPA to accurately forecast depletion and exhaustion of available numbers in NPAs. This is because under ITN pooling, number administrators can maintain current, accurate data on actual number utilization, instead of relying on carrier reports and estimates, thus increasing the reliability of area code projections and further reducing the costs, burdens and chaos associated with NPA relief.

2. Unrealistically Extended Implementation

The 4-6 year timeframe projected for ITN implementation is grossly exaggerated and will significantly delay the date by which number administration would become competitively neutral. No other industry effort of comparable magnitude (e.g., LNP, 800 portability, equal access, etc.) has required such an extended interval. MCI WorldCom and Ad Hoc believe, based on their internal assessments, that with a firm regulatory deadline and resource prioritization, ITN pooling could be accomplished in as little as 3 years. Indeed, as ITN pooling would be built on the existing LNP databases and resources, its implementation could likely prove far simpler than prior industry changes that required the development and deployment of new, interconnected database systems. And to the extent that the claimed inability to rapidly implement ITN is attributable to the ILECs' failure to provide sufficient LNP capacity to support even a modest level of actual competition, such limitations must not be compounded by serving as a basis for unnecessary delay in ITN implementation.

3. Inventory Levels

The report fails to recognize the critical importance of developing an ITN pooling system that comes close to eliminating service provider inventories. Although a minimal inventory level may be necessary for reasons of carrier and customer convenience, the competitive and number optimization promise of ITN is only realized where these inventories are held to an absolute minimum. In contrast, while not making a specific recommendation on inventory levels, the NRO report discussion of inventories focuses almost entirely on reasons for maintaining the status quo for service provider inventories.

4. Unassigned Number Portability

Unassigned Number Portability (UNP) provides a reasonable short-term alternative to full-blown ITN and should be pursued as an alternative to area code splits or overlays where NPA exhaust is imminent. UNP requires essentially the same administrative mechanisms, operations support systems, and data base and SCP capacities as LNP, assuming of course that LNP is implemented in contemplation of actual, substantive competition rather than merely as a token compliance with the FCC's LNP requirements. Whatever costs and administrative burdens ILECs may encounter to implement UNP pale in comparison with the costs and burdens that consumers and the economy generally must suffer as a result of area code splits or overlays.

CONCLUSION

MCI WorldCom and Ad Hoc recognize that ITN pooling may appear aggressive to some dominant firms in the industry, and that regulators could fear that ITN pooling is too "radical" a change in number administration. These concerns can be addressed directly, because carriers and policy makers must understand that efficient number utilization and competitively equal access to numbering resources cannot be achieved with incremental "tweaks" to current industry practices. Number assignment and utilization, as developed in the local exchange industry over several decades, incurs tremendous waste of these finite numbering resources. Unless and until industry and policy makers are willing to take a radically new approach and implement a major overhaul of number utilization, the tremendous costs of repetitive NPA exhaust will continue to be imposed on all telecommunications carriers, and consumers, in the United States and throughout North America. The way to accomplish this critical modification is by beginning immediately to develop an ITN pooling solution to the accelerating depletion of telephone numbers in this country, rather than delaying such fundamental change with other, less effective approaches to number pooling. In conjunction with complementary long-term measures such as rate center consolidation, ITN pooling can serve as a key element, perhaps the most important, in conservation of numbering resources and the promotion of truly competitive telecommunications markets.

5 THOUSANDS BLOCK NUMBER POOLING

5.1 DESCRIPTION

5.1.1 Thousands-Block Pooling Application

Thousands-Block pooling involves the allocation of blocks of sequential telephone numbers within the same NXX to different SPs and potentially to different switches, which serve customers within the same rate area[12]. All ten thousand numbers within each NXX continue to be assigned to one rate area, but are allocated among multiple SPs at the Thousands-Block (NXX-X) level. An example of this arrangement is shown below.

847-999-1XXX SP-1

847-999-2XXX SP-2

847-999-3XXX SP-3

etc.

[12] Rate area, as used herein, denotes the smallest geographic area used to distinguish rate boundaries.

Using this example, SP-1, SP-2, SP-3, etc., can each assign numbers from their allocated Thousands-Block within the 847-999 NPA-NXX, but only to customers residing within the designated rate area. 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.

The 847-999 NPA-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 assigned SP would be referred to as the LERG Assignee. The LERG Assignee, however, would only be permitted to assign numbers within the particular Thousands-Block or blocks that have been allocated to it.

5.1.2 Thousands-Block Pooling Architecture

The architecture used to support Thousands-Block pooling is the recently-deployed IN/AIN (Intelligent Network/Advanced Intelligent Network) system 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[13]. Number pooling is accomplished through the use of existing LNP data bases, which can provide specific routing information for blocks of numbers within the same NXX, but which have been allocated to different SPs. Each SP can independently assign numbers within their allocated Thousands-Block(s). If the SP is not the LERG-assignee, they must treat the assigned numbers as ported, populating them first within the LNP databases. 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. It also allows individual SPs to retain their own numbering inventory, albeit at a lower level, with which to assign telephone numbers to their customers.

5.1.3 Process Flows

Three different provisioning scenarios may be considered for the deployment of Thousands-Block number pooling:

- Port-On-Demand
- Pre-Port
- Activate-As-Needed

Port-On-Demand is a pooling deployment method whereby numbers within blocks allocated to a specific SP are ported only at the time they are actually assigned or reserved for a customer. Pre-Port is a method whereby all numbers within blocks allocated to a specific SP are ported by the effective date designated by the SP, so that they may be

[13] INC Initial Report to the North American Numbering Council (NANC) on Number Pooling, INC 97-1017-019.

(subsequently) assigned to customers in the same manner as other numbers within the SP's inventory. Activate-As-Needed is a method whereby numbers can be ported at the time the allocation is made to the SP, or at the time they are actually assigned or reserved for a customer, or at anytime in between.

An overview of process flows that may be required to support Port-On-Demand[14] include the following:

- Pooling Administrator responds to a request for additional numbers by allocating one or more Thousands-Blocks to the requesting SP.
- Pooling Administrator notifies the NPAC that a Thousands-Block has been allocated to a particular SP. The industry will be notified by a process yet to be determined.
- Requesting SP (the block-holder) issues a portability request to the NPAC, with appropriate LRN, point code and other information, for numbers within the allocated Thousands-Block, or as numbers are assigned or reserved for a customer.
- NPAC initiates an update of its database and downstream LSMSs for those numbers being ported.
- Code holder retains responsibility for default routing and unassigned number treatment for the allocated block.

An overview of process flows that may be required to support Pre-Porting[15] include the following:

- Pooling Administrator responds to a request for additional numbers by allocating one or more Thousands-Blocks to the requesting SP.
- Pooling Administrator notifies the NPAC that a Thousands-Block has been allocated to a particular SP. The industry will be notified by a process yet to be determined.
- Pooling Administrator or the requesting SP (the block-holder) issues a portability request to the NPAC, with appropriate LRN, point code, and other information for the allocated Thousands-Block.
- NPAC initiates an update process of its database and downstream LSMSs for all TNs within the allocated Thousands-Block.
- Code holder retains responsibility for default routing.

---

[14] Assumes the allocation is to an SP that is not the code holder.

[15] Also assumes the allocation is to an SP that is not the code holder.

- Block holder assumes responsibility for unassigned number treatment for the allocated block.

An overview of process flows that may be required to support Activate-As-Needed include the following:

- Pooling Administrator responds to a request for additional numbers by allocating one or more Thousands-Blocks to the requesting SP on an as needed basis.
- Pooling Administrator notifies the NPAC that a Thousands-Block has been allocated to a particular SP. Industry will be notified by a process yet to be determined.
- Requesting SP (the block-holder) issues a portability request to the NPAC, with appropriate LRN, point code and other information, on an as-needed basis, for numbers within the allocated Thousands-Block.
- NPAC initiates an update process of its database and downstream LSMSs.
- Code holder retains responsibility for default routing and unassigned number treatment for the allocated block.

Efficient Data Representation (EDR) permits the representation of a range of numbers in the SMS and SCPs, rather that the exclusive use of individual records.

The issue of disconnect treatment of a pooled number (commonly referred to as "snapback") arises in the case of an active pooled number which subsequently ports away into another SP's network. If the number then subsequently disconnects, the question arises of the disposition of that number needs to be addressed. Three options were initially identified: 1) snapback to the block holder; 2) snapback to the code holder; and 3) no snapback. In snapback to the block holder, upon a disconnect processed at the NPAC by the last serving provider, the number is ported back into the block holder's network where vacant number treatment is provided until the number is re-assigned. In snapback to the code holder's network, upon a disconnect processed at the NPAC by the last serving provider, the number is removed from the NPAC and SP SCPs, thus returning the number to default routing.

The first of these snapback options leaves the number within the assignment authority of the block holder regardless of where vacant number treatment is provided. The second option could leave assignment authority with either the code holder or the block holder. In the "no-snapback" option, no disconnect is sent to the NPAC, causing the number to remain in the last SP's network, where they provide vacant treatment and consider the number to be added to their inventory. This effectively transfers assignment authority of that number to the last SP's network.

The industry has reached consensus that snapback to the block holder will be the standard practice for network routing and TN administration in a Thousands-Block pooling environment.

5.2 Additional Assumptions

The following assumptions have been identified as appropriate for Thousands-Block number pooling:

- Pooled numbers within an NXX, as defined in the LERG, will only be assigned to customers residing within the same rate area. As such, each NXX will continue to be associated with one particular rate area, and one particular switch. The latter requirement is needed for default routing purposes, specifically 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.
- Switches that are assigned Thousands-Blocks from within pooled NXXs must be LNP capable. This capability is needed to launch LNP queries on calls to blocks allocated to other SP switches in order to provide proper call routing.
- Thousands-Block pooling can only be implemented in locations where and when LNP has or will be implemented, and by entities that have or will implement LRN LNP. Only those areas where LNP is or will be deployed can accommodate Thousands-Block number pooling.
- SPs offering local number portability in accordance with the Telecommunications Act of 1996, and as ordered by the FCC in CC Docket No. 95-116, or other applicable state and/or federal mandate, shall also participate in number pooling where number pooling is implemented.
- Carriers participating in Thousands-Block pooling shall be obligated to both contribute and draw TNs using only the Thousands-Block pooling process, in accordance with guidelines.
- All SPs that are LNP capable will donate number resources to participate in number pooling with other SPs sharing the same rate area boundary.
- A neutral, third party entity will be responsible for building, maintaining and administering each pool.
- Separate pools will be established for each rate area. Carriers sharing the same rate area boundaries will utilize resources from a common pool.

5.3 Implementation Timeline

The following section outlines the various high level tasks necessary to make Thousands-Block pooling a reality from the time a regulatory body with appropriate jurisdiction issues its decision to require implementation of thousand block pooling. Some components of the following timeline require formal regulatory guidance, including resolution of cost recovery issues.

In each task listed there is a broad-range estimate of the time period to complete each task. For most activities, a recommendation regarding the appropriate industry group or organization that could be delegated responsibility to achieve the listed task is indicated. These estimates are based on the experience of the participants in the preparation of this report, and do not represent firm commitments by the identified responsible group(s).

The estimated time line does not address the regulatory environment, e.g., the process and time period required for a regulatory order to deploy Thousands-Block pooling. In addition, the time line assumes that there would be an industry agreement in place for an appropriate industry group to perform the project management for Thousands Block pooling implementation.

What follows are the high level steps that are required to implement Thousands-Block pooling. The tasks that end in an asterisk (*) may be undertaken and accomplished prior to a mandate from a regulatory body with authority.

IMPLEMENTATION TIMELINE

TASK[16]	TIME PERIOD	RESPONSIBLE PARTY
Pre-Pooling Activities		
(Several of these activities can occur concurrently)		
Deployment of LNP	Per FCC Schedule	Industry
Analysis of current numbering resources and future numbering needs	Pre-Timeline	Industry, and regulatory bodies.
Pooling Timeline		
1. Selection of Neutral Pooling Administrator (PA)*	Complete	NANC
2. Industry Guidelines		
a. Development of Pooling Administration guidelines*	Sept. 1998	INC
b. Modification of related industry guidelines	Dec. 1998	INC
3. Selection of deployment method (s)*	Complete July 1998, Pre-port with EDR	NANC
4. NPAC SMS System requirements pre-port EDR*	Dec. 1998	NANC LNPA-WG
5. Development of Pooling Administration specifications and requirements*	(after 9/98)	TBD
6. Development of Pooling Administration Systems	TBD, (after no. 5 and regulatory mandate)	PA/Industry
7. SP modifications to LSMS and SOA	3-14 months, (after no. 4 and regulatory mandate)	SP/Vendors
8. Enhancements to SP OSSs	6-14 months, (after	SP/Vendors

[16] Additional tasks may be identified for wireline and wireless networks that might elongate the timeline.

		no. 3 and regulatory mandate)	
9.	Develop switch requirements for pooling*	TBD	T1S1.6
10.	Enhancements to SP switches		
	a. Implementation of switch enhancements (if needed)	6-12 months (after no. 9)	SP/Vendors
	1. b. Deployment and testing (if needed)	3-6 months (after no. 10)	SP/Vendors
11.	Enhancements to SP SCPs	6-12 months (after no. 4)	SP/Vendors
12.	Enhancements to TRA products		
	a. NRRIC develop requirements for TRA modifications*	Dec. 1998	NRRIC
	b. OBF develop requirements for TRA modifications*	TBD	OBF
	c. Modifications to LERG*	March, 1999, BCR Release Delivery	Bellcore
	d. Modifications to TPM	TBD	OBF
13.	Develop and deploy NPAC enhancements	32 weeks after SOW signed	LM/SP
	a. Testing	6 weeks (after no.11)	LM/SP
14.	Overall system testing	2 to 8 weeks	SP/PA/NPAC
15.	Beta test site/trial (if necessary)	TBD	TBD
16.	Establish the pool	8-12 weeks	PA/SP
17.	Cost allocation/recovery		
	a. Recommendation for PA cost recovery cost allocation*	Sept. 1998	Cost Recovery WG
	b. Resolution of all remaining cost allocation and recovery issues	TBD	Appropriate regulatory body

Tasks that end in an asterisk (*) may be undertaken and accomplished prior to a mandate from a regulatory body with authority.

The above timeline for deployment of nationally standardized Thousands-Block number pooling may not necessarily be consistent with the timelines used by those states implementing or testing state-specific solutions for Thousands-Block number pooling.

5.3.1 Pre-Pooling Timeline Description

5.3.1.1 Deployment of LNP

As stated in Section 2, it is assumed that Service Provider Number Portability has already been deployed within a particular service area prior to its consideration for number pooling. In its First Report and Order in Docket 95-116, the FCC established an implementation schedule for LNP in the top 100 metropolitan statistical areas (MSAs), which anticipated the completion of LNP within wireline carrier networks serving most major cities by the end of 1998. According to FCC Memorandum Opinion and Order WT98-27, wireless SPs are currently obligated to provide LNP in the top 100 MSAs on March 31, 2000, where requests exist on or before June 30, 1999.

5.3.1.2 Analysis of current numbering resources and future numbering needs

A decision to implement Thousands-Block number pooling within a particular NPA may be preceded by a detailed analysis of the current block utilization within the NPA. This may be accomplished by the submission of a data request to all SPs assigned numbering resources within the candidate NPA to obtain information on the number of spare and contaminated Thousands-Blocks[17], and their associated rate area. Determination of the number of spare NXXs within the NPA is also necessary. Such information is required to determine whether there are sufficient numbering resources available with which to create a numbering pool. If it is determined that insufficient resources exist, other relief measures should be considered in conjunction with pooling. A second data request, to obtain forecasts of future numbering demand (by Thousands-Block, and by rate area), is also essential to determine the utility of number pooling as a number optimization measure for the NPA[18]. Due to the sensitive and proprietary nature of the information being sought, issuance of the data requests and compilation of the responses may best be handled by the neutral Pooling Administrator. Only information that represents the aggregated responses of all SPs in a pooling area should be made publicly available. Ongoing analysis during the implementation interval will be required to maintain up-to-date information regarding potential supply and demand.

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[17] Contamination refers to the number of working and reserved numbers within a thousand block. The INC has recommended that blocks with 100 or less working/reserved numbers (10% contamination level) be considered as available for pooling.

[18] It is also necessary to identify the numbering needs of new SPs that will be entering into the market.

5.3.2 Pooling Timeline Description

5.3.2.1 Selection of a Neutral Pool Administrator

Thousands-Block number pooling requires the establishment and administration of numbering pools. The NANC has determined that the new North American Numbering Plan Administrator (NANPA)[19] should undertake this responsibility as an extension of its CO Code administration responsibilities.

5.3.2.2 Development of Pooling Administration guidelines

Guidelines for the administration of telephone numbers in a pooling environment must be established for use by the Pooling Administrator and SPs seeking numbering resources from the pool. Enhancements to the Industry Numbering Committee (INC) Code Assignment Guidelines were identified within pooling subcommittees in Illinois and New York for this purpose, and are currently under review and modification within the INC LNPA Workshop. It is expected that these guidelines will be completed and offered for NANC approval in the Fall of 1998. In addition, INC will be revising related industry numbering guidelines (e.g., CO Code Guidelines, NPA Relief Guidelines, etc.) for modifications to reflect Thousands-Block pooling. These guidelines will be completed and offered to NANC for approval in December 1998.

5.3.2.3 Selection of a pooling method

As discussed in Part 1 of this Section, the primary method of implementing Thousands-Block number pooling is through the use of either Activate-As-Needed or Pre-Port. Both have unique provisioning characteristics, which affect the LNP architecture and individual SP support systems in different ways. The same is true for the two snapback alternatives. A careful analysis of the costs, timing and benefits of these methodologies should be undertaken by all SPs involved. It may be desirable for all SPs within the same pooling area to implement the same provisioning methodology.[20]

TN pooling requires all pooled telephone numbers assigned to customers be populated in the LNP databases to facilitate proper network routing. In 1997, the industry recommended that target implementation (section 7.2.4.4 of December 1997 INC report on number pooling) for national Thousands-Block pooling provides SPs with the flexibility to activate their allocated thousand blocks consistent with their needs. Pooled numbers

[19] Lockheed-Martin is the new NANPA, and was also selected as the Pooling Administrator in both states that have issued an RFP.

[20] The NANC LNPA-WG T&O Committee is still discussing whether the requirement to have national standards include Activate-As-Needed as the target architecture, and whether it can be supported within a given pooling area, given their unique NPAC requirements.

could be activated (i.e., records placed in the NPAC/SMS, LSMS's, and SCPs) with any of the following methods:

- Pre-Port: populate the entire pooled Thousands-Block in the LNP databases by the effective date designated by the SP.
- Port-on-demand: pooled telephone numbers will be populated in the LNP databases at the time a TN (s) is assigned to a customer.
- Activate-As-Needed: pooled telephone numbers, or ranges of pooled telephone numbers (i.e., using EDR), are populated in the LNP databases anytime between the allocation of the block to a service provider (pre-port) and assignment of a TN(s) to a customer (port-on-demand).

All three options have unique provisioning characteristics, which affect the LNP architecture and individual SP support systems in different ways.

By a decision at the August 1998 NANC meeting, the industry direction is pre-port with EDR.[21]

5.3.2.4 NPAC SMS System Requirements

The NANC LNPA-WG (formerly NANC T&O Working Group) is currently developing number pooling requirements for the NPAC/SMS and associated interfaces which:

- permit the activation of pooled number records in the SMS and associated downloads to LNP SCPs within a 15 minute interval; and development of a pooled number indicator;
- permit the representation of a range of numbers in the SMS and SCPs, rather than the exclusive use of individual records, i.e., EDR;

The NANC LNPA is expected to complete the NPAC/SMS and associated interface requirements to support the pre-port pooling methodology with EDR by December 1998.

5.3.2.5 Development of Pooling Administration Specification and Requirements

It will be necessary to develop specifications and requirements for the pooling administration function prior to the implementation of Thousands-Block Pooling.

5.3.2.6 Development of Pooling Administration Systems

The selected Pool Administrator is expected to provide a mechanized system, which may permit viewing, storing and allocating the pooled number resources. This system will be built according to industry specifications and requirements.

[21] "Pre-port with EDR. There is no need to continue development of requirements for port-on-demand (POD)." NANC, August 19-20, 1998.

5.3.2.7 Service Provider modifications to LSMS and SOA

SP must update their SOA, LSMS, and interfaces to deal with any new functions required, including EDR, to support pooling.

5.3.2.8 Enhancements to SP OSSs

The selection of the provisioning method will have significant influence on the need to modify existing SP support systems. SPs must update OSSs to support Thousands-Block pooling. This, for example, includes number administration at the Thousands-Block level rather than at the 10,000 block level. An overview of the potential impact on SP OSSs is provided in Part 6, below.

5.3.2.9 Develop switch requirements for pooling

To date, all requirements identified to support pooling have been captured in the T1S1.6 LNP Letter Ballot. T1S1.6 is scheduled to continue to review pooling requirements to determine if additional requirements are needed. T1S1 is scheduled to go to Letter Ballot with number pooling requirements in December 1998.[22]

5.3.2.10 Enhancements to SP switches

The selection of the provisioning methodology will have significant influence on the need to modify existing SP switches. Potential switch impacts are discussed in Part 6. Although certain enhancements may be deemed desirable, they are vendor-specific and may not be essential for the start-up of Thousands-Block number pooling, as long as the switch is LNP-capable.

5.3.2.11 Enhancements to SP SCPs

Similar to the previous two steps, the extent of the impact on SP SCPs may depend upon the provisioning methodology selected. Such potential impacts are discussed in Part 6.

5.3.2.12 Enhancements to TRA products

NRRIC is working to develop modifications to support Thousands-Block pooling. There is agreement in the industry that there should be some form of Thousands-Block pooling information located in the LERG . There is disagreement as to what modifications are needed. While the issue of Thousands-Block pooling has been discussed during a recent OBF meeting, there has been no comprehensive look at any billing system impacts associated with Thousands-Block pooling in addition to what is needed to support LNP. The NANC should request that each forum establish a completion date for any modifications necessary to support Thousands-Block number pooling. Additionally, the ATF recommends that the NRO-WG send a liaison to the OBF for the purpose of initiating work on any potential requirements needed to support Thousands-Block pooling.

[22] See Attachment 3-6, T1S1.6 letter to NRO-WG Co-Chair, Mike Whaley, dated September 8, 1998.

5.3.2.13 Develop and Deploy NPAC Enhancements

The industry has identified the need for a number of enhancements to the NPAC operating software and associated interface software, to better facilitate Thousands-Block pooling (e.g., EDR), as well as to accommodate snapback to the block holder. Such enhancements will be available in future NPAC releases. NPAC Release 1.4, which will be available in Illinois in October 1998, includes the functions required to allow for pooled ports of ranges of numbers by the NPAC administrator, handling of contaminated blocks and snapback to the block holder. A subsequent NPAC release will support the full functionality of EDR, and pooling block activation over the SOA. SPs deployment and testing of the associated software will be required.

5.3.2.14 Overall System Testing

Integrated testing of the various hardware and software components required to support number pooling needs to be undertaken prior to actual implementation.

5.3.2.15 Beta site/trial (if necessary)

Thousands-Block pooling is in virtual trial in Texas and in Beta trial in Illinois. As a result, it has been determined that no additional beta test sites will be required.

5.3.2.16 Establishment of the Pool

Prior to the start date of number pooling within a particular service area, a final count of the number of donated Thousands-Blocks, their associated rate area, and forecasts of future demand must be obtained from each participating SP. The attached Number Pooling Administration Guidelines detail this process.

5.3.2.17 Cost Recovery/Cost Allocation.

SP cost recovery requires regulatory action. Any order to proceed with pooling should resolve cost recovery issues. The NANC Cost Recovery Working Group has forwarded a recommendation to NANC for the allocation of the costs of the Thousands-Block PA. The recommendation is that the cost incurred by the PA, NANPA, for Thousands-Block pooling administration be covered by the existing NANPA formula. All remaining cost allocation/cost recovery issues need to be addressed by the appropriate regulatory authority.

5.3.3 Summary

Based on the information available and industry work to date, the projected implementation date for Thousands-Block pooling based upon a set of national standards and requirements is sometime between 4Q99 and 2Q00. However, a particularly critical date in this timeline is the date by which NPAC enhancements are developed and deployed, and the projection of 4Q99 availability is not firm at this time In addition, the timeline for several key tasks (i.e., SP modifications to LSMS and SOA, enhancements to SP OSSs, and development of NPAC enhancements) is linked to the date of a regulatory

order. For purposes of these timeline projections, it was assumed that there would be a regulatory order by December 1998. If pooling implementation is not ordered until a later date, then the implementation timeline would slip accordingly.

The projected implementation dates assume that several of the aforementioned steps may be completed concurrently and the tasks marked as TBD would also be done concurrently. The actual time required to complete the entire process is subject to a number of variables, including the extent of LNP deployment, the provisioning method chosen, compatibility of SP OSSs, selection of a Pooling Administrator, and the need for enhancements to SP switches, SCPs, etc. It should also be noted that this implementation timeframe is dependent upon the availability of the required hardware/software changes from vendors. Based on the above information, it is estimated that Thousands-Block number pooling could be implemented initially sometime within a 10 to 19 month interval after a regulatory order.

5.4 Cost Estimation

Similar to the implementation timeline described above, the cost of Thousands-Block number pooling is subject to a number of variables unique to each geographic area and service provider.

As such, it may be difficult to identify an overall cost that is applicable in all areas. The ATF issued a cost questionnaire to further capture and analyze implementation cost information from End Users, SPs and Industry Suppliers. The NRO-WG agrees with ATF members that given the low response rate for the Thousands-Block questionnaires, little if any conclusion can be drawn from the data. As such, it is offered for information purposes only within Attachments 3-7 to 3-12.

5.4.1 Service Provider

The following elements may contribute to the overall cost to provide Thousands-Block pooling. Not all SPs may incur all of the SP related costs below. In addition, some of the costs that are identified below may not be fully attributable to Thousands-Block pooling:

- NPAC SMS transaction charges - The NPAC SMS transaction charge is currently applied to each TN that is ported.
- NPAC SMS modifications - Modifications of the NPAC SMS to support Thousands-Block pooling, including Efficient Data Representation (EDR), snapback, etc.
- SP LNP Systems - Potential additional capacity to handle the increase in the number of records that is required for Thousands-Block pooling.
- SP OSSs - Modification of the OSSs to remove system dependency associating a CO code to a switch will be required. SOA and LSMS system changes may also be needed to accommodate Thousands-Block pooling changes to the NPAC SMS interface.

5.4.2 Public Safety System modifications

There may be some modifications to the public safety systems, e.g., to remove the association of CO code to switch.

5.4.3 End User

Thousands-Block pooling should introduce no direct costs to the end user. It should be acknowledged, however, that costs incurred by SPs may be eventually recovered through end users. Cost recovery will need to be addressed by appropriate regulatory entities.

5.5 Benefits of Measure

- Following are the qualitative and quantitative benefits from Thousands-Block pooling.

5.5.1 Qualitative Benefits

- The potential benefit of Thousands-Block pooling is an increased efficiency of NANP resource utilization. This could lead to less frequent NPA exhaust situations. Thousands-Block pooling can help conserve NPAs, since it may allow for a delay in NANP expansion due to frequent NPA exhaust. However, NANP expansion may be triggered by factors other than the exhaust of the supply of NPAs.
  - Any or all SPs participating in Thousands-Block pooling may have access to a broader base of numbering resources that are desirable to customers.
- Thousands-Block pooling has the potential to increase the efficient utilization of NXXs. However, the degree of increase will depend on specific factors in the pooling area, e.g., level of SP participation and characteristics of the pooling area.
- To the extent that embedded numbering resources are donated to a rate area pool, Thousands-Block pooling will increase SP access to those embedded resources.
- End users/consumers derive additional benefits from LNP technology as a result of its use for pooling.
- Pooling will potentially increase end user's ability to receive service from a SP with the number resource of the end user's choice.
- Thousands-Block number pooling may be provided in a timeframe consistent with the FCC target of 4Q99.

5.5.2 Quantitative Benefits

- Increased efficiency of NXX utilization can be measured by the Pooling Administrator several months to a year after Thousands-Block pooling is

implemented. This can be done by comparing pre- and post-Thousands-Block pooling SP utilization reports.

- Delay of future NPA relief efforts can be measured by comparing the pre-Thousands-Block pooling NANPA projected NPA exhaust date to the actual NPA exhaust date.
- Increased SP access to currently embedded numbering resources can be measured after the Pooling Administrator determines the final quantity and source of currently embedded TNs that participating SPs donate to each rate area pool.

5.6 Technical Considerations

Thousands-Block number pooling is contingent upon the existence of LNP, and uses its architecture, process flows and routing characteristics. Experience gained in pooling trials and through industry efforts have resulted in the following:

5.6.1 Regional NPAC

Pooling requires that all pooled TNs assigned to customers be populated in the LNP databases to facilitate network routing. To support the porting requirements in a number pooling environment, the following modifications to the NPAC and associated interfaces will be implemented:

- The NPAC and all associated interfaces must be modified to permit the representation of a range of numbers rather than the exclusive use of individual records, i.e., EDR.
- The existing design and capacity of LNP SCP databases was engineered specifically for SP LNP; permitting a customer to change SPs while retaining his or her telephone number. Number pooling requires the population of all pooled numbers into the LNP databases (e.g., NPAC, SMSs, and SCPs) to accomplish network routing. Therefore, pooling will create a significant, unpredictable, unforeseen demand for LNP SCP database record capacity. The national industry standards groups recognized the potential for this additional demand to exhaust an SP's LNP SCP database record capacity which would endanger the ability of customers to change SPs while retaining their telephone number. The development of EDR will enable SPs to minimize the impact of number pooling on the LNP SCP database record capacities.
- The NPAC and associated interfaces must be modified to permit activation of pooled telephone numbers by an SP allocated a pooled Thousands-Block (termed the "Block Holder") within a 15 minute interval.
- The current functionality of the NPAC and associated interfaces is designed specifically for SP portability. The system permissions and automated processes are designed around the premise that one SP (termed the "Code Holder") is responsible for the administration of an entire NPA-NXX. The current LNP

platform does not recognize the authority of a "Block Holder", as the administrator of telephone numbers in a pooled thousand block, to create LNP records during the assignment of pooled telephone numbers to a customer. The pooling modifications to the NPAC and associated interfaces will provide the "Block Holder" with the ability to create LNP records during the activation of a pooled telephone number to a customer within 15 minutes.

In 1997, INC recommended a target implementation (section 7.2.4.4 of December report) for Thousands-Block pooling which would provide SPs the flexibility to activate their allocated thousand blocks consistent with their needs. Pooled numbers could be activated (i.e., records placed in the NPAC/SMS, LSMS's, and SCPs) with any of the following methods:

- Pre-Port; : populate the entire pooled thousand block in the LNP databases by the effective date designated by the SP.
- Port-on-demand: pooled telephone numbers will be populated in the LNP databases at the time a TN (s) is assigned to a customer.
- Activate–as-needed: pooled telephone numbers, or ranges of pooled telephone numbers (i.e., using EDR), are populated in the LNP databases anytime between the allocation of the block to a service provider (pre-port) and assignment of a TN(s) to a customer (port-on-demand).

The NANC LNPA is expected to complete the NPAC/SMS and associated interface requirements to support the pre-port pooling methodology with EDR by December 1998. (For details on the current timeline , requirements, statement of work, development, testing, and deployment, see NANC LNPA documentation.)

5.6.2 End Office Switches

The consensus of the Work Group is that the impacts of number pooling at the Thousands-Block level on end office translations and processing requirements are minimal. Certain wireline switches (e.g., 1AESS) and certain wireless switches have NXX capacity limits and may be affected by implementation of number pooling. Thousands-Block number pooling does not appear to impose significant yhmemory or processing capacity demands on switches beyond that which is already required to support LNP.

Thousands-Block pooling within a rate area can lead to a large number of varied and dispersed NXXs served by a SP's given switch. This may lead to capacity implications on specific switches that will limit their ability to participate in pooling and obtain adequate numbering resources. Inclusion or exemption of these switches in a Thousands-Block pooling environment needs to be addressed. The technical limitations of these certain switches need to be researched further in order to determine their limitations in a pooling environment.

Treatment of unassigned numbers may vary, depending upon whether numbers in blocks allocated to SPs other than the NXX assignee are immediately placed in the NPAC and downloaded to SP SCPs (i.e., pre-ported), or ported as they are actually assigned or reserved for a particular customer (i.e., port-on-demand). Under pre-porting, calls to numbers are routed to the block holder's switch as soon as the associated Thousands-Block is allocated. The application of appropriate unassigned number treatment may be compromised by the existence of an LNP error notification feature (i.e., Cause Code 26) which assumes that LNP-routed calls should always terminate to a working TN. This feature may prevent calls to numbers allocated yet unassigned within a block holder's switch from receiving a proper "unassigned number" announcement. Instead, such calls may result in a failure release (Cause Code 26) message being returned to the originating or intermediate network, and the call being forwarded to an error announcement. This issue has been referred to ATIS Committee T1S1.6 with final resolution and acceptance expected in December 1998.

5.6.3 SCPs

Some SPs have expressed serious concerns with number pooling in general, because the record storage capacity of many carriers' networks may quickly be exceeded if each pooled number is represented by an individual entry in the data base(s). Many SP LNP SCP database record capacities were engineered specifically for service provider LNP; permitting a customer to change SPs while retaining his/her telephone number. Number pooling requires the population of all pooled numbers into every SP's LNP SCP databases to facilitate proper network routing. Therefore, pooling will create a significant unforeseen demand for LNP SCP database record capacity. The national industry standards groups recognized the potential for this additional demand to exhaust an SP's LNP SCP database record capacity. The exhaust of an SP's SCP database record capacity would endanger the ability of customers to change SPs while retaining their telephone number.

Arrangements were proposed to minimize concerns associated with LNP SCP database capacity (i.e., the need to accommodate the added number of records that would be stored in LNP SCPs as a result of number pooling). These arrangements suggest that a range or block of numbers allocated to a given SP need not be represented in LNP SCP databases as individual records, but could instead be identified as a single record (i.e., EDR).

The NANC LNPA-WG is currently developing requirements to support the implementation of EDR. The NANC LNPA-WG is expected to complete the EDR NPAC requirements in December 1998. NPAC and associated interface EDR development and implementation could be completed by the end of 4Q99.

The impact on current LNP SCP databases will vary among all SPs depending on the database vendor and network architecture selected. Each SP will work with its LNP SCP database vendor to determine the most cost-effective method for accommodating the

incremental number pooling demand for LNP SCP database record capacity. The SP and LNP SCP database vendor alternatives include, but are not limited to:

- Developing the EDR function into the LNP SCP database design;
- Expanding existing LNP SCP database record capacity;
- Developing the EDR functions and expanding existing LNP SCP database record capacity;
- Absorbing the additional record demand with the existing LNP SCP database capabilities.

LNP SCP vendors who utilize EDR can initiate their development cycle in December 1998. This is the expected NANC LNPA-WG completion date of EDR requirements for the NPAC and associated interfaces. All LNP SCP database vendors may need to implement software enhancements to accommodate the NPAC and associated interface modifications that permit activation of pooled TNs by a provider allocated a pooled thousands- block (termed the "Block Holder") within a 15 minute interval.

The ultimate objective is to identify an alternative that best addresses an individual SP's concern relative to LNP record capacity. Much will depend upon how quickly numbers become ported for pooling purposes. Although this may be more of a concern if the pre-port method is employed, some have suggested that any steep increase in record requirements will soon subside once SPs receive their initial block allocations[23].

Concern has been expressed in relation to SS7 looping in a pooling environment. An example of this situation is where one SP uses six digit Global Title Translations (GTT) based on the LERG/LARG/TPM, and for all level of translations beyond 6 digits the LNP GTT information is used. Another SP uses thousand block (7 digit) information in the LERG/LARG/TPM for Global Title Translation. Prior to information being downloaded from the NPAC SMS, looping could exist between the two SPs where the first SP is attempting to send the TCAP messages to the Code Holder and the second carrier would try to send them to the Block holder. In the case where the first carrier is the Block holder and the second SP is the Code holder a looping would occur. Both the Illinois SCP committee and the T1S1.6 have concluded that looping is not a problem if all SPs utilize the NPAC SMS download as the source for all DPCs beyond 6 digits.

5.6.4 Operational Impacts

Individual SPs participating in number pooling need to identify and assess the actual impact of Thousands-Block number pooling on their provisioning and support systems. Systems that rely on the association of an NPA/NXX with one particular SP and one

[23] Subsequent increases will occur only in situations whereby a particular SP's actual demand has exceeded its initial allotment.

particular end office may require enhancements to support NXX-X (Thousands-Block) level administration.

Numerous SPs have indicated that their current OSSs rely on the association of an NPA-NXX with one specific SP end office. These SPs require significant OSS enhancements to support the administration, provisioning, billing, and maintenance of Thousands-Blocks in a number pooling environment. These significant modifications are required to:

- support the administration, provisioning, billing, and maintenance of NPA-NXXs across multiple switches (e.g., NPA-NXX-1 on switch A and NPA-NXX-2 on switch B);
- uniquely identify "pooled" numbers for disconnect treatment (i.e., snapback), tracking, and accounting;
- remove 1,000 number blocks from SP TN inventories that have been donated to a rate area pool so that inadvertent assignment of TNs within thousand blocks allocated to other SPs does not occur;
- import partial NXXs (i.e. Thousands-Blocks) allocated to SPs from the rate area pool;
- avoid accepting orders or trouble reports from other SP customers by identifying block ownership of pooled Thousand-Blocks.

These enhancements to support Thousands-Block number pooling are above and beyond those required for SP LNP.

The level of OSS modifications for number pooling will be SP-specific based on their analysis of the Thousands-Block number pooling OSS impacts. SP systems potentially affected include, but are not limited to:

- number resource management
- number assignment
- service order negotiation
- provisioning
- switch attributes/features management
- translations activity management
- billing
- maintenance
- LNP Local Service Management Systems
- LNP Service Order Administration Systems

Additional systems of some SPs may require modifications if allocations of Thousands-Blocks within the same NXX to different end offices owned by the same SP and serving the same rate area are required.

Changes to the Bellcore Local Exchange Routing Guide (LERG), and Terminating Point Master (TPM), are considered by many SPs to be essential or highly desirable. The National Rating and Routing Industry Committee (NRRIC) plans to complete requirements to support Thousands-Block pooling in the LERG by December 31, 1998. As such, these enhancements could be available in March 1999. In addition, the OBF Committee will be evaluating potential modifications to the TPM file.

5.6.5 Network Reliability

It is acknowledged that number portability, due to its reliance on external database look-ups for call completion, increases the complexity of call routing. It also increases the difficulty in identifying the cause of call failures. Since Thousands-Block pooling increases the volume of ported TNs, these concerns are exacerbated and could adversely impact network reliability. For example, in the event of an SCP failure more calls will fail to complete because fewer calls will be able to rely upon default routing for completion.

5.7 Impact on Competition

The following addresses the potential impact of Thousands-Block number pooling on competing SPs, with focus on two particular areas.

5.7.1 Equal Availability of Numbers

Thousands-Block number pooling helps to ensure that all SPs within the pooling area have access to the telephone numbers they need to serve their customers. It accomplishes this by allocating numbering resources in smaller increments (i.e., blocks of one thousand numbers) compared to that used previously. In this manner, numbers within pooled NXXs can be shared among multiple SPs (as opposed to allocating each full 10,000 number NXX to a single carrier), thus increasing the efficiency of the resource and reducing the potential for NPA exhaust. Implementation of number pooling by LNP capable SPs should make more NXXs available for all SPs. A historical problem with NPA exhaust situations has been that until relief is obtained, SPs may be prevented or restricted from obtaining the numbers they need to serve their customers. Thousands-Block number pooling helps eliminate this problem.

5.7.2 Implementation Impacts

5.7.2.1 Out of Area

Non LNP-capable SPs, who deliver traffic directly to end offices, which use pooled numbers, will encounter increased charges for undipped traffic. This is because the use of LNP to pool numbers means that more numbers will be "ported numbers" than if an LNP-based Thousands-Block pooling arrangement were not in effect.

5.7.2.2 All SPs

The FCC adopted a deployment schedule driven primarily by competition in that it was not necessary for a switch within the top 100 MSAs to be made LNP capable until a competitor had made a request for this to be done. Number pooling, if ordered by a State Commission across an entire area code, may artificially accelerate the deployment of LNP in switches throughout the area code or MSA.

5.7.2.3 Disproportionate Treatment

Because number pooling is reliant upon the implementation of LNP, and given that the LNP roll-out schedule is not the same for all SPs, there is the likelihood that SPs using different technologies (i.e., cellular, paging, wireline, etc.) will be treated differently in terms of number administration. SPs participating in number pooling will receive blocks of one thousand numbers within an NXX code shared by multiple providers within a rate area. SPs not participating will receive full NXX codes to replenish their inventory, which is perceived by some SPs to be a competitive advantage.

5.7.3 Additional issues have been identified and are detailed below

To establish each rate area pool, Draft 10 of the INC Thousand Block Number Pooling Guidelines requires each participating SP to contribute embedded thousand blocks that are up to and including 10% contaminated. Newly activated NXXs tend to have lower quantities of unavailable numbers than do long established NXXs. Consequently, SPs with more recently acquired NXXs may donate a large proportion of their embedded thousand blocks and conversely, SPs with long established NXXs may donate a low proportion of their embedded thousand blocks. Due to the size of their embedded inventories incumbent SPs may donate a larger amount of thousand blocks to the pool than new entrants. All SPs will be permitted, under Draft 10 of the INC Thousand Block Pooling Guidelines, to retain an inventory sufficient to meet nine months of forecasted customer demand.

Some SPs consider themselves at a competitive disadvantage as a result of their inability to meet customer requests for specific numbers that reside in another SPs embedded inventory. These SPs believe that other SPs who may retain a significant number of contaminated blocks from established NPA-NXXs are more likely to be able to meet customer requests for specific numbers. This is perceived by these SPs to be a competitive advantage for the incumbent SP. Other SPs note that available numbers remaining in contaminated blocks are less preferred by customers and pooling of blocks with up to 10% contamination will go a long way toward mitigating this perceived imbalance.

5.8 Consumer Issues

As suggested above, consumers should benefit by the deployment of Thousands-Block number pooling by avoiding or delaying the need to accept number changes, dial

additional digits, or endure other inconveniences brought about by other forms of NPA relief. Pooling may, however, restrict the consumer's ability to obtain a desired number from a specific SP, obtain additional (sequential) numbers to add to an existing PBX or Centrex block, or reserve numbers for an extended period of time. SPs' ability to accurately forecast consumer demand for numbers will become more important than ever, given the fact that individual SP inventories will shrink and any need for additional numbers cannot be met immediately.

5.8.1 Dialing Changes

Number pooling requires no change to the number of digits dialed by calling parties.

5.9 Public Safety Issues

The 911 Subcommittee of the Illinois Number Portability Workshop has assessed the impact of number pooling at the Thousands-Block level in Illinois. They identified no substantial impacts beyond those already planned to implement LNP as defined in the National Emergency Number Association (NENA). They instead focused on the desire to identify the Thousands-Block assignee within the MS and Selective Router/Address Location Identifier (SR/ALI) data bases, to ensure prompt resolution of trouble reports suspected to be caused by incomplete or inaccurate routing information. Subcommittee members felt that this capability was not an absolute necessity for deploying Thousands-Block number pooling and could be added at a later time.

There are three methods of assigning numbers for non-dialable use in the wireless E-911 implementation and interconnection. Two of the three methods utilize NANP numbers. The first would utilize NANP numbers assigned to the wireless SPs; the second uses LEC NANP numbers. The third method utilizes fictitious, non-dialable numbers. All three methods permit public safety agencies to locate a wireless subscriber calling 911 by cell site location. There must be enough numbers allocated to this purpose to accommodate the anticipated 911 traffic and to fulfill the technical characteristics of the given 911 architecture. It is important to note that wireless SPs are in the process of fulfilling a two-phased implementation of enhanced 911 location technology. Allocation of these numbers must be made to ensure compliance with this mandate. Thus, these numbers should be considered "nonassignable" for all purposes, including pooling.

Also, the number pooling implementation method must be considered prior to permitting use of ported or pooled numbers for this purpose. Default routing, vacant number treatment and other considerations may preclude use of pooled or ported numbers for this purpose. Due to the scarcity of NANP resources, it may be preferential to utilize fictitious number for this purpose on a uniform, nationwide basis.

5.10 Other Considerations

5.10.1 Jurisdiction

The FCC has plenary jurisdiction over number administration. The FCC has delegated to the states the authority to resolve matters involving implementing new area codes. (Paragraph 265, FCC Second Report and Order and Memorandum Opinion and Order concerning various numbering issues, FCC 96-333.)

Number pooling has attributes of both numbering administration and area code relief. Thus, the level of authority states have regarding number pooling is subject to dispute among industry segments and regulatory bodies. Pooling has been defined as area code relief in several states and as such would give states the ability to mandate number pooling. On the other hand, others consider number pooling to be a numbering administration issue.

The FCC sets the schedule for LRN-LNP MSA implementation as it relates to SPs. Therefore, SPs would not be bound by state-initiated LNP based number optimization mandates, such as Thousands-Block pooling where SPs have not implemented LNP. However, SPs should be expected to participate in number pooling when and where the FCC mandates implementation of LNP.

5.10.2 Conditions Which Support Maximum Potential

As is the case with other number optimization alternatives, Thousands-Block number pooling has the potential to achieve its maximum efficiency under certain conditions. Such conditions may include the following:

- Significant deployment of LNP within the pooling area.
- Given its reliance on the LNP architecture and process flows, Thousands-Block number pooling works best in situations where all or most participating SPs and switches are LNP-capable. The consequences of limited LNP deployment are explained above (Disproportionate Treatment).
- When applied to an NPA prior to a pending exhaust condition.
- Thousands-Block number pooling is best applied early in the life of a working NPA, prior to the emergence of a jeopardy situation. This is due to the continuing need to assign new NXXs to certain SPs under certain conditions[24,] as well as to stock or replenish the pool within specific rate areas
- Multiple SPs providing service within the same rate area

[24] For example, to non LNP-capable carriers, as well as LNP-capable carriers with new switches.

- Number pooling provides little benefit in situations where there is little or no competition within a given rate area. The sharing of NXXs assumes that there are several SPs present who share numbers.
- An ample supply of uncontaminated and lightly contaminated blocks.
- Effectiveness of thousand block pooling may be enhanced if a large supply of uncontaminated and lightly contaminated blocks is available. This includes blocks within both assigned and unassigned NXXs.
- Maximum SP participation in pooling
- The benefits of Thousands-Block pooling may be enhanced if all or most SPs in the area of pooling participate. To the extent that some SPs in the pooling area still require the assignment of full NXX codes, the overall optimization resulting from Thousands-Block pooling may be diminished.

Please see Attachments 3-1 through 3-12 for additional Thousands-Block pooling reference documents.

The perspectives of certain state regulatory entities on the feasibility and utility of Thousands-Block pooling is shown in Attachments 3-3, 3-4, 3-4a, and 3-5. They are included for information purposes only, and have been reprinted in whole, without review or revision by the ATF. Their inclusion does not imply consensus, or lack thereof, by the ATF or NRO-WG.

5.11 Attachments

Documents from other industry groups have been provided as reference documents for information purposes. The ATF has not reviewed these documents and does not endorse their contents; inclusion of these documents does not imply consensus, or lack thereof, by the ATF or NRO-WG.

MINORITY OPINON OF MCI WORLDCOM AND AD HOC ON 1000 BLOCK POOLING

MCI WorldCom and the Ad Hoc Telecommunications Users Committee (“Ad Hoc”) support wholeheartedly the FCC’s goal of implementing telephone number pooling as a means to optimize the North American Numbering Plan (NANP) and enhance competitively neutral administration. Unfortunately, the recommendations developed under the Numbering Resource Optimization Working Group (“NRO”) for 1000 block pooling fall far short of its potential to maximize efficient and competitively neutral allocation of telephone numbers, to support increased consumer choice of numbers, and to reduce the accelerating pressures on state public service commissions for area code splits and other forms of Numbering Plan Area (NPA) relief. As framed by the NRO, 1000

block number pooling is “too little, too late” to have any appreciable impact on number resource exhaust and will have a discriminatory, and thus anticompetitive, effect on competitive LECs (CLECs). For these reasons, as detailed below, MCI WorldCom and Ad Hoc are constrained to dissent from the 1000 block pooling section of the NRO’s report to NANC.

If implemented in an optimal fashion, 1000 block pooling could result in a marked improvement in number utilization efficiency and in competitive access to the entire number resource. Instead, the recommendations for 1000 block pooling developed for the NRO report in several critical respects would create a competitively biased numbering system and would undermine the effectiveness of 1000 block pooling as a means of improving number utilization:

1. “Contamination” Levels

The contamination levels accepted by NRO mean that the carriers holding most of the 1000 block assignments, namely incumbent LECs (ILECs), will not be required to contribute any significant proportion of their numbers to the industry pool. By setting block contamination at 10%, the NRO recommendation will significantly limit the total contribution to the pool, thus reducing the overall impact of pooling on NPA exhaust. The 10% contamination criterion will unnecessarily work to excuse ILECs from having to contribute to the pool numbers from their embedded base of available numbers. This will result in a disproportionate contribution of CLEC inventories to the block pool, and virtually eliminate the potential offered by pooling to provide improved competitive access to the embedded base of unassigned numbers in any NPA or rate area.

Even in the absence of any 1000-block pooling requirement, if competition develops in the local exchange market it is entirely reasonable to expect that virtually all 1000 blocks in existing ILEC NXXs will become contaminated simply as a result of competitive churn. MCI WorldCom and Ad Hoc are concerned that the specific rationale being advanced by the NRO for resisting the requirement for ILECs to donate blocks with greater than 10% contamination to a number pool -- alleged limitations of SCP and data base capacity and the need to utilize Efficient Data Representation (“EDR”) for “strings” of numbers rather than to record numbers individually in number portability data bases -- implies a more fundamental question about whether the ILECs are fully complying with the Commission’s LNP requirements. If ILECs would encounter difficulties in accommodating highly contaminated blocks, they will necessarily encounter precisely the same kinds of difficulties in dealing with any reasonable level of number porting by customers switching to competing local carriers. It is entirely inappropriate for the NRO-WG report to accept operational and capacity limitations that would work to undermine LNP compliance even in the absence of any number pooling requirement as a basis for excusing ILECs from contributing numbers to a pool.

2. Inventory Size

The service provider and industry inventories recommended by the NRO report are so large — indeed, greater than presently in use in the industry — that they contradict the objective of reducing the current inefficiency of assigning full NXX (10,000 number) blocks to specific carriers. The recommendation for 18 months of inventory (9 month carrier inventories plus an additional 9 month pool inventory), applicable to each switch in each rate area, will reduce potential number optimization benefits by prematurely draining the NPA resource and increasing the potential for permanently stranded resources in carrier inventories. In addition, these large inventories will reduce competitive access to available numbers by protecting more numbers than necessary for individual carriers, rather than leaving them available to all carriers via the industry pool. Ironically, an effective number pooling system should reduce, not expand, the need for individual carriers to maintain large inventories of unassigned numbers.

3. Block Assignment

By assigning 1000 blocks to each carrier's switch, the NRO recommendations could unnecessarily deplete 1000 block resources. The assumption that 1000 blocks will be assigned to carriers on a per-switch basis, rather than on a per rate area basis, ignores the ability of carriers to share blocks among multiple switches within a rate area using LNP, or to develop that ability if not already available. Failure to consider this option competitively advantages carriers, such as ILECs, with multiple switches per rate area, and may significantly increase the number of blocks required by a carrier for a rate area.

4. Exemptions for Some ILEC Switching Systems

The suggestion that certain switch types may warrant exemption from pooling is premature, and could dramatically reduce ILEC participation in pooling.. The proponents of the exemption language were unable to explain the nature any technical limitations, much less link them specifically to pooling, as opposed to LNP. If there are valid technical constraints on pooling for some switches, the question of whether or not such constraints justify a more extended schedule for pooling implementation, let alone the broader relief of an exemption or waiver, is a policy question appropriately decided by the FCC.

As long as a particular switch is required to be LNP capable, it must be presumed to be pooling capable as well. Whatever limitations are claimed to exist that would prevent pooling to be implemented in a particular switch or switch type would also preclude more than taken compliance with the FCC's LNP requirements. ILECs claiming that a putatively LNP-capable switch is not also pooling capable may in fact not be in compliance with the LNP requirements with respect to that switch, and such non-compliance must not be permitted to serve as a basis for exemption from participation in 1000-block pooling.

CONCLUSION

The NRO recommendation will disproportionately affect CLECs, impose little if any pooling responsibility on ILECs, and do little to address the overarching problem of number exhaust and its detrimental impact on consumers, businesses, government, and the economy generally. The NRO report fails to deal with ramifications of this disparate impact of 1000 block pooling, under the proposed implementation, on CLECs. The anticompetitive effect occurs because, when pooling only blocks with a low level of contamination, CLECs would return a far greater amount of their inventory to the pool, would gain little access to the ILEC embedded base of available numbers, and would as a result be less able to attract and retain customers with specific numbering needs. Moreover, due to the severe limitation on the quantity of numbers that would be available for pooling as contemplated under the NRO recommendation, the overall number conservation benefit arising from pooling would be so diminished as to be virtually ineffective and hardly worth the effort.

The addition of unassigned number porting (UNP) to 1000 block pooling is necessary to mitigate the anticompetitive and minimal conservation impacts of 1000 block pooling, by allowing access by all carriers, and all customers, to unassigned numbers in any block. If contamination levels were increased substantially and inventory size correspondingly reduced, 1000 block pooling could also serve as a valuable, interim measure to relieve NPA exhaust pressures. (Of course, even an optimal 1000 block implementation will yield benefits an order of magnitude less than individual telephone number pooling.) In contrast, as recommended by the NRO, 1000 block pooling will create competitive numbering disparities and do very little to alleviate the increasing rate of NPA splits and overlays.

6 Unassigned Number Porting

6.1 Description

6.1.1 Definitions

Unassigned Number Porting (UNP) is a telephone number (TN) sharing and/or optimization method where available TNs in one service provider's (SP) inventory are ported (using the Location Routing Number (LRN) method) to another SP. This is 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 under the direction of a neutral third-party coordinator. The UNP neutral third party acts as a cordinator rather than an administrator, whereas there are additional administrative responsibilities involved under pooling.

UNP will be utilized to provide numbers to a service provider who has insufficient numbers available for assignment for a specific customer request for service within a given rate area basis.

For the purpose of this report, the term "insufficient numbers" refers to a condition (1) when a service provider has no inventory in a rate area to meet a specific customer request, (2) where existing SP inventory for that same rate area has been exhausted, or (3) where existing inventory can not meet a specific customer request due to technical constraints.

SPs' requests to accommodate a specific customer need are considered to be an exception and may or may not be met subject to yet to be developed guidelines.

This Report focuses on the UNP implementation where available numbering resources have been depleted to the extent that individual SPs are unable to otherwise obtain TNs (interim deployment). The impacts of UNP implementation in other situations where resources are available for allocation to SPs has not been addressed. Other situations (e.g. use of UNP in non-jeopardy situations) are not addressed in this document due to time constraints which prevented the resolution of substantive differences among the participants (long term deployment). The resolution of these differences may be challenging and time consuming. It should be noted that no qualitative or quantitative analysis of either the costs or the benefits of UNP was performed to support the conclusions in this report. The conclusions are based upon information available at the time that the report was prepared and the informed judgement of the subject matter experts involved. As additional information becomes available, the conclusions may be modified.

6.1.2 Architecture

Figure 6.1, below, was developed to identify a potential 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.

This potential process flow does not address internal SP processes needed to accommodate UNP. It should be noted that, in order to accomplish this process in a timely manner, significant OSS and internal process changes may be required by some SPs.

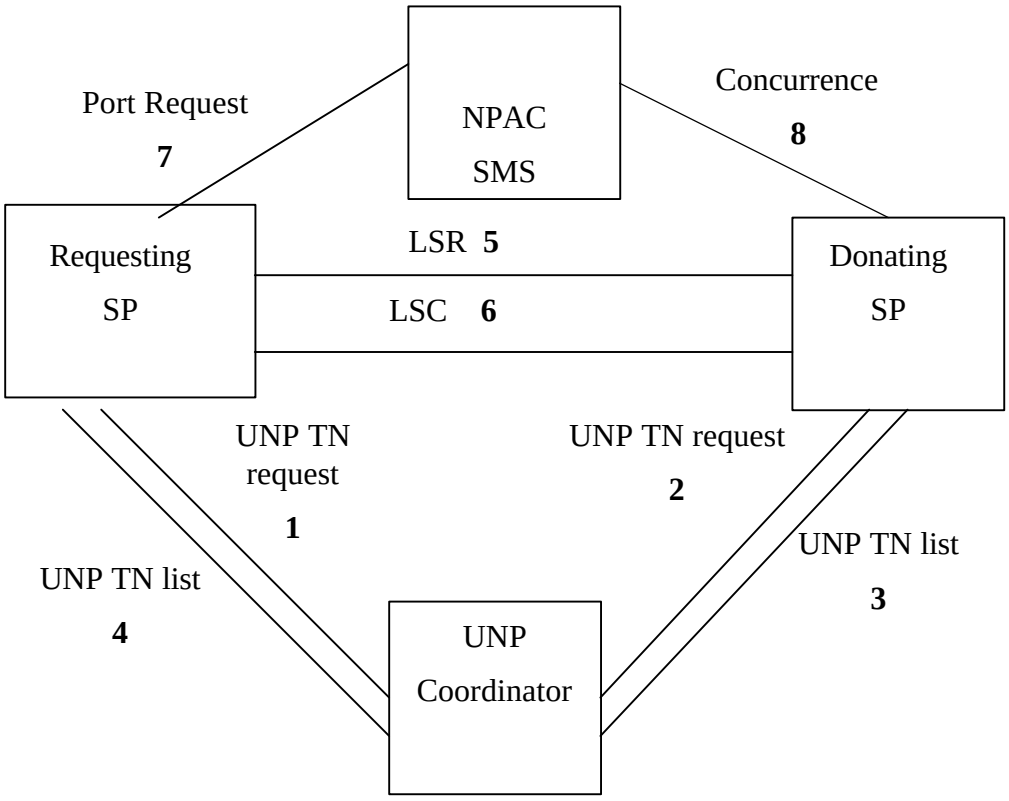

Figure 6.1 – Unassigned Number Porting General Process Flow

SPs provide the UNP Coordinator with the quantity of TNs available in each rate area on a periodic basis. The actual porting of unassigned numbers proceeds as follows:

1. When an SP requests unassigned numbers to port for a specific customer (1), the Coordinator and the SP will jointly validate the requests when appropriate, as designated by the yet to be developed guidelines. When the request is validated the Coordinator will use the information in the TN availability reports to select a candidate donor.

2. The Coordinator relays the request to the candidate donor. The candidate donor determines if there are sufficient TN's to meet the request. Donor excludes from availability, to the extent possible, these numbers in its systems (e.g.: TN administration, billing and switching systems) (2). The interval required for this step must be addressed in the guidelines.
3. When the candidate donor confirms that TNs are available to meet the request, it provides to the Coordinator a response containing the specific TNs to be used to meet the request. (3)
4. The Coordinator relays the response to the requesting SP. (4)
5. The requesting SP then sends a Local Service Request (LSR) to the donor requesting the numbers be ported. (5)
6. The Donor returns a Local Service Confirmation (LSC).(6)
7. On receipt of the LSC, the requesting SP sends a port request to the NPAC SMS.(7)
8. The donor sends port request with concurrence to the NPAC SMS.(8).

Following these steps, consistent with standard LNP processing, the requesting SP sends a port activation to the NPAC SMS. The NPAC SMS then broadcasts the LNP routing information for the ported TNs to the industry.

6.2 Principles & Assumptions

6.2.1 UNP Participation Principle

SPs who have implemented permanent LNP 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 also participate in UNP where UNP is being utilized.

All SPs participating in UNP must, at a minimum, be prepared to contribute TNs using the UNP process, in accordance with guidelines. Such SPs may still obtain usable geographic numbering resources in accordance with applicable guidelines.

6.2.2 UNP Non-participation Principle

An SP switch should not be required to participate in UNP before they are required to offer long-term local number portability in a rate area. Such SPs may still obtain usable geographic numbering resources in accordance with applicable guidelines[25].

[25] This report does not address allocation of NXXs in a crisis condition.

6.2.3 UNP Network Reliability Principle

When implementing a UNP process, even though minimal porting volume is expected, serious consideration must be given to network reliability and performance so that no adverse impacts are realized.

6.2.4 UNP LNP Impact Principle

The implementation of any UNP mechanism or methodology will not impact the functionality of, or schedule for, LNP as ordered by the FCC.

6.2.5 UNP Uniformity Principle

The provisioning methodologies, administrative procedures and interfaces used to support UNP shall be uniform nationwide.

6.2.6 Additional Assumptions

- UNP will not be implemented until a neutral Coordinator is in place and able to perform the coordination function.
- Requesting SPs will activate a TN obtained through the UNP process for the specific customer for whom the TN was originally requested within a guidelines-specified interval following the completion of the port from the donating SP.
- UNP TNs are not to be used for the establishment of customer TN reservations.
- UNP TNs are not to be used for the establishment or augmentation of SP inventories.
- Use of UNP will be within the defined rate area of the NXX involved.
- UNP will follow existing NANC LNP provisioning process flows.
- The UNP Coordinator will be a neutral third party.
- UNP will not be industry-segment specific. Although there may be additional considerations unique to particular segments of the industry, UNP must be available to all LNP capable carriers.
- The current wireline call rating paradigm, in which call rating for wireline carriers is based upon the rate areas associated with the calling and called party, will not be impaired by UNP.
- Implementation of UNP will be subject to applicable local, state and federal regulatory requirements.
- Snap-back in a UNP environment is the same as in standard LNP.
- The UNP described in this proposal is not to be used in lieu of NPA relief.

6.3 Implementation Time Frame

The following section outlines the various high level tasks necessary to make UNP a reality from the time a regulatory body with appropriate jurisdiction issues its decision to require implementation of UNP. Some components of the following timeline require formal regulatory guidance, including resolution of cost recovery issues.

In each task listed there is a broad range estimate of the months required to complete each task. For most activities, a recommendation regarding the appropriate industry group or organization that could be delegated responsibility to achieve the listed task is indicated.

The estimated time line does not address the regulatory environment, e.g., the process and time period required for an FCC order to deploy UNP, and/or the local public utility commission activity for any required approvals and mandates. The time line assumes that there is an industry agreement in place for an appropriate industry group to perform the project management for UNP implementation.

What follows are the high level steps that are required to implement UNP. This may involve a multi-step process that begins with the FCC directing the industry to pursue advancement of UNP. It is anticipated that the decision to implement UNP in a specific NPA may require a separate directive. It is assumed that all of the tasks are undertaken after the FCC direction is received. The tasks that end in an asterisk (*) may be undertaken and accomplished prior to the directive to proceed within a specific NPA. If the assumption regarding the regulatory process is found not to be accurate, then the determination of which tasks could be performed prior to a mandate would need to be revisited.

Proposed Project Management/Technical Tasks and Estimated Time Line[26]

	TASK	TIME PERIOD	RESPONSIBLE GROUP
1.	Recommendation of supplements to LNP architecture for UNP*@	@1-3 months	NANC
2.	Determine high-level requirements *@	@2 months	NRO-WG/OBF
3.	UNP Coordinator guidelines *@	@3-6 months	INC
5.	NPAC SMS system requirements *[27]	0-3 months	NANC LNPA
6.	Public safety requirements*[28]	0-3 months	Public safety agencies
7.	Determine if administration Is by NANPA or other third	2-4 months	NANC

[26] Additional tasks may be identified for wireline and wireless networks

[27] There may or may not be a need for a UNP indicator.

[28] There may or may not be a need for a history file in E-911 systems

	party. *		
	Determine who will issue the RFP*	1 month	NANC
8.	Prepare and develop Requirements/RFP for UNP Coordinator *@	@3-4 months	TBD
9.	Ensure regulatory compliance of requirements/RFP *@	@0-1 months	TBD
10.	Issue UNP Coordinator requirements/RFP	1 month	TBD
11.	Vendor proposals preparation @	@1 months	Vendors
12.	Evaluate and select vendor @ (including negotiations)	@1 months	NANC/NRO-WG
13.	Determine billing and collection agent*	Concurrent	Cost Recovery
19.	Develop network and signaling requirements*	0-6 months	T1S1.6
21.	Develop FRS and IIS for NPAC SMS[27]*	0-3 months	NANC LNPA
22.	Build/modify/deploy systems @	@6-12 months	Vendor/SP's, SP OSSs, NPAC SMS, Test interoperability of Service Provider administrative systems – NPAC SMS
23.	Network enhancement/deployment and testing[27]	0-15 months	
24.	Develop Implementation Plan	3 months	
25.	Industry training	2 months	
26.	Trial the entire process and system	1 months	
27.	Initial Reporting to UNP Coordinator	@1 months	

The above timeline specifically addresses the initial implementation of UNP in a state or region. Subsequent implementations of UNP in a State or region may take less time because SPs that have already implemented systems modifications may not need to implement them again. However, the new area may contain SPs that have not yet implemented UNP system modifications. As such, the implementation timeline for UNP in a give area is subject to the capabilities of participating SPs.

Because there is no electronic interface between the service providers and the SP, it should be possible to begin development prior to selection of the UNP coordinator. Under this scenario, the timeline for implementation is moderated primarily by the developments that allow service providers to determine if a number is available and mark the number as unavailable outside of the current service provider process and to be able to

port such a number even if it is not a working number and is not associated with a working number.

The timeline indicates that work that could be done prior to an order for a specific NPA may take 9-16 months. For the initial implementation in a state or region, it is estimated that it may take an additional 8-14 months.

6.4 Cost Estimation

The magnitude of costs will be impacted depending on the robustness of the implementation (i.e., full or partial mechanization). As stated in section 6.1, this portion of the report focuses on the cost to implement where available numbering resources have been depleted to the extent that individual SPs are unable to otherwise obtain TNs (interim deployment).

6.4.1 Service Provider

The ITN Task Force has developed the following elements that may contribute to the overall cost to provide UNP. Not all carriers will incur all of the SP related costs below. In addition, some of the costs that are identified below may not be fully attributable to UNP:

6.4.1.1 NPAC Transaction Charges

The NPAC transaction charge, in the current cost recovery model, is applied for each TN that is ported. UNP will increase the transactions and thus may increase NPAC charges to the industry. It has not yet been determined how such additional costs will be allocated or recovered.

6.4.1.2 UNP Coordination

There is a requirement for a neutral third-party UNP Coordinator that will facilitate the UNP process. The UNP Coordinator would:

- collect and analyze available number reports from the SPs
- Identify which SPs may be eligible to donate numbering resources.
- Select, in a neutral manner, and contact a candidate donor SP to donate numbers.
- Receive list of numbers from donor SP and pass them to the requesting SP.
- facilitate dispute resolution.

6.4.1.3 NPAC Modifications

There are several other types of modifications that may be necessary but which need to be analyzed further. UNP may result in greater capacity and performance requirements for

the NPAC systems. This may be in the form of transactions per second (TPS), as well as a requirement to handle a greater number of records.

Depending on the cost recovery method, there may be a requirement to identify ports that are attributable to UNP vs. LNP or other LNP based functions. The NPAC may need development to support this function.

6.4.1.4 Service Provider LNP Network Systems

As is the case with pooling, there is a potential requirement for the SP Network Systems to add capacity to handle the increase in the number of records that would be required for UNP.

6.4.1.5 Service Provider Interface to UNP Coordinator

SPs will be required to allocate resources to assure timely interaction with the UNP Coordinator. This interaction, which may require some level of SP mechanization even in an interim deployment, will be necessary for requesting resources, responding to requests from the Coordinator, identifying potential numbers which are available for assignment, and verifying that those numbers are not being utilized for other purposes (e.g., billing, etc.). The degree of this mechanization may vary from SP to SP.

6.4.1.6 Service Provider Operational Support Systems

In a UNP environment, SPs will need to support the periodic reporting process to the UNP Coordinator and the specific request process. To do so may require the following functionalities:

- Identification of the quantity of TNs available for UNP for periodic reports.
- Ability to initiate or receive a UNP request to/from the UNP Coordinator.
- Verification that the available number(s) are not being utilized for other purposes at the time of the request (e.g., billing).
- Availability of a list of available TNs to satisfy a specific UNP request.
- Ability to port out a non-working number for which there is no existing customer/account information.
- Ability to initiate a LSR to another service provider to port in a non-working number.
- Marking or removal of the re-allocated number from the TN administration system (including reseller TN lists) and/or the switch.

For an interim deployment of UNP, SPs may elect to minimize the mechanization of these items. Some of the functionalities identified above, however, are unique to UNP and may require system development, depending on the SP. For example, verification of available TNs is often accomplished in the Service Order Process. Identification and verification of

TNs without issuance of a service order by the donor SP may require manual intervention or mechanization. In addition, several SPs have noted that their current LNP provisioning processes do not allow for porting of unassigned numbers. Consequently, further development may be required.

The costs associated with such mechanization have yet to be quantified.

Integration of wireless SP's OSS into the LNP processes may require further modifications to support UNP.

6.4.1.7 E911 Modifications

No costs specific to UNP deployment have been identified thus far. However, there may be some costs to modify E911 systems to remove the association of CO code to switch. Although this modification is not directly attributable to UNP, to the extent that UNP substantially increases the volume of ported numbers, it may accelerate the need to make the necessary changes to the E911 systems. See section 9 for more details on this issue.

6.4.2 End User

UNP should introduce no direct costs to the end user. It should be acknowledged, however, that costs incurred by SPs may eventually be recovered through end users. Cost recovery will need to be addressed by appropriate regulatory entities. Optimally, this will be addressed prior to implementation of UNP.

6.5 Benefits of Measure

In areas where NPA exhaust has occurred prior to NPA relief, UNP will benefit SPs who do not have adequate unassigned numbering resources and their customers by providing the ability to obtain numbering resources from other SPs.

6.6 Technical Considerations

6.6.1 Interoperability

In order for UNP to be competitively neutral, it is imperative that processes are developed to ensure reciprocal implementation. This means that each SP should provide the same level of response to the UNP Coordinator. This will need to be addressed in UNP administration guidelines.

6.6.2 Service Provider Inventories

It is assumed that UNP will not be used to build or replenish SP inventories.

There are multiple technical reasons for SPs' requirement to have access to an adequate service provider inventory of TNs. SPs require their own inventories in order to allow them to be able to provision service to meet their customer demands, including having sequential numbers available for multi-line customers. Wireline SPs perform pre-provisioning in order to meet same-day service demands wherever possible. Wireless SPs

require SP inventories in order to meet “instant” service activation demand for almost every new customer.

Current and planned network elements and systems for both wireline and wireless SPs are not designed to operate without the presence of an SP inventory. For some SPs, continued operation in an environment which no longer accommodates individual SP inventories will be unacceptable

CMRS customers expect instant service activation; many CMRS sales channels operate outside normal business hours. In addition, wireless phones are often preprogrammed with a TN. As such wireless operational models and/or industry definitions of SP available TN inventories may need to be reconsidered. For example, TNs in preprogrammed wireless phones or on resellers lists may not be considered as part of a wireless SP’s available TN inventory for the purposes of donating TNs for UNP. Conversely, it may be permissible for TNs obtained through UNP to be used to preprogram wireless phone and/or establish reseller lists subject to guidelines.

Since SPs will be obtaining TNs through other SP’s inventory, UNP will result in a reduction in the donating SPs control of its TN inventory, and a reduced ability to forecast future numbering needs. The degree to and circumstances under which an SPs inventory and forecasted demand can be protected must be addressed in the guidelines.

The donating SP may need to continuously remove numbering resources from their inventory. Some SPs suggest that this may require a significant manual effort.

6.6.3 OSS Impacts

The impact of UNP on SPs' provisioning and support systems (e.g., OSS) is expected to vary by company. The largest impact may be to incumbent LEC systems, which were designed to interact with large (internal) inventories of TNs, where the first six digits (i.e., NPA/NXX) of any TN could be used to identify a single switch and a single SP. A key component of such systems is a mapping of each street address to an NPA/NXX, which in turn, is used to identify the serving central office, available features and services, billing cycles, 911 system, etc. Although some modifications were made to accommodate the exporting and importing of TNs under LNP (and in some cases, thousands-block pooling), the linking of street addresses to an NPA/NXX has been preserved. If UNP leads to significant importing for such carriers, this mapping logic becomes difficult to support, since SP numbering resources will be increasingly comprised of random TNs within many different NXXs, all allocated to the same rate area and multiple switches within that rate area. For some SPs significant changes may be required to accommodate UNP in certain ordering, provisioning and billing systems. This issue does not impact an SP’s ability to donate numbers.

From a donation perspective, some SPs may need to modify systems to allow for the verification of number availability outside of the standard service order process. Currently, for these SPs, the issuance of a service order initiates the checking of a number of

downstream systems to ensure that the candidate TN is truly available. In addition, enhancements for LNP in these SPs' systems were designed with the assumption that the exported number was already in service. As such, the porting out of non-working numbers will require additional system modifications.

6.6.4 Network Impacts

6.6.4.1 Switch Impacts

UNP may have impacts in switching systems. To the extent that that SP numbering resources will be increasingly comprised of random TNs within many different NXXs, switching requirements may be necessary in order to allow switches to translate additional NPA-NXX combinations. Additionally, in the event that there is determined to be a need for a unique UNP indicator in the switch, in addition to the LNP indicator, switch development will be required.

UNP could also have an impact on SPs' ISDN packet routers. Such devices do not have LNP query capabilities and as such, must build 10-digit routing translations on each UNP TN used for packet services. This will require significant manual effort, and may quickly exceed the routing table capacity of the packet routers.

6.6.4.2 LNP System Impacts

UNP may impact the LNP System loads since it will increase the quantity of numbers "ported". Depending on the size of the increase, there may be impacts to SPs' SOA, LSMS and LNP Network Databases.

Modifications will be needed to the LSMS and possibly other downstream systems to support a UNP indicator, if such an indicator is needed.

6.6.4.3 NPAC SMS Impacts

UNP increases the quantity of Ported TNs. An increase in ported numbers means that the NPAC SMS must process more LNP transactions and store more LNP records (pending, active, and old subscription versions). Thus, UNP may require increased record storage capacity at the NPAC SMS and may require increased throughput capacities.

6.7 Impact on Competition

6.7.1 Equal availability of numbers

UNP does not ensure equal availability of TNs to any SP. However, UNP allows SPs with "insufficient TNs" (as defined above) available in their inventory to obtain available TNs to continue to provide service to their customers. Despite this improvement it should be noted that SPs with sufficient TNs available in their inventories can continue to provide service on a business as usual basis. Conversely, SPs without available TNs will be subject to the UNP process and any inherent delays associated with that process in order to provide similar service.

UNP does not increase the equal availability of numbers to SPs that are not LNP capable.

UNP could allow an SP who has inefficiently managed its TN inventory to avoid the consequences of its actions at the expense of an SP practicing prudent TN management. For example, an SP may have managed its TN inventory to maintain sequential blocks of TNs. These blocks would then be available for UNP to another SP who had not exercised similar prudent TN management. This has potential negative business impacts on a donating provider who has exercised prudent TN management. As such, guidelines need to be developed to prevent this from occurring.

6.7.2 Implementation Impacts

6.7.2.1 Out of Area

Non LNP-capable service providers which deliver traffic directly to end offices where UNP is utilized, will encounter increased charges for dipping this traffic. This is because the use of porting for UNP means that more numbers will be "ported numbers" than if an LNP-based UNP arrangement were not in effect.

6.7.2.2 By All Service Providers

CMRS providers are not currently required to implement LNP until March 31, 2000. In addition, these entities are only required to implement LNP in the top 100 MSAs where bona fide LNP requests are made nine months prior to the date –scheduled by FCC mandate. At the same time, other wireless service providers, such as paging, mobile satellite, narrowband PCS, most specialized mobile radio service providers, and some wireline carriers may be exempt from LNP requirements entirely.

Non-LNP capable SPs cannot participate in UNP. Thus, any decision to implement UNP should consider, among many other factors, the relative number of SPs that can participate, the quantity of available TNs eligible for UNP, and the impact on non-LNP capable SPs.

6.7.2.3 Disproportionate

To the extent that some SPs have not mechanized the LSR porting out process at the time UNP is implemented, some SPs will not be able to port TNs on a reciprocal mechanized basis. This results in a disproportionate impact on those SPs who must support a manual LSR porting-in process.

UNP has the potential to create disproportionate impacts as it may permit LNP capable SPs, but not non-LNP capable SPs, access to additional numbering resources.

6.8 Consumer Issues

6.8.1 Users/Services Impacts

Absent UNP in jeopardy situations, customers needing new numbers might not be able to receive service from the provider of choice. UNP could make TN(s) available to meet a

customer's need, but not with the same level of service as would be expected had a number been available in the SPs inventory.

Some degree of manual processing will be required for UNP. This may result in an overall degradation in the provisioning of customer service as compared to the circumstance where the service provider had numbers in its inventory. This degradation may be area specific (i.e., customer requesting service in one rate area may be accommodated sooner than customers residing in another rate area). Some examples of the types of customer service degradation are:

- Customers inability to choose numbers from a list of TNs.
- Increased interaction time between the SP and the customer.
- Increased opportunity for error in the provisioning process.
- Delay in customer receiving notification of TN.
- Customer may not be able to purchase wireless phones with the number preprogrammed.
- Delays in the provisioning of customer service

Delays in customer provisioning are caused by the inability to pre-provision customer service, the requirement to use the LNP process, and from sales channels operating outside of the normal business hours.

However, UNP is an improvement over not having any numbers and having to wait for either a new CO code or NPA relief.

UNP affects new and growth customers, not customers that are porting from one SP to another.

6.8.2 Dialing changes

No dialing changes are required.

6.9 Public Safety Issues

UNP relies on the same technology as LNP for the association of working TNs with SPs and their switches and thus does not introduce any additional known public safety issues. However, because ported TNs are routinely available for assignment in an LNP-based UNP environment, there will be an increase in situations where a TN will become associated with a customer located outside the NXX-assignee's wire center boundary, although within the same rate area. There is also a potential need to build a history file that associates past and present SPs for each working TN that is accessible by all public safety agencies. Since manual processes are involved in UNP, dependent on the specific SP implementation, consideration should be given to ensure that information on activated UNP TNs are properly forwarded to E-911 databases.

Numbers required for current and projected wireless 911 purposes should be considered unavailable for UNP purposes.

Investigation of UNP impacts should be sought from appropriate public safety agencies, e.g., NENA, APCO, etc., and should be addressed prior to proceeding with UNP implementation in wireline and wireless networks.

6.10 Other Considerations

6.10.1 Regulatory and/or jurisdictional considerations

The FCC is currently addressing the jurisdictional issues associated with NANP administration, NPA relief and number conservation.

There may be unique regulatory issues associated with the implementation of UNP that may need to be addressed. (e.g., the transfer of TNs allocated to one SP to another SP.)

6.10.2 Conditions under which benefits can be maximized

- The quantity of available TNs.

A sufficiently large inventoryof TNs is a necessary consideration.

- The number of participating SPs.

A larger number of participating e SPs will make the measure more effective.

- Implementation of UNP substantially in advance of the scheduled relief date for the NPA

Consideration should be given to the length of time UNP could be used in an NPA area. There may be relatively greater benefits from UNP when there is a significant period of time between UNP implementation and scheduled NPA relief.

6.11 Conclusions

UNP is a TN sharing and/or optimization method in which available TN's in one SP's inventory are ported to another SP using LNP/LRN.

The focus of this report is on using UNP in situations where SPs have insufficient number resources for assignment in areas that are in code jeopardy. The impacts of UNP implementation in other situations have not been explored at this time. If directed by NANC, the NRO-WG will investigate the ramifications of implementing UNP outside of jeopardy situations.

6.12 Minority Opinions

6.12.1 Minority Opinion Of MCIWorldcom on Unassigned Number Porting, October 19, 1998

MCI WorldCom wholeheartedly supports the Number Resource Optimization Working Group's (NRO-WG) Mission to "assess and recommend strategies that ensure adequate and competitively neutral availability of numbering resources to all end users and service providers while optimizing the use of numbering resources." Unfortunately, the NRO description for Unassigned Number Porting (UNP) falls far short of its potential to maximize efficient and competitively neutral allocation of telephone numbers, and to support increased consumer choice of numbers. As framed by the NRO-WG, use of UNP is restricted to the most extreme NPA jeopardy situations, with no attempt to include any level of customer number choice in the basic process, thus making only a fraction of UNP's potential benefits available to end users and service providers. For these reasons, as summarized below, MCI WorldCom dissents from the UNP section of the NRO report to NANC.

Overly Narrow Definition

To date, UNP has been narrowly defined and described only for those situations where available numbering resources have been depleted to the extent that individual service providers are otherwise unable to obtain any telephone numbers (i.e., extreme jeopardy situations). Although the very same administrative and technical foundation necessary for this type of UNP implementation would also allow for the matching of specific customer needs when porting an available number from one service provider's inventory to another, this potential use of UNP and its benefits -- enhancing the competitively neutral availability of numbering resources to all end users and service providers -- were refused for consideration.

Lacks Broad Implementation Plan

The current implementation timeline suggests that each occurrence (time and place) where UNP is implemented requires the start of a separate and new Request For Proposal (RFP) bid and selection process for a third party UNP coordinator. Such an inefficient and time consuming implementation strategy - rather than a single, unified selection process - would add as many as 14 months to UNP implementation in each area where implementation is selected. Given the jeopardy situations which UNP will provide a benefit, such a lengthy and cumbersome implementation strategy would be highly undesirable and could only serve the purpose of discouraging implementation of UNP all together.

Lacks Recommendation to Continue Planning

The report fails to recognize the need for and identify a plan to continue working on UNP implementation pending a regulatory order. The NRO report assumes that no

further development for UNP will be undertaken until after a directive from the FCC. However, the benefits of UNP could be available more quickly if the industry continued to move forward now with UNP planning tasks, such as determining UNP requirements and UNP coordinator guidelines.

6.12.2 GTE AND WINSTAR MINORITY COMMENTS ON NRO ITN (Individual Telephone Number) UNASSIGNED NUMBER PORTING (UNP) REPORT, OCTOBER 12,1998

INTRODUCTION

The purpose and intention of these comments is to highlight additional considerations that do not appear in the report, to elaborate on certain issues raised in the report and to provide a needed conclusion to the report. GTE and WinStar have participated in the ITN Task Force that generated this report. However, certain comments and concerns expressed by GTE and WinStar and others are not reflected in the report due to time constraints and controversial procedural decisions that took place in the generation of this report.

GENERAL COMMENTS

The UNP concept is tied to a weakly defined set of extenuating circumstances that can only be realized if existing industry NPA code relief guidelines are ignored. The UNP technique is totally dependent on, yet to be developed UNP assignment guidelines. Finally the concept of taking already allocated numbers from one service provider (SP) and transferring those resources through a porting process to a competitor is a questionable action that can be challenged on legal/regulatory grounds. This is not to say that UNP has no conceptual merit, the industry focus however should be on long term competitively equitable solutions. Therefore, GTE and WinStar recommend that industry efforts would be more productively spent in making sure that the circumstances leading to "insufficient numbers available for assignment for a specific customer request for service on a rate center basis" should never occur. Diverting those resources and allocating them with a technique like interim UNP does little to solve a jeopardy situation.

The UNP concept essentially rewards SPs who have no TNs (or who have inefficiently managed their allocated numbering resources) with the right to raid other providers who have planned and efficiently managed their numbering resources. UNP can disrupt a company's business plans, and allows for the perpetuation of an extreme jeopardy condition.

Additionally, this technique will also allow SP's to "cherry pick" and accumulate numbering resources from others under the guise of having insufficient numbers to satisfy their customer's demands during a jeopardy situation.

UNP may cause small companies to adopt a whole new internal process to enable their competitors both large and small to have access to their allocated resources. In most circumstances CLECS will become the net donors of this process since they will have the greatest quantity of unassigned numbers from NXX codes that they have been assigned in competitive rate areas.

SPECIFIC ISSUES

The conditions for interim UNP are too loosely defined. GTE and WinStar recommend that the UNP report more clearly delineate the exact circumstances under which UNP would be exercised. It must be clearly stated that a requesting service provider does not have adequate numbers to fulfill an existing service order. There should be strict, enforceable guidelines that govern an SP's ability to request UNP resources for an anticipated or unconfirmed service request, or a service request dependent on the ability to obtain numbers. A lack of these details will allow SPs to game this process. An additional impact of the currently specified UNP process could give customers the incentive to shop around from SP to SP with the objective of giving their business to the first SP that will provide them with numbers. This situation will not benefit the SPs without numbers nor will it benefit end users seeking service. Rules are therefore, required to discourage such "shopping".

The time frame section is misleading, since UNP will most likely be challenged both in the regulatory arena and in the courts. This factor alone could add many months to any initial deployment. UNP is not a sharing of resources between SP's. It is rather a taking of resources from one SP by another. In addition, certain entries in the timetable that indicate 0-X months are at best, optimistic. A number greater than 0 must be inserted. (For example 0-15 months for deployment testing is misleading.) Since most SPs will need to institute manual procedures to support UNP, testing will be necessary for a significant period of time. To imply that this concept can be implemented with no testing is unrealistic. It is obvious from a GTE and WinStar perspective that UNP will take at least 2 or more years to initiate in any environment. This is a additional burden on allocated resources since pooling will already be in place in these same locations and the prerequisite conditions for UNP activation should never materialize.

The section on "Conditions under which benefits can be maximized" definitely needs greater detail. The irony of this section is that for UNP to realize its greatest benefits the circumstances that are required (i.e., extraordinary jeopardy or total NXX code exhaust) should never be permitted to exist. In fact, it is the avoidance of these specific circumstances that are the objectives of all the industry NPA code relief guidelines, and all the pooling administrative guidelines. If the UNP circumstances were to materialize, it can only mean that either the industry guidelines are not being followed, or that the guidelines themselves are defective. This information needs to be captured in the report.

RECOMMENDED CONCLUSION SECTION

The following is GTE's and WinStar's recommended text for the conclusion of the UNP report.

> This report contains a description of interim UNP, the assumptions for its implementation time frame, and high level UNP technical considerations and various impacts. Based on these considerations, the negative impacts on the telecommunications industry and on end users could well outweigh the one perceived

benefit. The sensibility and legality of such a technique is questionable, particularly since its actual implementation is based on undefined guidelines and apparent costly impacts on small service providers. Interim UNP could make it exceedingly difficult for SPs to plan their businesses. In the end customers could be forced to suffer delays in obtaining numbering resources, rather than addressing the real problem and avoiding the circumstances that result in jeopardy situations in the first place. Therefore, it is recommended that the industry use this Report to avoid focused future work on the interim UNP concept and concentrate on techniques that mitigate the need for UNP or a similar methodology.

7 Location Portability

7.1 Description

Location Portability, as defined in this document, is the ability of a subscriber to retain a TN when moving outside the current rate area while the TN takes on the characteristics of the new rate area. The boundary for Location Portability needs to be defined and agreed upon by all telecommunications stakeholders in the affected region (e.g., SPs, regulatory bodies and consumers). Conceivably, Location Portability may even involve numbering resource moves between NPAs, LATAs and/or States. The impacts of Location Portability will depend largely upon its fundamental difference from LNP as well as the size of the area in which it is offered.

The following factors must be considered in analyzing any potential proposal for Location Portability:

- Possible replacement of industry billing and rating mechanisms.
- Switching, signaling, and support system modifications necessary to support the proposal.
- Potential changes to LNP databases and SP responsibilities relative to LNP (e.g., the N-1 rule for who does the LNP database dip).
- Identification or redefinition of signaling parameters to support rating and routing in the new environment.
- Managing customers' expectations regarding the geographic significance of a TN.

Managing customers' expectations regarding features and services associated with a TN.

At this time, only one specific proposal has been made for location portability. This proposal, created by Bellcore, is known as the Geographic Unit Building Block (GUBB) proposal. A description if this proposal is included immediatiatly following this section.

7.2 Additional Assumptions

- SPs must still be able to associate the called number with a specific geographic area (e.g., rate area).
- The implementation of location portability should use LNP technology as the base architecture.
- All SPs within the area of location portability must be able to support location portability.
- Any regulatory mandate to implement location portability must include a consideration of cost and cost recovery.
- Equal access dialing and carrier pre-selection requirements will be maintained.

- Existing features and services associated with a TN are switch dependent and may not be available in the new service area.
- Local dialing requirements must be considered (e.g., 1+ as a toll indicator)
- Location portability will be deployed using an industry standard solution.
- SP embedded base of previously assigned NXX's will not be impacted by implementation of location portability.
- The N-1 rules for queries should not change for SPs outside of the area of location portability.

7.3 Implementation Time Frames

- It is estimated that Location Portability would require similar, if not longer, planning, requirements, network, operations and customer care systems development and service provider implementation and testing time frames than was required for LNP. Respondents to the SP cost questionnaire indicated estimates of 4-10 years for implementation.
- Industry network routing, billing, and rating methodologies changes may require careful testing and coordination and must be considered in the implementation timeframe. These activities may or may not extend the implementation timeframe.

7.4 Cost Estimations

Similar to the implementation timeline described above, the costs of location portability are subject to a number of variables unique to each geographic area and service provider. The ATF issued a cost questionnaire to further capture and analyze implementation cost information from End Users, SPs and industry suppliers. Aggregated results have been analyzed and can be found in Attachment 12. It has been difficult to identify an overall cost that is applicable in all areas.

7.4.1 Service Provider

- Costs of SP switching, signaling, LNP database, customer care and operations systems changes would be equal to the support of LNP.
- Service Provider systems that require real time rating of calls will be impacted by location portability (e.g. smart phones)

7.4.2 End User

- Consumers may incur charges that are different from those historically associated with a dialed NPA-NXXX.
- Business customers incur costs to change their CPE systems to accommodate location portability (e.g., New Network Addressing, Least Cost Routing, Local

Toll Determination at the PBX, Local Calling Requirements, Facilities Resale, and Telemarketing Databases.)

7.5 Benefits of Measure

- Consumers are allowed to retain their TNs in a larger but yet to be defined geographic area.
- Other number optimization measures could be utilized over a larger geographic area.
- Switch(es) that serve multiple rate areas could do so with a reduced number of NXXs.

7.6 Technical Considerations

7.6.1 Switch/OSS Development and Administration

- Augmentation or modification of switches to screen, route, and rate on something other than the dialed NPA-NXX.
- Augmentation of LNP databases to include a unique location identifier.
- Modification to signaling systems to transmit unique location identifier across and between SP networks.
- Modifications to Billing, Maintenance, and Provisioning (Network and Customer) Systems to deal with location portability.
- Modification to SP TN administration systems to track TNs across multiple switches and rating areas.
- Potential need to provision toll warning or announcement prior to call completion.
- Changes to the N-1 rules for LNP database dips.
- Potential changes to LNP database capacities directly attributable to location portability
- Possible switch modifications to increase capacity of the number of NXXs served by a given switch.
- Modification or enhancements to systems that require real time rating (e.g. smart phones, PBXs) to enable them to access LNP information.
- Possible changes to networks (e.g., trunking rearrangements including operator service trunks, local dialing plans, and toll recording equipment).

7.6.2 Network Reliability

It is acknowledged that number portability, due to its reliance on external database lookups for call completion, increases the complexity of call routing. It also increases the difficulty in identifying the cause of call failures. To the extent that location portability increases the volume and / or complexity of ported TNs, these concerns are exacerbated and could adversely impact network reliability. For example in the event of an SCP failure more calls will fail to complete because fewer calls will be able to rely upon default routing for call completion.

7.7 Impact on Competition

7.7.1 Equal Availability of TNs

- The method provides continued equal availability of future assignable NXXs to all industry segments.
- Since Location portability can potentially increase the efficient utilization of numbers by increasing the geographic area within which they can be assigned, it has the potential to facilitate greater availability of future assignable NXXs.
- SPs may be less constrained by jeopardy NPA conditions where location portability is available.

7.8 Implementation Impacts

7.8.1.1 Out of Area:

- Interexchange carriers that do not support Location Portability may not be able to properly rate calls placed to a location portability area.
- If not implemented uniformly by all SPs, all service providers in Location Portability areas would have to be able to support location portability

7.8.1.2 Disproportionate

In the current environment, when a subscriber moves he or she is likely to consider changing SPs. Some SPs feel that Location portability is likely to reduce the incentive although not the ability for subscribers to consider changing SPs and as such has the potential to reduce competition and disproportionately impact carriers that are not serving a large embedded base of customers. Other SPs believe that Location Portability would not disincent customers from considering other SPs when considering a move and therefore would not impact competition.

7.9 Consumer Issues

7.9.1 Service Impacts

- SPs' pricing plans and service options available to a subscriber may change when a subscriber moves but retains its number. The pricing plans and service options available to the subscriber would be those associated with the new area, not with the TN.
- A process for toll warning indication will need to be identified and/or changed to signify local versus toll calls to the caller to reduce customer confusion regarding the type of call rating. This process may add to call setup time and may inconvenience or annoy the calling party.

7.10 Dialing Changes

- Depending on the boundary established for location portability, mandatory 10-digit dialing may be required.
- Subscribers who utilize CPE dialing plans may need to make modifications.

7.11 Public Safety

- Emergency services (911) systems would need extensive development to support location portability. As with other impacts identified in the technical considerations section, the extent of the development is dependent on the area of location portability
- Some business subscribers may need to adopt alternative emergency procedures.

7.12 Other Considerations

7.12.1 Regulatory Considerations

It is unclear at present if location portability would be mandated by a regulatory body and if so by which regulatory body. This uncertainty is further complicated by the uncertainty in the area of location portability (e.g., location portability within an NPA, within a LATA, within a State, or between States).

7.12.2 Conditions under which Benefits could be Maximized

- Most or all carriers within the area of location portability are supporting the capability.
- Number Optimization may be maximized in location portability areas that cover a large number of rate areas. This will allow those rate areas to share a reduced quantity of future NXXs.

Subject: Location Portability: GUBB Text

Solution Overview

End User Impacts

The end user impacts of Location Portability can be classified into two broad categories:

- The impacts on customers who port their TN outside the rate center
- End users who call Ported Outside Rate Center ("PORC") DNs.

Customers who port their TNs are impacted for both originating and terminating calls. For originating calls, the PORC customer needs to subscribe to a local calling plan and service features which can be supported by the Recipient Switch. Since different features are supported by different switches and in different geographic locations, the available choices from the Recipient Switch may be different than the choices available from the Donor Switch. For terminating calls, the LEC serving the PORC customer determines what billing policies apply for the PORC service offering. The billing policies implemented by the LECs and other carriers are beyond the scope of this document. The requirements in this document are intended to support a billing policy by which the end user calling a PORC TN would incur the transport charges for the call (see below). In this case, the PORC customer should not incur unusual charges for receiving calls. End users who call PORC TNs are billed for the call according to the billing policies established by the carrier responsible for transporting the call (e.g., the LEC for local calls, the intraLATA toll provider or LEC for IntraLATA toll calls, or the IXC for InterLATA toll calls). As described above, the requirements in the document are intended to support a billing policy by which the end user calling a PORC DN would incur the transport charges for the call. Under this policy, GUBBs, rather than DNs, would be used to determine the charges (if any) applicable to the call. Since these charges (based on GUBBs) may be different from "normal" charges (based on TNs), the network may need to provide a warning tone or announcement that indicates this difference. This billing policy works best if the Originating Switch performs the PORC query and directly routes the call to the Recipient Switch. However, this is not always the case. For instance, the Originating Switch may not support the PORC functionality or the call may originate from outside the area of portability. In these cases, the call may be initially routed to the Donor (or its surrogate) and then redirected to the Recipient Switch. For these rerouted calls, other billing policies may be necessary.

7.12.2.1.1 Call Processing

This section provides an example of how calls to PORC TNs are processed by the network. The critical component of the industry solution for PORC is the GUBB. As described above, PORC TNs no longer have geographic significance (i.e., the NPA-NXX of the TN does not correspond to a fixed geographic area). The GUBB provides the geographic significance for PORC DNs. The GUBB is an identifier that represents the geographic location of the end user. The area of portability (i.e., the area within which

customers may port their TNs) is divided into fixed geographic blocks in the same manner that the United States is divided into LATAs. Every location within the area of portability corresponds to one and only one geographic block. This geographic block is the GUBB. In this document, it is assumed that each GUBB corresponds to an existing Incumbent Rate Center. The GUBB is represented by an NPA-NXX that is already assigned to the Incumbent Rate Center. When a call is placed to a PORC TN, the PORC-capable switch launches a query to the LNP database. The query response includes the LRN of the Recipient Switch and the GUBB for the PORC TN. The PORC-capable switch uses the GUBB (rather than the NPA-NXX of the Dialed TN) to support the following:

- Determining the type of call (Local, Intra-LATA Toll, or Inter-LATA Toll)
- Selecting the type of transport carrier (LEC, intraLATA toll carrier, interexchange carrier, or dialed Carrier Access Code [CAC])
- Generating the proper AMA
- Providing a toll warning (if necessary).

The PORC-capable switch then routes the call toward the Recipient Switch. The outgoing Initial Address Message (IAM) includes the LRN of the Recipient Switch (as the Called Party Number), the PORC DN (as the GAP), the FCI (with both the "M" and "O" bits set to indicate that a PORC query has been performed), and the Terminating GUBB (in the Generic Digits parameter). In addition, the IAM includes the Originating GUBB if the Calling Party is also ported outside the rate center. (In an LNP environment, the IAM includes the Jurisdiction Information Parameter [JIP], which identifies the originating switch.) Intermediate Switches route the call normally based on the Called Party Number (which contains the LRN of the Recipient Switch). The Recipient Switch completes the call to the PORC TN. Location Portability works best when all originating switches within the area of portability are PORC-capable. (Requirements in this document do, however, provide for the case where some switches/networks are not PORC-capable.) In the following example, the PORC query will be performed by the Originating Switch. As a result, the Originating Switch can ensure that the calling party's preferred carrier is used to transport the call and that the proper AMA is generated. The Originating Switch can also provide a toll warning (if necessary). This approach helps to ensure that service features that rely on the geographic significance of dialed TNs (e.g., toll restrictions) can operate properly. For calls incoming to the area of portability, it is assumed that a switch in the IXC network performs the PORC query. The IXC network can route the call directly to the Recipient Switch, generate the appropriate AMA, and provide a toll warning (if necessary).

This call flow proceeds as follows:

> The calling party dials a PORC DN [732-758-1111]. A PORC query is performed because 732-758 is a Portable NPA-NXX. If the call originates within the area of portability, the Originating Switch will perform the PORC query. If the call originates from outside the area of portability, a PORC-capable Switch in the

incoming IXC network will perform the PORC query. The LNP DB performs a 10-digit look-up on the Dialed TN. If the Dialed TN is ported outside the rate center, the LNP DB returns a PORC query response to the switch that includes the LRN of the Recipient Switch and the GUBB applicable to the PORC DN. The switch performs Post-PORC-Query call processing. If the call originates within the area of portability, the Originating Switch will use the GUBB to determine the transport carrier and AMA. If the call originates from outside the area of portability, the PORC-capable Switch in the incoming IXC network will use the GUBB to determine the AMA. The network provides the toll warning (if necessary). This warning tone or announcement could be provided by the switch or an Intelligent Peripheral. The switch routes the call to the Recipient Switch. If the call originates within the area of portability, the Originating Switch will use the transport carrier to deliver the call to the Recipient Switch. If the call originates from outside the area of portability, the incoming IXC network will use its normal routes and facilities to complete the call to the Recipient Switch. For inter-switch calls to the Recipient Switch, the IAM includes the LRN of the Recipient Switch (as the Called Party Number), the PORC DN (as the GAP), the FCI (with both the "M" and "O" bits set to indicate that a PORC query has been performed), and the Terminating GUBB (in the Generic Digits parameter). Intermediate Switches route the call normally and generate AMA (if needed). Any PORC-capable switches in the call path that normally generate AMA will also include the GUBB within the AMA record. The Recipient Switch completes the call to the PORC DN according to the call completion procedures for LNP.

7.12.2.1.2 Network Impacts

This section identifies the impacts on Advanced Intelligent Network (AIN) Service Switching Points (SSPs) and the LNP Database. The specific technical impacts on each Network Element (NE) are as follows:

Switches Within the Area of Portability: Location Portability works best when all end-office switches (originating, donor, and recipient) within the area of portability implement the functionality to support PORC, as described in this document. This includes the ability to perform Post-PORC-Query call processing on the GUBB to support carrier selection and AMA generation. It may also support functionality to provide a "toll warning." In addition, toll carriers in the area of portability should implement PORC-capabilities in order to properly rate and route calls incoming from outside the area of portability. However, this document provides requirements for default PORC processing at the Donor Switch (or its Surrogate), in case a call to a PORC TN is routed to the Donor Switch. LNP SCP. The LNP SCP must store a GUBB and LRN for each PORC TN and respond to PORC queries. In addition, to support calls that were default-routed (without a PORC query) to the Donor Switch, it also includes redirecting information (charge number, carrier) to complete the call leg from the Donor Switch to the Recipient Switch. See

Table 3-1 for an example of how an LNP SCP might be populated to provide responses to LNP queries in a PORC environment.

AIN Intelligent Peripheral: The AIN IP may support functionality to provide a "toll warning."

Other NEs: The implementation of GUBBs to support PORC will also have a significant impact on other NEs and systems. These include Operator Services Systems (OSSs) and the toll-free (800/888) database.

This solution can support the movement of DNs between rate centers and between LATAs. This solution can support arbitrary areas of portability (LATA, state, etc.). The area of portability is only limited by the following: (1) the ability of LNP databases to store LRNs and GUBBs for DNs deployed over a wide geographic area, (2) the ability of switches to access the necessary LNP databases during call setup, (3) the administration of LRNs and GUBBs over a wide geographic area, and (4) end user expectations about billing and the geographic location of DNs.

7.12.2.1.3 Assumptions, Dependencies, and Constraints

The requirements in this GR are based on the assumptions in GR-2936-CORE, in addition to the following assumptions:

- An LNP-capable switch conforms to the requirements set forth in GR-2936-CORE.
- An LNP capable switch is able to perform an LNP query and is able to swap the Generic Address Parameter/Called Party Number (GAP/CdPN) information.
- In a PORC environment, both the recipient and donor switches should be LNP(LSPP) capable.
- A PORC-capable switch is an LNP-capable switch which supports the PORC requirements defined in this document.
- In a PORC environment, the donor switch is not required to be PORC-capable.
- If the donor switch is not PORC-capable, it is assumed that a surrogate donor switch is PORC-capable.
- In a PORC environment, the recipient switch is required to be PORC-capable.

GUBBs are used as the vehicle for identifying the geographic location of the end user. In a PORC environment, it is expected that PORC-participating networks will use GUBBs to provide the geographic location of the end user. No assumptions are made on non-PORC-participating networks. The GUBB is a 6-digit number that should use an NPA-NXX format, and at cutover should use existing rate centers and a representative NPA-NXX that is assigned and working in each rate center. The GUBB identifies the geographic area to which the end user ports. The GUBB supports the classification of the call as local Extended Area of Service, Toll-IntraLATA or Toll-InterLATA based on the

calling and called party's respective GUBBs. The GUBB will be assigned as a line attribute only if the line is ported outside the rate center. The LRN is used for routing and the GUBB is used for carrier selection and rating purposes. No new requirements will be placed on non-PORC participating networks and their NEs. However, as stated previously, PORC works best when all carriers/switches in the area of portability are PORC-capable. Calling parties served by non-PORC participating networks will not experience any difference in how a call to a PORC number is rated (i.e., the call will be rated based on the dialed TN rather than on the GUBB). Carrier selection for toll calls will be made by the billed party. The FCI M Bit will be set for all LSPP and PORC query/response interactions at an SSP. The M-Bit set indicates an LSPP LNP query has been performed. Since the PORC query encompasses LSPP translations and responses, it is appropriate to set the M-Bit following a PORC query/response. The FCI O bit will be set when a PORC query/response is completed. A PORC-capable switch will always send a PORC query with a PORC trigger criteria type. Location Portability within a state and its subsets and rate center change within a state and its subsets will be supported. This is a reflection of the jurisdiction of state public utility commissions and their potential LNP decisions. Exceptions to this may be made for cross-boundary situations. If a recipient switch serves more than one rate center, and if a call to a PORC DN is routed to that switch without a PORC translation having been completed (i.e., without the O Bit having been set), then a PORC query is needed to obtain the appropriate carrier and charge number information for the call leg between rate centers served by that switch. With regulatory relief, this situation may be alleviated and the PORC query avoided.

PART C: MEASURES THAT DO NOT REQUIRE LNP

8 NXX Code Sharing

8.1 Description

NXX code sharing proposes that an NPA-NXX associated with a specific rate area be distributed among the service providers that serve that rate area. For example, if there were 10 carriers serving subscribers in a given rate area, the NPA-NXX would be assigned by 1000s blocks to a specific switch in each service provider's network. Accordingly, switches would be identified by NPA-NXX-X, rather than the current 6 digit (NPA-NXX) identification.

Code sharing requires SP switches and support systems to uniquely screen, route, and bill calls using the 7th digit (I.e. NPA-NXX-X). It is important to note that sharing of blocks within an NXX requires unique modification in switch routing tables, translation, and operations support systems. This differs from 1000s block pooling in that pooling utilized the existing LNP technology to share the numbers.

8.2 Additional Assumptions

- NXX code sharing will be contained within a single rate area.
- Assumes no local number portability has been implemented, therefore no capability to route on an LRN (Location Routing Number).
- Current industry call rating methods will be maintained.

Code Sharing through the use of 7 digit routing translations (i.e. NPA-NXX-X) and notification in the Local Exchange Routing Guide (LERG) was examined. This initial examination suggested that wide scale use of 7-digit routing would require substantial development in SP's Switches, Operations Support Systems and Signaling networks. The implementation timeframe is estimated to be between 2 and 3 years after completion of firm requirements. These developments are unlikely to be available substantially prior to wide scale availability of permanent number portability or LNP based 1000s block number pooling. It was determined that it was not productive to complete the analysis of NXX-X Code Sharing based on 7 digit routing translations. Use of LRN LNP based 1000s block pooling is a more technically efficient means of number optimization.

9 Code Sharing Using Route Indexing

9.1 Description

The route indexing number optimization method proposes the use of an interim form of number portability, route indexing, to share codes among a variety of carriers. For example, if multiple carriers need numbering resources in a rate area, one SP would implement route indexing on its switch such that all calls would be directed to that switch and then redirected for termination to the appropriate SP switch.

It is important to note that switch and OSS modifications may be needed to support this method.

Code Sharing through the use of Route Indexing was examined. This initial examination suggested that wide-scale use of route indexing would require substantial development in SP Switches, OSS and signaling networks. These developments are unlikely to be generally available prior to wide scale availability of LNP-based 1000s block number pooling. It was determined that it was not productive to complete the analysis of Code Sharing based on route indexing. Use of LRN LNP based 1000s block pooling is a more technically efficient means of number optimization.

10 Mandatory 10 digit Dialing

10.1 Description

10-digit dialing mandates a standard 10 digit dialing pattern for all local calling. This section envisions the 10 digit dialing measure as a means to facilitate the recovery of NXX codes that were previously protected[29] and the potential expansion of the d digit to include 0 and/or 1[30].[31] In a mandatory 10 digit dialing arrangement, ALL local calls dialed will require 10 digits. This is true whether the dialing party is dialing the Home NPA (HNPA) or a Foreign NPA (FNPA). 10-digit dialing is the general rule, however, this proposal does not necessarily affect special access codes (N11), 555, or 950 (feature group B)[32].

Denver, Atlanta and Maryland have already completed the conversion to 10-digit dialing. In numerous other locations, such as, Dallas, Houston, Pennsylvania, Washington State, and Kentucky, the industry is in the process of converting to mandatory 10 digit dialing. These implementations of 10-digit dialing are in conjunction with an overlay as area code relief.

10.2 Additional Assumptions

- LNP is not a prerequisite for implementation of mandatory 10-digit dialing.
- Customer education concerning the dialing change will be required.
- The implementation could be a phased process. The first phase could be the reclamation of protected codes. A later phase could the expansion of the "D" digit.
- 10 digit dialing could be implemented on a National, State, or NPA basis.
- 10-digit dialing is not required to reclaim protected codes.

10.3 Implementation Timeline

Translations work necessary to accomplish 10-digit dialing varies depending on the current situation within the specific NPA being considered. The longest time element associated with this dialing pattern conversion would need to be allotted for customer education and permissive dialing. The time period is estimated at approximately 12 months. The respondents to the SP cost questionnaire indicated that conversion to

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[29] Protected codes are codes not available for use, typically because they are being used in close geographic proximity in an adjacent NPA or for special services (e.g. N11 codes)

[30] INC NANP expansion.

[31] Some states, for example, California, use 1+10 digits for local calling rather than 10 digits.

[32] "Uniform NATIONAL Dialing Plan, INC 97-0131-017, 1/31/97, p. 4, fn1"

mandatory 10 digit dialing would take 3-8 months. At least one respondent indicated that this time frame did not include expanding the "D" digit.

Recovery of protected codes could be done coincident with the introduction of 10-digit dialing. Expansion of the "D" digit is expected to be a multi year process. The implementation timeframe for expansion of the "D" digit was not provided in responses to the cost questionnaires.

10.4 Cost Estimation

Similar to the implementation timeline described above, the costs of mandatory 10-digit dialing are subject to a number of variables unique to each geographic area and service provider. The ATF issued a cost questionnaire to further capture and analyze implementation cost information from End Users, Service Providers and Industry Suppliers. Aggregated results have been analyzed and can be found in Attachment 12. It has been difficult to identify an overall cost that is applicable in all areas.

As indicated in the description section, several areas have already implemented 10-digit local dialing in conjunction with area code relief.

10.4.1 Service Providers

Cost associated with implementation involve the following components:

- Switch Translations
- Changes to announcement systems
- Directory Publishing
- OSS modifications
- Customer education and notification

10.4.2 Potential costs for End Users of Telecommunication Services

- Customers may incur cost associated with changing such items as advertising, stationery, signage, etc.
- Various CPE may need to be reprogrammed or replaced to do ten-digit dialing.(e.g. faxes, auto dialers, alarm systems, modems, and other dial access equipment)
- customer databases will need to be updated to include 10 digit TN's.

10.5 Benefits of Measure

10.5.1 Qualitative

As 10-digit dialing is implemented in more areas of the nation, customer confusion resulting from inconsistencies in dialing patterns from one area to the next is eliminated.

Converting to mandatory 10 digit dialing separate from NPA relief will allow all future NPA relief to be less disruptive to the end user. One of the major issues associated with NPA relief projects (i.e. changes in dialing patterns) could be minimized, thus increasing the potential of shortened regulatory decisions on NPA relief projects.

10.5.2 Quantitative

10.5.2.1 Reclamation of Protected Central Office Codes (NXXs)

The NANC has issued a recommendation, in response to area code relief inquiries, saying that protected codes should be eliminated. Some NPAs continue to have varying quantities of protected codes.

Some areas, which have multiple NPAs in the local calling area, have "protected" NXX codes in order to maintain 7-digit local dialing within a community of interest. As a result, NXXs assigned in one NPA in the community of interest would be protected (or made unassignable) in the adjacent NPA. This permits every switch in the local calling area to route calls based on the NXX (rather than the NPA-NXX), even across NPA boundaries.

If mandatory 10-digit dialing were implemented in these areas, the combined total of protectedNXXs assigned in both NPAs would be made available for assignment[33]. Depending on the number of protected NXXs assigned, a 10-digit dialing mandate would substantially increase the availability of NXXs within both NPAs in the community of interest.

10.5.2.2 Expansion of "D" Digit

By industry agreement, certain NXXs are restricted from assignment. The NXXs that have been restricted are those that begin with zero (0) or one (1). Zero and one are used by switches to access operators, toll dialing and/or inter-NPA calling. If mandatory 10-digit dialing were implemented, the NXXs beginning with 0 and 1 could be made available for assignment. This would increase the quantity of NXXs available within an NPA by approximately 25%.

Expansion of the “D” digit is under study by the Industry Numbering Committee, North American Numbering Plan Expansion Workshop.

10.5.3 Quantitative

10.5.3.1 Reclamation of Protected Central Office Codes (NXXs)

The NANC has issued a recommendation, in response to area code relief inquiries, saying that protected codes should be eliminated. Some NPAs continue to have varying quantities of protected codes.

[33] In the following example from the Kansas City area, 470 codes are assigned in the local calling area (149 for the 816 NPA, 321 for the 913 NPA), 470 additional codes would be made available.

Some areas, which have multiple NPAs in the local calling area, have "protected" NXX codes in order to maintain 7-digit local dialing within a community of interest. As a result, NXXs assigned in one NPA in the community of interest would be protected (or made unassignable) in the adjacent NPA. This permits every switch in the local calling area to route calls based on the NXX (rather than the NPA-NXX), even across NPA boundaries.

If mandatory 10-digit dialing were implemented in these areas, the combined total of protectedNXXs assigned in both NPAs would be made available for assignment[34]. Depending on the number of protected NXXs assigned, a 10-digit dialing mandate would substantially increase the availability of NXXs within both NPAs in the community of interest.

10.6 Technical Considerations

10.6.1 Switch/OSS Development and Administration

10.6.1.1 General

- The Switch must be equipped for mandatory 10 digit local dialing. This may include translations work.
- New announcements may need to be provided.
- OSS modifications may need to be made.
- Mandatory 10-digit dialing increases holding times associated with various network components. As such additional hardware and software may need to be deployed.

10.6.1.2 Protected Code Reclamation

No technical considerations, beyond those identified for general mandatory 10-digt local dialing and opening of NXXs, have been identified.

10.6.1.3 Expansion of the “D” digit

It should be noted that there are significant technical implications that must be addressed before opening the “D” digit.

- Many, if not all, switches will require modifications to allow calls with a zero or one in the D digit to be completed in the public switched telephone network.
- Modifications are also required to various types of Customer Provided Equipment (CPE).as noted above.
- SPs may have already implemented these restricted NXXs for intra-network use. Since 0XX and 1XX would now not be available for intra-network routing, an

[34] In the following example from the Kansas City area, 470 codes are assigned in the local calling area (149 for the 816 NPA, 321 for the 913 NPA), 470 additional codes would be made available.

alternate technical solution would need to be identified, developed and implemented.

- OSS modification and/or replacements would need to be made to recognize 0XX and 1XX as dialable and assignable numbers. The extent of these changes will vary from SP to SP.

10.6.2 Network Reliability

None identified at this time.

10.7 Impact on Competition

10.7.1 Equal Availability of numbers.

- The Method provides continued equal availability of future assignable NXXs to all industry segments.
- To the extent that SPs are restricted in their ability to get numbers to serve customers, reclaiming protected codes or opening the "D" digit may alleviate this situation.

10.7.2 Implementation Impacts

10.7.2.1 Out of Area

Expanding the "D" digit must be done at the same time by all participants in the North American Numbering Plan.

10.7.2.2 If not uniformly implemented by all service providers.

If not implemented by all service providers in a timely manner, calls may not complete.

10.7.2.3 Disproportionate

None identified at this time.

10.8 Consumer Issues

10.8.1 User/Services Impacts

Users will need to incorporate dialing changes which permit the use of zero and / or 1 as a "D" digit.

10.8.2 Dialing Changes

- Implementation of 10-digit mandatory dialing would have an effect on customers by requiring an additional 3 digits to be dialed to all home NPA local calls as compared to the most common current local dialing pattern.

- Consumers have objected to the additional time and inconvenience experienced when it is necessary to add 3 digits to calls previously dialed with 7 digits[35].
- Some research indicates that the young, the elderly and the memory impaired may be especially impacted by the change to 10-digit dialing. Where 911 is not in place this problem could be of particular concern.
- There may be disruption to users due to the need to reprogam CPE .(faxes, auto dialers, alarm systems, modems, and other dial access equipment),to do ten-digit dialing.
- Changes may need to be made to stationery, advertising, signage, etc.

10.9 Public Safety Issues

- Some PSAP system upgrades may be required to display full 10-digit TNs.
- Where implementation of mandatory 10-digit dialing replaces a mixture of 7 and 10 digit dialing, mis-dialed calls to public safety agencies could be reduced. This benefit is limited to areas that have not implemented 911.
- In the transition from 7 to 10-digit dialing, the incidence of mis-dialed calls to public safety agencies could increase. This concern is limited to areas that have not implemented 911.
- Some Alarm and Security systems may need to be reprogrammed to dial 10-digits.

10.10 Other Considerations

10.10.1 Regulatory and/or Jurisdictional Consideration

- Mandatory 10-digit dialing requires regulatory action.

10.10.2 Conditions under which Benefits Could be Maximized

- This measure is most effective in areas that have a significant number of protected codes.
- This measure is most effective under conditions where there is a mix of 7 and 10 digit local dialing. (i.e., multiple NPAs in a limited geographic area.)

[35] Reference State Issues Task Force

11 Industry Assignment Guidelines

11.1 Description

The Central Office Code (NXX) Assignment Guidelines (hereinafter referred to as "Guidelines"), which were reissued on July 13, 1998 (INC 95-0407), specify "guidelines for the assignment of central office codes" (i.e., CO codes or NXX codes) within geographic numbering plan areas. (Guidelines at 1.0). The Guidelines are industry consensus guidelines that "are expected to apply throughout the NANP Area subject to guidelines and constraints of the NANP Area administrations, unless the affected administrations direct otherwise." (Guidelines at 1.0). The way in which numbers are assigned to the industry directly affects the efficiency of the management and utilization of numbering resources.

While it is generally assumed that SPs attempt to conscientiously forecast, request, and utilize numbering resources, there have been several proposals of ways in which the CO Code Assignment Guidelines and other guidelines could be modified for the purpose of optimizing number utilization. Five examples of potential changes are discussed in this section:

11a. Establish fill rate and inventory level requirements (e.g., utilization thresholds) at either the NXX and/or the thousands-block levels. (No current activity is underway.)

11b. Reclaim under-utilized and un-utilized NXX codes and thousand-blocks. (No current activity is underway.)

11c. Define utilization, forecasts, and audit procedures. (Active issue at NRO-WG and NANPA Oversight WG)

11d. Standardize jeopardy procedures. (Active issue at INC)

11e. Revise number aging procedures. (Existing NANC aging document; no other current activity is underway.)

Several of these options are currently under consideration in either ATIS (INC) or NANC committees. NANC should review the status of these activities to ensure that the issues described above are being adequately addressed. If deficiencies are found, NANC may consider working the issue(s) itself, or referring it to another industry forum with appropriate guidance. Parties with specific recommendations should be encouraged to submit contributions to the forum(s) with primary responsibility for addressing the particular issue.

It is recognized that several of the other number optimization methods outlined in the NRO-WG report could require changes to the CO Code Assignment and other guidelines. This section does not address the changes to guidelines that are required to support other number optimization methods.

Below are high level descriptions of the potential areas for consideration.

11.a. Fill Rates/Utilization and Inventory Levels

Description

Fill rates pertain to the establishment of utilization levels for either NXX codes or thousands-blocks that SPs would be required to achieve before using another NXX code or thousands-block to assign numbers to customers. At present, the CO Code Assignment Guidelines state that an SP can request additional codes for growth when the existing switching entity/POI will exhaust within 12 months. Examples of potential Fill Rate/Utilization changes to the guidelines could either be in the form of reducing the 12 month interval or giving a specific percent utilization that must be achieved (e.g., 60%, 75%, 90%) prior to allowing a request for additional codes.

In anticipation of a thousands-block pooling implementation that includes the return of uncontaminated and lightly contaminated blocks, it has been proposed that SPs assign TNs in a given thousands-block to a certain level prior to assigning numbers from another thousands-block.

11.b. Reclamation

Description

This measure contemplates revising the process by which the Number Administrator reclaims codes that have not been put into service. Section 7 of the CO Code Assignment Guidelines addresses reclamation.

One possible modification would be to include specific time frames within Section 7.1 which addresses the process for carriers seeking an extension, e.g., limit the extension to three months with the ability to extend no more than six months.

Under the current guidelines there are conditions under which NXX codes should be reclaimed. There has been some hesitancy to reclaim codes that appear to meet these conditions. Part of this hesitancy appears to come from the changes that have occurred in the telecommunications industry since this section of the guidelines has been modified. The section on reclamation of codes should be reviewed and modified to address the current competitive status of the industry.

11c. Utilization, forecasts, and audits

Description

This measure contemplates modifying the language in the CO Code Assignment Guidelines to specify more clearly the criteria for conducting audits as well as for determining what should occur based upon the results of audits. The purpose of modifying the language is to increase accountability and enforcement. Because the Number Administrator cannot challenge an applicant's request for numbers, this measure

contemplates (1) a requirement that carriers submit more detailed supporting documentation with their request for codes and (2) the provision of information feedback loops to carriers so they can readily compare their forecast and actual use. Improving the accuracy of forecasts, providing utilization information, and ensuring compliance with the guidelines through audits could optimize utilization of the numbering resource. This could be related to the COCUS/LINUS activities.

11d. Jeopardy procedures.

Description

This measure contemplates modifying the language in the Guidelines that concern jeopardy procedures. No specific proposals have been made at this time.

11e. Aging procedures.

Definition

This measure contemplates revising the aging process. The Guidelines do not presently address aging. Therefore this measure contemplates either adding language to the Guidelines and/or states implementing language to ensure that aging guidelines adequately optimize numbering resources.

A NANPA Working Group submitted its "Final Report and Recommendation to the North American Numbering Council" on February 24, 1998, regarding the "Aging and Administration of Disconnected Telephone Numbers." The NANC has directed the INC to incorporate the recommendations into the appropriated guidelines.

Standardizing the aging processes and the aging intervals can promote the efficient management of disconnected telephone numbers.

To prevent hoarding numbers the existing aging intervals may need to be revisited at some point in the future.

12 Overlay

12.1 All Services Overlay

12.1.1 Description:

When an NPA overlay is deployed more than one NPA code serves the same geographic area. In an NPA overlay, code relief is provided by opening a new NPA code within the same geographic area as the NPA(s) requiring relief. NXXs from this new NPA will be available for assignment equally to all SPs on a "first come first served" basis (per FCC 96-333, released August 8, 1996).

Overlays, once they are implemented, end existing jeopardy. In addition, implementation of an overlay well in advance of a projected NPA exhaust (i.e., early implementation) may prevent a jeopardy situation from occurring.

This alternative addresses scarcity of existing central office codes (NXX) by opening a new NPA(s).

12.1.2 Additional Assumptions:

- The FCC has mandated 10-digit dialing for all local calls as one condition for an NPA overlay (FCC Docket No. 96-98).
- The All Services Overlay will be implemented on a non-service-specific or non-technology-specific basis.
- SPs authorized to provide telephone exchange service, exchange access, or paging service in the NPA must have access to an NXX in the exhausting NPA (but not necessarily one NXX per rate center/local calling area) prior to implementing an overlay (FCC Docket No. 96-98).
- Overlays were originally designed to address an immediate problem while providing the industry the opportunity to address long term solutions where needed.
- Since there is no experience with the implementation of other forms of NPA relief after deployment of an overlay, the deployment of any other form of NPA relief in the NPA area may not be practical after an overlay occurs.

12.1.3 Implementation Timeline:

Overlays have been implemented in some areas in the past, which may serve to model their impact in the future and thereby reduce the time required for implementation. The implementation timeline includes network and systems modifications, customer education, and permissive dialing. The respondents to the SP cost questionnaire indicated that

overlays could be implemented in 6 to 18 months. In areas where an Overlay has been implemented, the timeframe for network changes may be shorter. One respondent to the SP cost questionnaire indicated that a subsequent overlay could be implemented in 4-6 months.

12.1.4 Cost Estimation:

Similar to the implementation timeline described above, the cost of an All Services Overlay is subject to a number of variables unique to each geographic area and service provider. The ATF issued a cost questionnaire to further capture and analyze implementation cost information from End Users, Service Providers and Industry Suppliers. Aggregated results have been analyzed and can be found in Attachment 12. It has been difficult to identify an overall cost that is applicable in all areas.

12.1.4.1 Service Provider

Potential Costs associated with implementation of All Services Overlays and the 10-digit dialing required for All Services Overlays include the following components:

- Switch Translations
- Changes to announcement systems
- Directory Publishing
- OSS modifications
- Customer education and notification
- Trunking changes to accommodate 911.
- Possible Switch development to allow switches to accommodate multiple NPAs or the same NXX in multiple NPAs.
- Operator Services Switch Development to accommodate multiple NPAs.

12.1.4.2 End User of Telecommunication Services

- Customers may incur costs associated with changing such items as advertising, stationery, signage, etc.
- Reprogramming CPE, to accommodate ten-digit dialing.(faxes, auto dialers, alarm systems, modems, and other dial access equipment)
- Equipment Replacement to support 10-digit dialing.
- Update of customer databases to include 10 digit TN.

12.1.5 Benefits of Measure:

12.1.5.1 Qualitative

- This method has the advantage of allowing existing customers to keep their TNs, eliminating the need to change numbers or reprogram wireless devices.
- It makes the new numbering resource available for use throughout the entire geographic area covered by the old NPA code. Therefore, NXX codes will be available for use in the growth areas, possibly reducing the consequences associated with inaccurately forecasting growth versus non-growth areas.
- Mandatory 10-digit local dialing, which is required for overlays, could decrease customer confusion in comparison to areas that have both 7 and 10-digit local dialing.
- Subsequent overlays could be easier to implement than the first overlay in an area.
- Traditional overlays maintain the geographic significance of the existing NPA(s).
- Overlays may reduce the need for protected codes.

12.1.5.2 Quantitative

None identified at this time.

12.1.6 Technical Considerations:

12.1.6.1 Switch/OSS Development and Administration

- The Switch must be equipped for mandatory 10-digit local dialing; this may include translations work.
- Switches, including operator service switches, may require software/hardware upgrades to handle multiple NPAs and / or the same NXX in multiple NPAs
- New recorded announcements may need to be provided.
- OSS modifications may need to be made.
- Mandatory 10-digit dialing increases holding times associated with various network components. As such additional hardware and software may need to be deployed.

12.1.6.2 Network Reliability

None identified at this time

12.1.7 Impact on Competition:

12.1.7.1 Equal availability of numbers

- Timely implementation of NPA overlays, in advance of NPA jeopardy situations, ensures an uninterrupted supply of NXXs to all providers.
- This method provides equal availability of unassigned NXXs, only in the new NPA, to all industry segments.

12.1.7.2 Implementation Impacts (Out-of-area, by all, disproportionate)

12.1.7.2.1 Out of Area

- Dialing from outside of the area is not affected.
- SPs outside the area must be able to recognize the new NPA

12.1.7.2.2 If Not Uniformly Implemented by All Service Providers

- If not implemented by all service providers in a timely manner calls to subscribers assigned numbers from the new NPA may not complete.

12.1.7.2.3 Disproportionate

- An NPA overlay does not address the re-allocation of assigned NXXs in "old" NPAs. As a result, new entrants are likely to have access to fewer numbers in the old NPA than the incumbent LEC with which to compete for customers desiring numbers in the "old" NPA.
- The FCC has ordered NANPA to provide new carriers one NXX in the old NPA if they are authorized to provide service 90 day prior to the introduction of the new NPA. Some SPs feel that this order helps to address the concern above. Additionally, these SPs feel that the availability of the NXXs remaining in the existing NPA is equal for all SPs, further minimizing this concern. Other SPs feel that this does not adequately addresses competitive concerns and that they do not have equal access to the NXX resource in the existing NPA.

12.1.8 Consumer Issues:

12.1.8.1 Users/Services Impacts

- Overlays do not require existing customers to change their telephone numbers. Once implemented customer will not normally be required to change their 10 digit TNs unless the customer chooses to.
- There are additional Users/Services impacts due to dialing changes.
- Multiple NPAs associated with the same area may reduce the customer’s ability to identify an NPA with an area.

12.1.8.2 Dialing Changes

- Implementation of 10-digit mandatory dialing would have an effect on customers by requiring an additional 3-digit calls to be dialed to all home NPA whether local or long distance.
- Customer education would become especially important if the permissive dialing period were shortened.
- Consumers have objected to the additional time and inconvenience occurring when it is necessary to add 3 digits to calls previously dialed with 7 digits[36].
- Some research indicates that the young, the elderly and the memory impaired may be especially impacted by the change to 10-digit dialing. Where 911 is not in place this problem could be of particular concern.
- There may be disruption to users due to the need for reprogramming CPE, to do ten-digit dialing.(faxes, auto dialers, alarm systems, modems, and other dial access equipment).
- Changes may need to be made to stationery, advertising, signage, etc.

12.1.9 Public Safety Issues

- Some PSAP system upgrades may be required to display full 10-digit TNs.
- Where implementation of mandatory 10-digit dialing replaces a mixture of 7 and 10 digit dialing, mis-dialed calls to public safety agencies could be reduced. This benefit is limited to areas that have not implemented 911.
- In the transition from 7 to 10-digit dialing, the incidence of mis-dialed calls to public safety agencies could increase. This concern is limited to areas that have not implemented 911.
- Some Alarm and Security systems may need to be reprogrammed or replaced to dial 10-digits.

12.1.10 Other Considerations:

12.1.10.1 Regulatory/Jurisdictional Issues

The Overlay Method can be implemented in some areas now, but requires regulatory mandate and/or approval.

12.1.10.2 Conditions under Which Benefit Could be Maximized

- The overlay method is particularly appropriate in areas where the need frequent for NPA relief is anticipated.

[36] More detail on this issue is included in the State Issues Task Force section of this report.

- This measure was originally deployed to address an immediate problem while providing the industry the opportunity to address long term solutions.
- Early identification of NPA exhaust allows for the implementation of NPA overlay plans prior to the occurrence of a shortage of NXX codes and a resultant jeopardy declaration.
- Where initial overlays have been implemented, a subsequent overlay may be implemented with less time and effort.

12.2 Retroactive All Services NPA Overlay

12.2.1 Description

A Retroactive All Services Overlay represents the creation of a single area served by two or more existing NPAs when a previously established NPA boundary(ies) is eliminated. In the new NPA configuration, NXXs from all affected NPAs may be assigned to providers serving the entire overlay area. The retroactive overlay allows for a full use of all NXXs within the affected NPAs since the split line no longer exists. The use of a retroactive overlay could be supplemented by the immediate assignment of a new NPA for the area served by this option. FCC rules on 10-digit dialing in overlay areas are assumed to apply.

The retroactive overlay can be especially useful in areas where the NPAs from the previous split plan are exhausting unevenly and relief is necessary in one but not the other. Retroactive overlays have been ordered by the Public Utility Commission of Texas for deployment in the Dallas (214/972) area on December 5, 1998 and Houston (713/281) area on January 16, 1999.

Mandatory 10-digit dialing for all local calls within this type of overlay area is required consistent with FCC mandate.

12.3 Expanded NPA Overlay

12.3.1 Description

The Expanded NPA Overlay proposal would implement an overlay covering regions defined by groups of Basic Trading Areas (BTAs) or a Major Trading Area (MTA). An expanded overlay would consist of a group of counties. This proposal does not replace or change assignment boundaries for existing NPAs. This proposal permits the allocation of number resources over a potentially larger geographic region.

NXXs from this new NPA will be available for assignment equally to all carriers on a first come “first served” basis (per FCC 96-333, released August 8, 1996).

This measure also recognizes the geographic license territories for CMRS carriers adopted by the FCC from Rand-McNally demographic studies to follow the natural flow of commerce and public interest without division of municipal and county boundaries. The

relief region of the new NPA boundary can be defined by any combination of BTAs or an MTA that accommodates the numbering requirements of a region.

12.3.2 Additional Assumptions

- The FCC has mandated 10-digit dialing for all local calls as one condition for an NPA overlay (FCC Docket No. 96-98).
- The Expanded NPA Overlay would be implemented on a non-service-specific or non-technology-specific basis.
- SPs authorized to provide telephone exchange service, exchange access, or paging service in the Expanded NPA must have access to an NXX in the exhausting NPA (but not necessarily one NXX per rate center/local calling area) prior to implementing an overlay (FCC Docket No. 96-98).
- Since there is no experience with the implementation of other forms of NPA relief after deployment of an overlay, the deployment of any other form of NPA relief in the NPA area may not be practical after an overlay occurs.
- Expanded NPA Overlays may be proposed for purposes other than area code relief.
- The FCC possesses the authority to implement multi-state NPA codes.
- Overlays represent a measure to address an immediate problem while providing the industry the opportunity to address long term solutions where needed.

12.3.3 Implementation Timeline

There is uncertainty as to the timeline since Expanded NPA Overlays have not been previously implemented. The implementation timeline includes, but is not limited to, network and systems modifications, customer education, and permissive dialing. In areas where an Expanded NPA Overlay has already been implemented, the timeframe for network changes may be shorter for subsequent Expanded NPA Overlays.

12.3.4 Cost Estimation

Similar to the implementation timeline described above, the costs of Expanded NPA Overlays are subject to a number of variables unique to each geographic area and service provider. The ATF issued a cost questionnaire to further capture and analyze implementation cost information from End Users, Service Providers and Industry Suppliers. Aggregated results have been analyzed and can be found in Attachment 12. It has been difficult to identify an overall cost that is applicable in all areas.

The SP cost questionnaire asked about overlays in general. It is unclear whether respondents considered specific cost details for Expanded NPA overlays in their responses to the Overlay question. Several SPs indicated that their responses did not take into account Expanded NPA overlays.

12.3.4.1 Service Provider

Potential Costs associated with implementation of Expanded NPA Overlays and the 10-digit dialing required for Expanded NPA Overlays include the following components. Subsequent overlays may not include the cost associated with implementing 10-digit dialing:

- Switch Translations
- Changes to announcement systems
- Directory Publishing
- OSS modifications
- Customer education and notification
- Trunking changes to accommodate 911.
- Possible Switch development to allow switches to accommodate multiple NPAs or the same NXX in multiple NPAs.
- Operator Services Switch Development to accommodate multiple NPAs.

12.3.4.2 End User of Telecommunication Services

- Customers may incur cost associated with changes to advertising, stationery, signage, etc.
- Customer CPE (e.g. faxes, auto dialers, alarm systems, modems, and other dial access equipment) may need to be reprogrammed or replaced to accommodate 10 digit dialing.
- Customer databases may need to be updated to accommodate 10 digit dialing.

12.3.5 Benefits of Measure

12.3.5.1 Qualitative

- This method has the advantage of allowing existing customers to keep their numbers which alleviates the need to change advertising or reprogram wireless devices.
- The measure makes the new numbering resource available for use throughout the geographic area covered by the expanded NPA area. Therefore, NXX codes will be available for use in growth areas, possibly reducing the consequences associated with inaccurate growth forecasts.
- The mandatory 10-digit local dialing which is required for overlays, could decrease customer confusion in areas that have simultaneous 7 and 10 digit local dialing patterns.
- Subsequent overlays could be easier to implement than the first overlay in an area.

- Expanded NPA Overlays may reduce the need for protected codes.

12.3.5.2 Quantitative

None identified at this time.

12.3.6 Technical Considerations

12.3.6.1 Switch/OSS Development and Administration

- The Switch must be equipped for mandatory 10 digit local dialing; this may include translations work.
- Switches, including operator service switches, may require software/hardware upgrades to handle multiple NPAs and / or the same NXX in multiple NPAs
- New announcements may need to be provided.
- OSS modifications may need to be made.
- Mandatory 10-digit dialing increases holding times associated with various network components. As such additional hardware and software may need to be deployed.
- Since Expanded NPA overlay boundaries may split rate centers, switches and OSS (TN Admin) may need to modified to accommodate this.
- Multiple NXXs may need to be acquired to serve split rate centers.
- Where an expanded NPA Overlay would split existing rate centers, the current structure of LNP would need to be reviewed.
- Expanded overlays may require OSS administration for geographic regions larger than the existing NPA boundary.

12.3.6.2 Network Reliability

None identified at this time.

12.3.7 Impact on Competition

12.3.7.1 Equal Availability of Numbers

- Timely implementation of NPA overlays, in advance of NPA jeopardy situations, ensures an uninterrupted supply of NXXs to all providers.
- This method provides equal availability of unassigned NXXs only in the new NPA to all industry segments.

12.3.7.2 Implementation Impacts (Out-of-area, by all, disproportionate)

12.3.7.2.1 Out of Area

- Dialing from outside the area is not affected.

- SPs outside of area must be able to recognize the new NPA.
- Carrier restrictions on completing calls to an NXX within the NPA that lies outside the selected carrier's regulated service area may require CPE and local routing table updates to query six rather than three digits.

12.3.7.2.2 If Not Uniformly Implemented by All Service Providers

- If not implemented by all service providers in a timely manner calls to subscribers assigned numbers out of the new NPA may not complete.
- The use of NXXs from an Expanded NPA overlay may be voluntary because of the differing nature of the proposal.

12.3.7.2.3 Disproportionate

The following apply if this option is used for Area Code Relief:

- An NPA overlay does not address the re-allocation of assigned NXXs in "old" NPAs. As a result, new entrants are likely to have access to fewer numbers in the old NPA than the incumbent LEC. In areas where the old NPA is well known, or customers express a preference for the old NPA, this is considered by new SPs to be a competitive disadvantage.
- The FCC has ordered that new carriers are guaranteed one NXX in the old NPA if they are authorized to provide service 90 day prior to the introduction of the new NPA. Some SPs feel that this order helps to addresses the concern above. Additionally, these SPs feel that the availability of the NXXs remaining in the existing NPA are equally available to all SPs further minimizing this concern. Other SPs feel that this does not adequately addresses competitive concerns and that they do not have equal access to the NXX resources in the existing NPA.

12.3.8 Consumer Issues

12.3.8.1 User/Services Impacts

- This alternative requires customers to dial 10 digits for local calls, which will require significant customer education (e.g., would require new sensitivity to the area code). Customer education would become especially important if the permissive dialing period is shortened. Since the industry is currently only required to provide this education to customers in the affected area, some additional effort may be required for notification outside the area.
- CPE changes, including possible upgrade or replacement of some CPE, may be required to accommodate the 10-digit dialing requirement.
- Depending upon the geographic area covered by the expanded NPA, and the applicable rating rules, end users may encounter toll charges for calls to the same NPA or other NPAs that cover the same geographic area.

- Because expanded NPAs may cover a much larger geographic area than traditional NPAs, they may not have a geographic connotation for callers within and outside the expanded NPA.
- End users placing toll calls to the expanded NPA area may be confused when toll statements show calls to unfamiliar geographic areas.
- Mandatory customer number changes within the affected overlay relief area are eliminated.
- Expanded NPA overlays do not require existing customers to change their telephone numbers.

12.3.8.2 Dialing Changes

- Implementation of 10-digit mandatory dialing would impact customers by requiring an additional 3 digits to be dialed to all home NPA local calls.
- Customer education would become especially important if the permissive dialing period were shortened.
- Some consumers have objected to the additional time and inconvenience which results from the need to add 3 digits to calls previously dialed with 7 digits
- Some research indicates that the young, the elderly and the memory impaired may be especially impacted by the change to 10-digit dialing. Where 911 is not in place, this problem could be of particular concern.
- There may be disruption to users due to the need for reprogramming CPE, to do ten-digit dialing.(faxes, auto dialers, alarm systems, modems, and other dial access equipment).
- Public Safety Issues
- Some PSAP system upgrades may be required to display full 10-digit TNs.
- Where implementation of mandatory 10-digit dialing replaces a mixture of 7 and 10 digit dialing, mis-dialed calls to public safety agencies could be reduced. This benefit is limited to areas that have not implemented 911.
- In the transition from 7 to 10-digit dialing, the incidence of mis-dialed calls to public safety agencies could increase. This concern is limited to areas that have not implemented 911.
- Some Alarm and Security systems may need to be reprogrammed or replaced to dial 10-digits.

12.3.9 Other Considerations

12.3.9.1 Regulatory and/or Jurisdictional Considerations

If expanded NPAs cross interstate boundaries, additional coordination within NANPA CO Code Administration, SPs and regulatory agencies would be required.

12.3.9.2 Conditions under Which Benefit could be Maximized

- The overlay method is particularly appropriate in areas where the need frequent for NPA relief is anticipated.
- Early identification of NPA exhaust allows for the implementation of NPA overlay plans prior to an NXX shortage or Jeopardy situation.
- Where initial overlays have been implemented a subsequent overlay may be implemented with less time and effort.

12.4 Specialized Overlay

12.4.1 Description

Non LNP-capable SPs could utilize specialized overlay. Specialized overlay couold be used for mobile services, or it could be used to achieve specific rate treatment. A specialized overlay is defined over a geographic footprint corresponding to one or more geographic NPAs, Major Trading Areas (MTAs), Metropolitan Statistical Areas (MSAs), or other geographic convention, but is used to assign numbers to SPs who satisfy, or who fail to satisfy, certain specific eligibility criteria for use of "traditional" geographic NPA numbering resources. SPs who are unable to meet or are exempt from meeting certain requirements for assignment of numbers in an underlying geographic NPA or who participate in the option arrangement selected, via any applicable number optimization measure, could be required to accept numbers in (and to change pre-existing numbers to) a Specialized Overlay NPA. SPs who are unable or unwilling to participate in the another resource optimization arrangement that is adopted for the underlying geographic NPA would not be able to retain or obtain numbers in that NPA.

A "mobile services overlay" is one form of specialized overlay under which services that are not characterized by a fixed geographic location (e.g., cellular and PCS phones, pagers) are assigned to an area code other than that used for fixed wireline or wireless (e.g., a wireless local loop) services.

Another type of specialized overlay may be used to distinguish specific rating treatment for specialized services such as Calling Party Pays, Extended Local Calling Areas and two-way Extended Area Service.

12.4.2 Additional Assumptions:

- It will be necessary to change FCC mandate and/or federal law in order to allow implementation of mobile-specific overlays, and other specialized overlays.

- Specialized Overlays could apply to service providers that cannot participate in the number resource optimization measure being applied in the area where they provide service. Limitations which apply to other optimization measures (e.g. LRN biased measures) would not apply to Specialized Overlays.
- This measure should only be considered where competition for customers does not exist between service providers in the traditional NPA and the service providers in the specialized Overlay
- Customers of service providers being moved to a specialized overlay must undergo a telephone number change.

12.4.3 Implementation Timeline:

- The SP cost questionnaire included questions about overlays in general, but it is unclear if respondents considered specific implementation details for Specialized NPA overlays in their responses to the Overlay question. Several SPs indicated that their responses did not take into account Specialized NPA overlays.
- The timeframe for specialized overlay implementation varies according to the type of specialized overlay being applied. If only new service providers were served by the specialized overlay, the overlay could be implemented in approximately the same time as a traditional overlay. On the other hand, if existing customers were moved to a specialized overlay, a much lengthier implementation period would be required.

12.4.4 Cost Estimation

Similar to the implementation timeline described above, the costs of Specialized Overlays are subject to a number of variables unique to each geographic area and service provider. The Analysis Task Force issued a cost questionnaire to further capture and analyze implementation cost information from End Users, Service Providers and Industry Suppliers. Aggregated results have been analyzed and can be found in the Attachment. It has been difficult to identify an overall cost that is applicable in all areas.

12.4.4.1 Service Providers

The SP cost questionnaire asked about overlays in general and it is unclear if respondents considered specific cost details for Specialized NPA overlays in their responses to the Overlay question. Several SPs indicated that their responses did not take Specialized NPA overlays into account.

- The cost of implementing a specialized overlay depends upon the type of overlay being implemented. In some cases, the cost should be roughly equivalent to a traditional overlay. However, if end user telephone numbers are moved to the specialized overlay, there will be significant costs incurred in changing these telephone numbers.

- Only those carriers served by specialized overlays will be required to pay for customer education associated with their introduction. Thus, while all carriers would benefit from specialized overlay implementation, only some carriers would pay for customer education.

12.4.4.2 End Users

- While wireless end users are not generally expected to pay for the cost of reprogramming wireless devices moved to a specialized overlay, there could be impacts to these end users associated with the time and effort necessary to have their wireless devices reprogrammed. In some types of specialized overlays there would be little or no end user cost.
- As with any code relief or conservation methodology that causes end users to change TNs, there are end user costs involved for all parties. These changes may include changes to promotional material, speed dialers, and other items.

12.4.5 Benefits of Measure

- Specialized overlays will increase the number of available NXXs in the traditional NPA via return of NXXs which service providers return as they move to the specialized overlay.

Assuming that specialized overlays can be expeditiously implemented, and that sufficient NXXs are returned, they provide a way for customers of one market segment (i.e. customers of fixed services) to avoid a telephone number change and other area code relief related impacts, at the expense of customers in another market segment. This is a benefit if number changes impose less impact on customers of one market segment than another.

- If NXXs in a specialized overlay are utilized for rating purposes, CPE modifications and other changes could be avoided.
- The Specialized Overlay solution would impact carriers who satisfied the criteria established for inclusion in the specialized overlay (e.g., mobile service providers or any SP unable or unwilling to participate in the number resource optimization measure(s) adopted for the underlying NPA). It could also make available NXX codes in the underlying NPA, thereby extending its life and making additional codes available for assignment to newer carriers, thereby assuring increased competitive parity as among carriers who compete most directly with one another areas that have not implemented 911.
- In the transition from 7 to 10 digit dialing, the incidence of mis-dialed calls to public safety agencies could increase. This concern is limited to areas that have not implemented 911.

- In the transition from 7 to 10-digit dialing, the incidence of mis-dialed calls to public safety agencies could increase. This concern is limited to areas that have not implemented 911.
- Some alarm and security systems may need to be programmed or replaced 10-digits.9
- The implementation of specialized overlays could alleviate the need for new NPAs. With a mobile services overlay, customers of fixed services could avoid the cost of changing their telephone number or dialing pattern, when dialing other wireline end users.

12.4.6 Additional Assumptions

- The FCC has mandated 10-digit dialing for all local calls as one condition for an NPA overlay (FCC Docket No. 96-98).
- The Expanded NPA Overlay would be implemented on a non-service-specific or non-technology-specific basis.
- SPs authorized to provide telephone exchange service, exchange access, or paging service in the Expanded NPA must have access to an NXX in the exhausting NPA (but not necessarily one NXX per rate center/local calling area) prior to implementing an overlay (FCC Docket No. 96-98).
- Since there is no experience with the implementation of other forms of NPA relief after deployment of an overlay, the deployment of any other form of NPA relief in the NPA area may not be practical after an overlay occurs.
- Expanded NPA Overlays may be proposed for purposes other than area code relief.
- The FCC possesses the authority to implement multi-state NPA codes.
- Overlays represent a measure to address an immediate problem while providing the industry the opportunity to address long term solutions where needed.

12.4.7 Implementation Timeline

There is uncertainty as to the timeline since Expanded NPA Overlays have not been previously implemented. The implementation timeline includes, but is not limited to, network and systems modifications, customer education, and permissive dialing. In areas where an Expanded NPA Overlay has already been implemented, the timeframe for network changes may be shorter for subsequent Expanded NPA Overlays.

12.4.8 Cost Estimation

Similar to the implementation timeline described above, the costs of Expanded NPA Overlays are subject to a number of variables unique to each geographic area and service provider. The ATF issued a cost questionnaire to further capture and analyze

implementation cost information from End Users, Service Providers and Industry Suppliers. Aggregated results have been analyzed and can be found in Attachment 12. It has been difficult to identify an overall cost that is applicable in all areas.

The SP cost questionnaire asked about overlays in general. It is unclear whether respondents considered specific cost details for Expanded NPA overlays in their responses to the Overlay question. Several SPs indicated that their responses did not take into account Expanded NPA overlays.

12.4.8.1 Service Provider

Potential Costs associated with implementation of Expanded NPA Overlays and the 10-digit dialing required for Expanded NPA Overlays include the following components. Subsequent overlays may not include the cost associated with implementing 10-digit dialing:

- Switch Translations
- Changes to announcement systems
- Directory Publishing
- OSS modifications
- Customer education and notification
- Trunking changes to accommodate 911.
- Possible Switch development to allow switches to accommodate multiple NPAs or the same NXX in multiple NPAs.
- Operator Services Switch Development to accommodate multiple NPAs.

12.4.8.2 End User of Telecommunication Services

- Customers may incur cost associated with changes to advertising, stationery, signage, etc.
- Customer CPE (e.g. faxes, auto dialers, alarm systems, modems, and other dial access equipment) may need to be reprogrammed or replaced to accommodate 10 digit dialing.
- Customer databases may need to be updated to accommodate 10 digit dialing.

12.4.9 Benefits of Measure

12.4.9.1 Qualitative

- This method has the advantage of allowing existing customers to keep their numbers which alleviates the need to change advertising or reprogram wireless devices.

- The measure makes the new numbering resource available for use throughout the geographic area covered by the expanded NPA area. Therefore, NXX codes will be available for use in growth areas, possibly reducing the consequences associated with inaccurate growth forecasts.
- The mandatory 10-digit local dialing which is required for overlays, could decrease customer confusion in areas that have simultaneous 7 and 10 digit local dialing patterns.
- Subsequent overlays could be easier to implement than the first overlay in an area.
- Expanded NPA Overlays may reduce the need for protected codes.

12.4.9.2 Quantitative

None identified at this time.

12.4.10 Technical Considerations

12.4.10.1 Switch/OSS Development and Administration

- The Switch must be equipped for mandatory 10 digit local dialing; this may include translations work.
- Switches, including operator service switches, may require software/hardware upgrades to handle multiple NPAs and / or the same NXX in multiple NPAs
- New announcements may need to be provided.
- OSS modifications may need to be made.
- Mandatory 10-digit dialing increases holding times associated with various network components. As such additional hardware and software may need to be deployed.
- Since Expanded NPA overlay boundaries may split rate centers, switches and OSS (TN Admin) may need to modified to accommodate this.
- Multiple NXXs may need to be acquired to serve split rate centers.
- Where an expanded NPA Overlay would split existing rate centers, the current structure of LNP would need to be reviewed.
- Expanded overlays may require OSS administration for geographic regions larger than the existing NPA boundary.

12.4.11 Technical Considerations

Wireless handsets can sometimes be reprogrammed with new telephone numbers remotely, with the assistance of a wireless service representative, or, rarely, by the end user via keypad entries. Those that cannot be reprogrammed remotely would require on-site service. Where there have been geographic splits, some wireless providers have

distributed area code reprogramming fact sheets so that end users can reprogram their own phones for speed dialing purposes without the assistance of service representatives.

12.5 Impact on Competition

12.5.1 Equal Availability of Numbers

The FCC's rationale for its original prohibition on wireless overlays was based on the opinion that it would competitively disadvantage wireless carriers who compete with wireline carriers. The Proposed 708 Relief Plan and 630 Numbering Plan Area Code by Ameritech-Illinois; 10 FCC Rcd 4596 (1995); Implementation of the Local Competition Provisions of theTelecommunications Act of 1996, 11 FCC Rcd 19392 (1996). Some believe, however that there is not any material competition between mobile services and fixed services carriers. In other words, customers do not substitute one service for the other. These task force members also believe that such competition is not likely to materialize in the near future.

12.6 Implementation Impacts (out-of-area, by all, disproportionate)

12.6.1 Disproportionate

Some entities believe that with a traditional all services overlay, incumbent wireless carriers and incumbent wireline carriers have disproportionate access to the existing NPA. In the case of a mobile services overlay, where mobile service carriers, during a reasonable transition period, would be required to transfer their numbers to the overlay NPA, the consequence would put new and incumbent mobile carriers into a condition of competitive parity with respect to TNs, with both using the new NPA. Also, the implementation of a mobile overlay would make available NXX codes in the existing NPA. This has the potential to reduce the disproportunate access to exsint NPA resources for incumbent versus new fixed services SP. However, this increases the disproportunate access to existing NPA resources between two potentially competing market segments, i.e. wireless and wireline. .

A study[37] by one SP found that competion curretnly exists between wireless and wireline providers. Thus, some SPs believe that specialized overalys could forstall or substantially reduce inter-modal competition.

Some entities believe that the FCC continues to rule against service or technology-specific overlays because these overlays constitute lack of technological neutrality and, could potentially forestall or substantially reduce true and equitable inter-modal competition.

[37] A recent BellSouth study suggested that 12 to 14% of subscribers selected PCS instead of wireline service for their primary form of telecommunications and that some 37% of business users use PCS, not wireline, as their primary telecommunications line.

Many parties, some states, and the FCC have concluded that technology or service specific overlays are anti-competitive and discriminatory against the SPs moved into the new overlay NPA.

If specialized overlyas are used for rating purposes, education outside specialized overlay areas is desirable.

12.7 Consumer Issues

12.7.1 Users/Services Impacts/Dialing Changes

Customers of mobile services would need to reprogram their mobile telephone sets. See section above, "Technical Considerations."

12.8 Public Safety Issues

- Some 911 databases have a limit on the number of NPAs that can be accommodated.
- 911 databases need to be converted for numbers affected by new NPA.
- Alarm systems: Some systems may need to be reprogrammed to dial 10-digits if the associated monitoring system is located in the new NPA.

12.9 Other Considerations

12.9.1 Jurisdictional

The implementation of specialized overlays could not proceed until all regulatory and legal obstacles to their introduction have been exhaused.

Customers' perception of a specialized overlay NPA being associated with a particular service type will be compromised with the introduction of number portability. For example, when customers are allowed to retain a TN within the specialized overlay NPA, e.g., wireless, for another type of service, e.g., wireline.

Likewise, when a customer ports from an SP using the specialized overlay to an SP using the existing NPA, the TN from the specialized overlay must be routed, rated and otherwise treated as a TN from the existing NPA, and vice versa. If calls to the ported TN require a different billing treatment, e.g., "calling party pays," customer confusion may result and users may be adversely affected.

12.9.2 Conditions Under Which Benefits Could Be Maximized

The effectiveness of this measure could be maximized by requiring all existing services satisfying the specialized overlay criteria to be moved to the specialized overlay. This could occur over a reasonable transition period, e.g., 12-24 months. If carriers that meet the criteria to be assigned numbers from the specialized overlay continue to meet the criteria for some period of time after implementation of the specialized overlay.

Competition between carriers is not expected in the specialized overlay nor the existing NPA for a significant period of time.

This measure must be preceded by the FCC removing its prohibition on service-specific or technology-specific overlays, or by modifying its rules to permit the use of specialized overlays where the net effect upon competition would be positive or minimally negative, and/or where the number resource optimization gain would be substantial. To the extent that existing FCC rules may not prohibit the use of specialized overlays under certain conditions (e.g., where SPs who elect not to participate in a particular number resource optimization solution, or who claim a technological impediment to such participation, would be required to shift to an overlay NPA in which that solution would not have been implemented), state commissions may consider such solutions in future area code relief proceedings. However, many parties and Section 332 of the code of federal regulations generally prohibits states from exerting jurisdiction over wireless providers. Also , a wireline carrier recently prevailed in an action where previously assigned telephone numbers were revoked by a number administrator. Even if the FCC removed its prohibition against service specific overlays and state jurisdiciton over wireless, civil litigation should be expected. This litigation would likely be widespread and would in all probability require many months or years to resolve.

13 Reduce Demand for TNs

There was no specific proposal supplied that could be analyzed for this report. As a result, the ATF has no analysis or recommendation for this optimization method.

14 Geographic Split

14.1 Description

A geographic split occurs when the existing NPA area is divided into two or more contiguous geographic areas that will each be assigned its own area code. The split lines are drawn based on multiple considerations, including balancing of NPA lives between the new areas, and grouping along communities of interest or jurisdictional, natural, or physical boundaries (counties, boroughs, cities, rivers, etc.). One of the areas will maintain the original area code, while the other area(s) will receive new NPA(s). This will require a portion of the subscribers to change NPAs. NXXs from both NPA(s) will be available for assignment equally to all carriers on a first come, first served, basis (per FCC 96-333, released August 8, 1996).

Geographic splits, once they are implemented, will end existing jeopardy situations. In addition, implementation of a geographic split well in advance of a projected NPA exhaust (i.e., early implementation) may prevent a jeopardy situation from occurring.

This alternative addresses scarcity of existing central office codes (NXX) by opening new NPAs.

14.2 Additional Assumptions

The area under consideration for an NPA split meets the criteria in the INC guidelines for NPA relief. These criteria include, but are not limited to:

- a split drawn along existing rate center boundary lines and in such a way that the life span of the new NPA areas should be approximately equal.
- It is a measure to address an immediate problem while providing the industry the opportunity to address long term solutions where needed.

14.3 Implementation Timeline

Geographic splits have been implemented throughout the country for decades. Thus there is a considerable model of experience from which to determine the most appropriate implementation timeline in a given situation.

The implementation timeline includes network and systems modifications, customer education, permissive dialing, and intercept announcements.

The respondents to the SP cost questionnaire indicated that a split takes from 12 to18 months to implement.

Industry experience has shown that these timelines can be reduced under extreme conditions.

14.4 Cost Estimation

Similar to the implementation timeline described above, the costs of NPA Splits are subject to a number of variables unique to each geographic area and service provider. The ATF issued a cost questionnaire to further capture and analyze implementation cost information from End Users, Service Providers and Industry Suppliers. Aggregated results have been analyzed and can be found in Attachment XX. It has been difficult to identify an overall cost that is applicable in all areas.

14.4.1 Service Providers

- Customer education and notification
- Network and System Modifications
- Directory Changes
- Tariff Revisions
- Reprogramming of Cellular Handsets

14.4.2 End User of Telecommunication Services

- Customers in new NPA may incur costs associated with changing such items as advertising, stationery, signage, etc.
- Certain customer CPE may need to be reprogrammed to accommodate the new NPA(s) (e.g. faxes, auto dialers, alarm systems, modems, and other dial access equipment)
- Cellular handsets may need to be reprogrammed.
- End Users may incur Directory Assistance and other costs to locate a party whose NPA has changed.

14.5 Benefits of Measure

14.5.1 Qualitative

- Customers will be able to associate an NPA with a unique geographic area.
- Any given Customers' premises will be served by one NPA.
- Customers maintain intra-NPA 7-digit dialing.

14.5.2 Quantitative

None identified at this time

14.6 Technical Considerations

14.7 Switch/OSS Development and Administration

- Requires update of switch translation tables. All service providers must recognize the new NPA and be able to process calls. Failure to update will cause calls to fail.
- Requires update of line side number tables
- Requires update of OSS applications that reference a TN in the effected area.
- Requires update of TRA Products.

14.8 Network Reliability

If customer education and permissive dialing periods are not sufficient, switch congestion may result.

14.9 Impact on Competition

14.9.1 Equal availability of numbers

- This method provides equal availability of unassigned NXXs in both the new and the old NPA to all industry segments.
- Timely implementation of geographic splits, in advance of NPA jeopardy situations, ensures an uninterrupted supply of NXXs to all providers.

14.10 Implementation Impacts

14.10.1 Out of area

If SPs outside the affected area do not activate the new NPA, particularly before the end of the permissive period, calls may fail.

14.10.1.1 By All Service Providers

If not implemented by all service providers in a timely manner, calls to subscribers assigned numbers in the new NPA may not complete.

14.10.1.2 Disproportionate

- If wireless SPs are not allowed to retain their NPA-NXXs in an NPA split, wireless SPs and their customers will encounter a significant cost, in time and money, to reprogram wireless handsets.
- If wireless SPs are permitted to retain their NPA-NXXs in an NPA split, and wireline SPs are not allowed to do so, there would be a disproportional impact on wireline SPs and their customers.

- Relative to number optimization methods, some end users feel that geographic splits impose costs predominantly on subscribers.
- Some SPs feel that since customers have to change NPAs they may be have an incentive to consider changing SPs in an NPA split. This is viewed as a disproportionate impact on incumbent carriers.

14.11 Consumer Issues

14.11.1 Users/Services Impacts

- Some end users will incur significant costs associated with a change in their NPA. Approximately half of the customers will not be affected by a number change. There will need to be for new business stationery, signage, customer notification etc., normally associated with a number change. The other approximately one-half of the customers will be required to make these changes.
- If the permissive dialing period (including informative announcements) is too short customer confusion may result.
- Many successive splits may reduce a customer's ability to identify an NPA with a particular area.
- Telecommunication equipment may need to be reprogrammed for those customers who are receiving the new NPA and for equipment that dials into the new NPA.

14.11.1.1 Dialing Changes

There will be a potential increase in 10 digit dialing due to the smaller area of intra-NPA territory.

14.12 Public Safety Issues

- Some 911 databases have a limit on the number of NPAs that can be accommodated.
- 911 databases need to be converted for numbers affected by new NPA.
- Alarm systems: Some systems may need to be reprogrammed or replaced to accommodate 10-digit dialing if the associated monitoring system is located in the new NPA.

14.13 Other Considerations

14.13.1 Regulatory and/or Jurisdictional Considerations

- Time frames for implementation and customer education may be mandated by regulators.

- Tariff changes are necessary to add the new NPA.
- State county and municipal boundaries should be given serious consideration when split boundaries are determined.
- Since the regulatory commissions have final authority over split boundaries, changes to split boundaries should be minimized once they are set, since changes will cause SPs and customers to incur additional cost and confusion.

14.13.1.1 Conditions under Which Benefits could be Maximized

- Early identification of NPA exhaust allows for the implementation of NPA relief plans prior to the occurrence of a shortage of NXX codes and the declaration of jeopardy.
- The benefits of this measure are maximized if the old and new NPAs have similar lifespans.
- Splits are less disruptive if they can be accomplished using easily identifiable jurisdictional, natural, or physical boundaries (counties, boroughs, cities, rivers, etc.).
- The numbering resources are better utilized if the split boundaries do not divide rate centers.
- Splits are more appropriate in large geographic areas.
- Benefits are maximized if the likelihood of the need for additional NPA relief in the near term is low.

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Attachments

The following documents from other industry groups have been provided as reference documents for information purposes. The ATF has not reviewed these documents and does not endorse their contents; inclusion of these documents does not imply consensus, or lack thereof, by the ATF or NRO-WG.

REPLACE THIS PAGE WITH:

ATTACHMENT: 3-1

TITLE: Industry Numbering Committee (INC), Initial Report to the North American Numbering Committee (NANC) on Number Pooling, INC97-1017-019 (January 1998)

REPLACE THIS PAGE WITH:

ATTACHMENT: 3-2

TITLE: Industry Numbering Committee (INC), Thousand Block Pooling Assignment Guidelines, Draft 10

REPLACE THIS PAGE WITH:

ATTACHMENT: 3-3

TITLE: Colorado Number Pooling Report

REPLACE THIS PAGE WITH:

ATTACHMENT: 3-4

TITLE: "Illinois Report on Number Pooling "

Illinois Number Portability Workshop, Number Pooling Subcommittee, Report on Number Pooling, September 2, 1997

REPLACE THIS PAGE WITH:

ATTACHMENT: 3-4a

TITLE: Illinois Report on Number Pooling Trial – Interim Report August 21, 1998

REPLACE THIS PAGE WITH:

ATTACHMENT: 3-5

TITLE: New York Interim Thousand Block Number Pooling

PAGE LENGTH: 1

REPLACE THIS PAGE WITH:

ATTACHMENT: 3-6

TITLE: T1S1.6 Letter

PAGE LENGTH: 2

REPLACE THIS PAGE WITH:

ATTACHMENT: 3-7

TITLE: ATF Cost Questionnaire overview

PAGE LENGTH: 2

REPLACE THIS PAGE WITH:

ATTACHMENT: 3-8

TITLE: Industry Supplier Letter

PAGE LENGTH: 8

REPLACE THIS PAGE WITH:

ATTACHMENT: 3-9

TITLE: End User Letter

REPLACE THIS PAGE WITH:

ATTACHMENT: 3-10

TITLE: End User Questionnaire

PAGE LENGTH: Excel Spreadsheet

REPLACE THIS PAGE WITH:

ATTACHMENT: 3-11

TITLE: Service Provider Letter

PAGE LENGTH: 4

REPLACE THIS PAGE WITH:

ATTACHMENT: 3-12

TITLE: Service Provider Questionnaire Thousands-Block

PAGE LENGTH: Excel Spreadsheet

REPLACE THIS PAGE WITH:

ATTACHMENT: 3-13

TITLE: Service Provider Questionnaire ITN

PAGE LENGTH: Excel Spreadsheet

INSERT THE FOLLOWING ATF QUESTIONNAIRES

TITLES: End User Questionnaire.xls
End User Questionnaire pt. 2.xls
Service Provider Questionnaire – 10-Digit Dialing.xls
Service Provider Questionnaire – ELCA.xls
Service Provider Questionnaire – Geographic Splits.xls
Service Provider Questionnaire – Inconsistent Rate Centers.xls
Service Provider Questionnaire – Location Portability.xls
Service Provider Questionnaire – Modify CO Codes.xls
Service Provider Questionnaire – NXX-X Code Sharing
Service Provider Questionnaire – Overlay NPA.xls
Service Provider Questionnaire – Reduce Demand for Numbering Resources.xls
Service Provider Questionnaire – Route Indexing.xls
Service Provider Questionnaire – Traditional Rate Center Consolidation.xls
Service Provider Questionnaire – Existing Rate Center Consolidation.xls
Service Provider Questionnaire – Unassigned Number Pooling.xls

Excel Spreadsheets

15 State Issues Task Force Section

15.1 Introduction

The State Issues Task Force (SITF) is charged with providing specific information to the Number Resource Optimization Working Group (NRO-WG) primarily on the needs of the states in the area of number resource optimization. The SITF is comprised of members of industry and state regulatory commissions. The SITF was given two major tasks by the NRO-WG to complete for this report. The first task was to survey the various state regulatory commissions and get individual state feedback on the NRO-WG's numbering resource optimization measures. The second task was to design a model data request for use by the state commissions in their efforts to obtain number utilization data from SPs for use in forecasting NPA exhaust and/or selection of or number resource optimization measures. This report is the culmination of the SITF effort on those two tasks.

Although numerous states are represented on the SITF, it was felt that the SITF should seek an even broader viewpoint when gathering data on the measures designated by the NRO-WG. For this reason, the SITF drafted a survey (below) that was sent to commissions in each of the fifty states and Washington, DC. The surveys were sent to the Chair of each Commission and the Staff person with numbering responsibilities. The National Association of Regulatory Utility Commissions (NARUC) assisted in distributing the survey and creating awareness of its importance. Thirty-six responses were received. The responses received represent a wealth of information on state opinion, action taken and planned, as well as regulatory and technical needs; although, continued work efforts may have taken place since the survey was conducted which may modify these responses. It is expected that the NRO-WG, NANC, and the FCC will use this information in formulating future plans in the area of number resource optimization.

This section summarizes the survey responses and highlights state commission input on the fourteen measures outlined by the NRO-WG. The survey has three parts. The first part required simple yes or no answers to questions aimed at gauging, for instance, commission knowledge level of and interest in a particular measure. The goal of the second part was to gather state commission recommendations on certain numbering issues through the use of essay type questions. The third part of the data request enabled commissions to include any type of additional information relevant to numbering resources. State commission orders and state task force reports are examples of what was provided in response to the third part of the survey. The SITF did not feel its responsibility included detailed analysis of the aggregate response to the survey. While some high level analysis is included in this report, much of the information gathered was reported in such a way that it is not conducive to detailed analysis. For example, thousands-block number pooling rates a high interest level in the survey compilation. However, we are uncertain what conclusion may be reached from a high interest level. It may be due to a state actually planning or implementing thousand block pooling or, conversely, a state simply wanting to know more about pooling as a tool to conserve numbering resources.

With the frequency of NPA exhaust increasing, state commission interest has grown in the efficient telephone number utilization by SPs. To this end, a number of states have developed data requests to get the appropriate information from SPs. States have met with varying degrees of success in generating the information they were seeking. Part of the reason for the inconsistent levels of success may lie in the design of the data request itself. Carriers may have a presence in different states, so that the responsibilities of the people handling their number resources may be either regional or national. The person to whom the data request is directed may receive a multitude of data requests, each asking for essentially the same information, and each looking for data in a unique format. A goal of the SITF is to develop a standard data request for number utilization that can be used by the different commissions. The SITF seeks to take into account the needs of both the commissions and SPs in designing the data request. Having a proposed standardized format will enable states to spend less time developing unique data requests, and will enable SPs to reply to the data requests in a standard format, allowing their responses to be more accurate and timely.

The SITF believes the response rate and the actual responses to its data request indicate the intense interest of State Commissions in numbering resource optimization and the efforts of the NRO-WG. It seems clear that State Commissions feel the work of the NRO-WG is important to them and the consumers they represent. The SITF hopes the NRO-WG, NANC, FCC, State Commissions, and others interested in numbering resource optimization can benefit from its work on the survey and data request. The SITF hopes both are bridges to a better understanding of number resource conservation at all levels of industry and government.

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15.2 Survey Matrix Response Aggregation

Measures That Affect Local Calling	Are You Familiar with?				Do You Favor Implementation Of? (Yes or No)				Do you plan to/have you implement(ed) (Yes or No) If yes when?				Rank (High, Medium, Low) your Interest In…				Have You collected data/info regarding…. (Yes or No) If yes, how and what type, (Commission, staff, date request, etc.)			
	Y	N	?	NA	Y	N	?	NA	Y	N	?	NA	H	M	L	NA	Y	N	?	NA
Rate Center Consolidation	31	4		1	17	3	11	6	7	20	2	8	9	16	5	7	8	23		6
Extended Local Calling Areas/Wide Area Calling Plans	35			2	22	3	8	3	24	9		3	11	12	7	6	11	18		6
Geographic Number Portability	34	1		2	23	4	5	5	4	25		7	11	8	12	5	4	25		7
Inconsistent Rate Centers	18	18		1	5	7	8	16	2	17	2	15	3	5	14	14	2	23		11
Eliminate Protected Codes	29	6	1	1	12	8	7	9	7	19	1	9	6	10	13	7	4	24		8
Individual Telephone Number Pooling	26	10		1	8	3	8	12		20	3	13	7	11	6	12	4	24		8
1000 Block Number Pooling	29	6		1	22		5	8	6	15	5	9	19	4	3	8	12	17		7
Unassigned Number Porting	20	16		2	10	2	8	17		15	4	18	7	6	8	16	5	18		13
NXX Code Sharing	23	13		1	15	2	5	13	7	12	2	15	7	8	7	13	4	20		12
Wireless/wireline																				

1 carrier/multiple rate centers																				
Paper pooling																				
CO Code assignment guideline related measures:																				
Audits/increased compliance	26	9		2	16	4	5	11	3	13	5	12	12	6	8	10	8	16	1	10
More Stringent requirements	24	11		2	16	5	3	12	4	14	4	10	15	4	8	10	5	18	1	12
Enforce fill rate requirements	25	10		2	17	4	3	12	5	16	3	12	14	4	7	11	6	17	1	12
Reduce Potential for Geographic NPA Exhaust	21	11	1	1	18	2	2	11	7	8	2	16	14	3	2	13	5	15	1	13
Reduce Demand for Individual TNs	20	15		3	14	5	4	13	1	20		15	8	7	8	12	2	21		13
Route Indexing	14	22		2	8	4	4	21	3	13	1	20	2	10	5	19		18	1	17

Y = Yes N = No ? = Undecided/Unsure NA = Not Applicable/No Response Provide

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15.2.1 Keys to the Matrix

Most states responded either yes or no to the questions on the data request. Some states were undecided or the information requested was not applicable. In instance where the response was undecided, it was indicated that the Commission had not yet ruled or was in the process of considering the issues. For this reason, the SITF felt it necessary to create a new category identified by a question mark ("?"). Ranking of the measures as high, medium, or low interest is subjective. For example, a "high" interest response might indicate a state's interest in knowing more about a particular measure, a state being in the process of implementing that measure, or a state that has implemented that measure and considers it an important tool.

15.3 Summary of Essay Question Responses

Following is a summary of the second portion of the survey. Not all states responded to all questions. Due to the nature of responses, some interpretation of the responses was required for the summary. The use of the words majority and minority in this section relate to the number of answers received.

Which form of area code relief do you prefer and why? (geographic splits, geographic overlays/all-services overlay, or service-specific overlays, other)

Of the states providing responses to this question, the majority prefer geographic splits for a number of reasons. The prime factor for the geographic split preference was the ability to keep 7-digit dialing. Other reasons included: identification of an area with a number; competitive neutrality among service providers; lower cost; less end user disruption; and better number resource utilization. While certain states favored and employed geographic splits, states are quite sensitive to the expense and inconvenience of such activity borne by consumers.

Of those states with a preference for all-services overlays, the most frequently cited reason was the avoidance of end user number changes. Other reasons included: less disruption to consumers; better number conservation; and less costly to implement. Among the states preferring overlays, the FCC's mandatory 10-digit dialing was cited as the primary disadvantage.

Of the two states preferring service specific overlays, one cited customer preference based on the results of a customer survey. The other state indicated that service specific overlays should be utilized because specific consumer recognizable geographic boundaries are available.

A few states commented that the form of relief should be determined on a case-by-case basis, with some states observing that the viability of either a geographic split or all-services overlay should depend on the area in which relief is to be implemented. For a couple of these states, overlays were considered useful in small, high growth areas, while geographic splits were more useful in larger geographic areas with slower growth. One

state ordered an all-services overlay as a back-up plan pending the results of thousand block number pooling.

Do you support 7-digit dialing for calls originating and terminating in the same area code where an overlay has been implemented?

While FCC rules do not currently allow for the continuation of intraNPA 7-digit dialing following the implementation of an all-services overlay, approximately half of the states expressed an opinion favoring 7-digit dialing where an overlay has been implemented. Public preference is cited as the main reason. One state specifically favored 7-digit dialing due to its position that the desire to promote competition should not outweigh the public interest. At least two states listed support for 7-digit dialing with the implementation of a service specific overlay, neither of which is currently allowable under FCC rules.

A number of states did not support 7-digit dialing for calls originating and terminating in the same NPA where an overlay has been implemented. For those states, two separate reasons were given. The first was that the FCC rules do not allow for 7-digit dialing with implementation of an overlay. The second was that the states would prefer to make 10-digit dialing the uniform nationwide dialing plan. One state supporting 7-digit dialing did not believe that the move to 10-digit dialing would be a difficult one. In order to know if the support for 10-digit uniform nationwide dialing is growing, this survey would need to be taken again.

Should state regulatory commissions have a role in the administration or management of numbering resources, in addition to defining area code relief? If so, describe this role.

An overwhelming majority of the state respondents favored a greater state role in the process of number administration. The role envisioned by those states is not related solely to NPA relief. Non-discriminatory administration of numbering resources among SPs, maintenance of competitive neutrality in number assignment, setting of number administration policy, and development of some state-specific requirements were identified as areas which states thought they were well-suited to handle. While states generally believe they are in a better position to administer numbering resources, there was acknowledgment that federal/FCC guidelines were important to retaining uniformity. At least two states felt the ability of a state to review all numbering plans was important. One state, not indicating a preference, cited the importance of states getting involved with the industry to adopt numbering resource optimization measures and allocate numbering resources. Of those states not expressing a need for greater state authority in numbering matters, the only reason given was the belief that numbering management should be retained by the industry, NANPA, or an independent third party. Overall, the states responding to the survey clearly have an interest in number administration over and above accepting and rejecting NPA relief plans.

What specific type of direction, if any, from the FCC would assist your state in optimizing the use of numbering resources?

Responses to this question ranged from the general, such as, the FCC should establish guidelines that states may follow; to the specific, such as, the FCC should establish national standards for number pooling. The most common responses generally advocate national guidelines for numbering resource optimization efforts. Those advocating FCC guidelines were roughly split between the FCC adopting prescriptive guidelines/standards, and more general suggestions for the states implementing different forms of number conservation or relief. One state response indicated a need for national guidelines while preferring direct management of numbering resource optimization measures at the state level. Of the states advocating national guidelines, several associated an immediacy with their response, asking for guidelines "quickly" to "speed" the availability of measures like number pooling to the states.

Of the more specific responses, two states recommended national pooling standards, with one citing the need for FCC action on pooling between SPs regulated and those not regulated by State commissions. Two other states suggested the need for the FCC to address usage of NXXs and making numbers available in blocks smaller than 10,000, but did not specifically mention number pooling. Other states' recommendations for direction from the FCC were: 1) technical feasibility studies on number resource optimization measures; 2) the delegation of number administration to the states; 3) development of a standard number utilization survey for use by states; 4) taking a lead role in developing code conservation so the need for NPA relief is minimized; and 5) the establishment of a joint State/NANC board.

The responses to this question demonstrate a demand for general FCC guidelines regarding numbering resource optimization measures.

What national policy changes, if any, are required to facilitate optimal number resource utilization?

Again, the responses to this question lack a majority opinion. A number of states believe they should have greater authority over NPA relief and number administration, and that the FCC should delegate that authority to them. Some states believe the FCC prohibition on service specific overlays should be re-addressed because no harm has been proven to result from this type of overlay. One state characterizes the FCC requirement that one NXX in the existing NPA must be reserved for a new entrant prior to the implementation of a geographic overlay as unnecessary and causing premature exhaust. Specifically, that state lists three options that should be considered: 1) eliminating the requirement completely; 2) assigning ten one-thousand blocks instead; or 3) assigning a full NXX but allowing retrieval of all but a single thousands-block for use in number pooling. A final state issue related to NPA relief is a recommendation that two-year NPA exhaust forecasts be the standard with jeopardy measures implemented one year prior to exhaust, and a minimum one year permissive dialing period.

Two other states express concerns with the new NANPA's performance thus far. One feels that the NANPA must enforce fill-rate requirements and perform audits to ensure compliance with the requirements. Another feels that the NANPA has authority to do

more than it is doing in terms of number conservation. Because these are relevant concerns, the NRO-WG recommends the NANC ensure these issues are addressed by the appropriate group, e.g., NANPA Oversight Working Group. Yet another state believes that an assessment of the code applicant's potential of utilizing the requested resource in the near term should be considered when assigning multiple NXXs where a carrier is unlikely to ever use more than a handful of numbers from those NXXs.

Finally, one state expressed concern with the LERG's listing of numbers at the NXX level not being compatible with NRO-WG measures such as number pooling and code sharing. That state recommended national policies based on industry consensus to remedy the incompatibility.

Would the availability of a uniform, nationwide set of number resource optimization measures be useful to your state? If so, list specifically what information you would like (measure descriptions, implementation plans, analysis of measures, etc.)

Nearly all of the states responding to the survey believed that a uniform, nationwide set of number resource optimization measures would be useful. Suggestions offered by one or more states included:

- measures should be flexible enough to allow variations from state to state;
- measures should include understandable supporting rationale;
- states should have the ability to branch out from the national guidelines;
- measures should include descriptions, costs, impacts, time frames for implementation, and technical capabilities necessary;
- there should be mandated compliance with the guidelines once a state ordered one of the measures; and
- a process should be devised to assess effectiveness of measures in a given situation to determine optimum deployment.

In addition, one or more states suggested that the following areas warrant further consideration:

- alter the practice of assigning full NXXs to all SPs;
- develop NPA exhaust projection and carrier resource audits;
- draft into the national guidelines technical detail on LNP based measures;
- develop actual implementation plans and
- devote more resources to the long-term initiatives.

While some of the recommendations regarding the standard guidelines are quite different from state to state, it is clear from the responses received that standard NRO-WG guidelines addressing the measures identified in this report would be welcomed by the states.

Only one state response indicated that they did not believe a uniform, nationwide set of number resource optimization measures would be useful. Another state believed uniform measures might constrain their ability to implement state-specific measures. To this same point, another state responded that uniformly applied measures would be impossible due to state-by-state differences. However, the purpose of the NRO-WG was to develop a set of usable and implementable guidelines which are not mandatory but that were sufficiently flexible to embrace technological improvement. Therefore, the SITF did not interpret this response as absolute disagreement with the development of uniform measures.

15.4 Rate Center Consolidation

A number of states reported implementing this measure. Colorado has ordered 43 rate areas consolidated into 16, Minnesota consolidated 21 rate areas into 1, and Texas consolidated 108 rate areas into 31. Minnesota reported having some problems initially with default routing for 911 calls, but solved the problems by requiring CLECs to obtain at least nine separate CO codes so default routed calls could be forwarded to the proper public safety answering point (PSAP) using the CO Code. Texas reported similar 911 concerns but managed to correct the problems by using a system of class marking, using Line Class Codes[38] so that 911 default routing to the proper PSAP was no longer dependent solely on the CO code. Colorado has not yet implemented their consolidation; however, 911 concerns were a primary issue in the rate center consolidation docket. The Colorado Commission ordered the use of separate line class codes as a means of addressing the 911 problems. Because all three states implementing rate center consolidation have come across the same 911 default routing problem, a solution or set of solutions for 911 default routing may be warranted.

15.5 Extended Local Calling Area (ELCA)

Texas approved ELCA for wireless SPs in the 972 NPA and stated that it was investigating the utilization of optional 2-way EAS (extended area service) as well. No specific concerns with ELCA were listed. At least one other state addressed this question providing specific comments regarding EAS. It appears that this state may have been unaware that the term ELCA as referenced in the survey is more commonly referred to as wireless wide area calling plans, not EAS in the wireline context. It also appears that many responses in the aggregated response matrix may have been based on States understanding of EAS, not ELCA.

15.6 Geographic Number Portability

While no state reported experience with the implementation of geographic number portability, one state did express its belief that geographic portability would impose high costs on society.

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[38] A switch based line feature that allows routing on an individual telephone number basis.

15.7 Inconsistent rate areas

Texas approved inconsistent rate areas in the interconnection agreements of three CLECs. The major issues brought up were 911 default routing, number portability, and customer confusion. The 911 routing issue is substantially similar to the issue with rate center consolidation. The number portability issues have to do with the industry agreement not to port a customer beyond the boundaries of a rate center so that SP-rating systems can properly bill for a call. Customer confusion might result from the different rate areas used by the CLECs as opposed to the traditional ILEC and the different calling plans adopted by each. What is a local call for one carrier, may be a toll call for another because of the inconsistent rate areas.

15.8 Eliminate Protected Codes (Mandatory 10-digit dialing)

While a few states have implemented mandatory 10-digit dialing, none provided further information on the effects or implementation concerns. Pennsylvania specifically noted that it has directed implementation of 10-digit dialing in the 215 and 610 NPAs, where overlays were ordered. However, they are still in the network preparation stage and had no results yet to report.

15.9 Individual Telephone Number Pooling

In approximately December 1997, the Colorado Public Utilities Commission staff obtained number utilization data from all central office code holders in the 303 NPA. Under the direction of the Colorado Numbering Task Force, this data was to be used to evaluate the effects of number pooling. The data was obtained from the code holders under the Commission's statutory audit and subpoena authorities and upon a guarantee of maintaining the confidentiality of individual carrier data. The Commission staff assembled the number utilization data by thousand block into a model that was capable of examining the forecasted exhaust dates and utilization rates under various pooling scenarios. During the period of data gathering, the 303 NPA was in a jeopardy situation and was forecasted to exhaust approximately in June 1998. Therefore, under existing ten thousand block (NX) allocation of numbering resources, the 303 NPA was essentially exhausted. The model was prepared in expectation of number pooling and expected to estimate the effect on the exhaust date under both thousand block and individual telephone number pooling. Results of the study show that Colorado, theoretically, could have reclaimed approximately 23% of the NPA resource through thousand block pooling and an additional 8% from ITN pooling (for a total of 31% reclamation through ITN pooling).

15.10 Thousands-Block Number Pooling

Thousands-Block number pooling is an ongoing process in several states: Colorado, Connecticut, Florida, Illinois, New York, Pennsylvania and Texas, have processes in place which are termed number pooling implementation. In some instances number pooling is

actually being implemented and in some others pooling is simply a ("virtual pooling") trial being monitored on paper only. Florida did not provide details of their activity.

Colorado has done a significant amount of study into thousands-block number pooling. The results of this study are described in the ITN section above.

Connecticut, for example, has ordered thousands-block virtual pooling[39] or "sequential number assignment", which is defined as the process whereby SPs must assign numbers from an NXX one thousand blocks at a time in order to keep the maximum possible thousand blocks uncontaminated for use in thousands-block number pooling.

Illinois implemented a trial of thousands-block number pooling on June 1, 1998, in the 847 NPA serving the Chicago suburbs, with Lockheed Martin acting as the pooling administrator. Illinois has done extensive work on evaluating number pooling and drafting guidelines and rules for number pooling. Like Texas and New York, Illinois collected carrier utilization data to help in their evaluation of pooling. Prior to thousands-block implementation, Illinois SPs voluntarily began sequential number assignment. The Illinois thousands-block number pooling trial is still in its early stages. An August 21, 1998 Illinois Number Pooling trial interim status report is included as Attachment 3-4a.

New York began a number pooling trial in the 212 NPA in July 1998. The trial may later expand to the 718 NPA. New York, like Texas, has collected carrier utilization data to assist in the number pooling evaluation and implementation. Data submitted, as of April 1, 1998, show overall service provider number utilization rates of 64.7% and 62.2% in the 212 and 718 NPAs, respectively. New York also provided data on the numbers available for assignment as compared to the numbers donated for number pooling. Out of 2,250,290 available numbers, 53,000 numbers have been donated to the 212 number pool. As of September 9, 1998, there has been one thousands-block requested.

Pennsylvania has directed that service providers use thousand blocks sequential numbering, sometimes referred to as virtual pooling, as a number conservation measure, directing that SPs cannot assign numbers from the next sequentially higher block of 1,000 numbers in an NXX until at least 70% of the numbers in the lower block have been assigned. It has also directed that assignment and fill rates of NXX codes to the thousand block level be reported to the Commission every six months. Pennsylvania has also directed the Code Administrator to reserve fifteen NXX codes in four NPAs that were the subject of traditional NPA relief this spring (two overlays and a split), to enable Pennsylvania to implement some form of pooling in the near future.

In addition to requiring sequential number assignment, Texas has begun a process termed "virtual number pooling" in an attempt to determine the effect of pooling without actually implementing it. This is accomplished by reporting pooling information on paper only. This number pooling trial will initially be held over a 3-month period, and the Texas PUC

[39] It should be noted that the term “virtual pooling” may be defined differently in different states. Readers may wish to review documentation available in individual states to fully understand what is meant by this term.

expects to determine where implementation of number pooling will be beneficial and to examine the costs associated with actual implementation.

In addition to collecting carrier utilization data, the virtual pooling trial will consist of tracking the number of service orders issued each month that involve an addition/change of telephone number. This information will provide valuable facts on telephone number usage and changes that will permit a quantification of the impact on NPA exhaust and activity that the various provider and industry number administration systems must be capable of handling. In addition, this data will be used to determine what, if any, impact number pooling will have on LNP data bases beyond those anticipated in a non-number pooling environment.

15.11 Code Sharing

In response to the survey question regarding "NXX Code Sharing" both Pennsylvania and Texas reported they had wireless SPs sharing codes with ILECs. In Pennsylvania, wireless SPs participating in code sharing are doing so via a Type 1 interconnection agreement. In Texas, wireless SPs are doing so via Type 1 interconnection agreements. In both cases, neither the type of wireless carrier (i.e. PCS, Cellular, Paging, etc.) was identified nor was the type of the code sharing being utilized identified. Both of these items, in addition to the type of interconnection agreement, should be addressed when considering using code sharing as a number optimization measure.[40]

15.12 CO Code Assignment Guidelines

While a number of states supported tightening up the guidelines, only Illinois reported on the actual measures it had implemented. However, Pennsylvania stated it began seeking carrier data in support of NXX requests in February 1998. Pennsylvania continues to monitor NXX utilization and requests to ensure efficient use of numbering resources.

The Illinois Commerce Commission, in 97-0192/97-0211 consolidated May 8, 1998, ordered that:

> (1) All carriers and paging companies that provide, or plan to provide, service in the 847 NPA were required to provide a code forecast by December 3, 1997. The Number Administrator will not consider a code request from any carrier that has not previously provided a code forecast;
>
> (2) Before being assigned an NXX code for growth, every code applicant is required to complete and deliver to the Number Administrator a Months to Exhaust Worksheet which identifies the number of telephone numbers the applicant has available for assignment in a rate center, how many numbers the applicant has used in the past six months and how many numbers the applicant projects to use in the next 12 months;

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[40] "Wireless Telecommunications Ai-Di Interfaces Standard" TIA/EIA-93 Rev. A

(approved for ANSI publication 8/98).

(3) Applications for new NXX codes will not be accepted by the Number Administrator sooner than 90 days before they are required. Presumably, the Number Administrator will be able to make this determination from the Months to Exhaust Worksheet;

(4) A code holder must file a Confirmation of Code Activation with the Number Administrator within 90 days after the code is activated. NXX codes not activated in a timely manner are subject to reclamation by the Number Administrator;

(5) For all newly assigned codes, carriers agree to administer the codes in blocks of one thousand numbers. A thousand block should be at least 90% full before numbers are utilized from additional thousand blocks unless a specific customer requirement for numbers cannot be satisfied from the thousand blocks already in use;

(6) Carriers may not assign numbers from NXX codes requested for growth until at least 75% of the numbers in that carrier's existing NXX codes in a rate center have been utilized, except to satisfy a documented customer requirement based on technical limitations or the need for a consecutive block of numbers not available in the existing NXX codes. Notwithstanding this requirement, a carrier may request a code required for a special use (such as to identify a class of service with a unique billing arrangement) but may not request additional special use codes until its existing special use codes used for the same purpose are at least 75% utilized. An exception to the 75% fill rate requirement would apply where the applicant certifies to the number administrator that it will have a bona fide need to use numbers from a new NXX code for growth within 90 days, even though its existing NXX codes are not yet 75% utilized;

(7) A code holder would be required to refrain from assigning numbers from any thousand block in an NXX with 50 or fewer numbers currently in use until it had used at least 90% of the numbers in the other thousand blocks in that NXX;

(8) A code holder would open only one thousand block at a time in an NXX and utilize 90% of those numbers before opening an additional thousand block;

(9) An exception to (7) and (8) would apply if the code holder certified to the Number Administrator that it needed to open an additional thousand block (or request a new NXX code) in order to satisfy a bona fide request from a customer for a consecutive block of numbers that could not be satisfied in any other way. The numbers would have to be activated within six months, or any new NXX code assigned to meet this request would be reclaimed.

Illinois provided no analysis on the success of the conservation measures.[41]

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[41] Some clarification and explanation regarding the applicability of these measures to all codes, not just newly assigned codes, and the total utilization rates versus utilization rate per rate center was included in

the Illinois Commerce Commission's May 8, 1998 Order in Docket 97-0192/97-0211 Consolidated at page 23.

15.13 Unassigned Number Porting

No state provided additional information regarding experience with this measure.

15.14 Reducing Potential for Geographic Exhaust

No state provided additional information regarding experience with this measure.

15.15 Reduce Demand for Individual TNs

No state provided additional information regarding experience with this measure.

15.16 Route Indexing

No state provided additional information regarding experience with this measure.

15.17 Additional State Comments & Opinions

The survey provided the respondents the opportunity to provide additional comments and opinions. Below are statements made by one or more states that suggest either additional policies or rules should be enforced or existing rules be modified or eliminated. It should be noted that state responses did not provide a detailed explanation, therefore, additional information from the states may be required to fully understand the intent of the their response.

- The purpose and utilization of the Local Exchange Routing Guide (LERG) may need to be reviewed to ensure that it is compatible with the changing numbering environment. National policies and standards may need to be developed for the use of the LERG.
- Some SPs are not responding to state specific requests or rules apparently due to federal/state jurisdictional issues. Therefore, some level of enforcement is required to ensure that code holders are subject to the rules and numbering guidelines that are issued by the states. In addition, audits should be conducted to ensure compliance with the guidelines.
- Some states have conducted surveys or initiated telephone number utilization data requests to assess the efficiency of number assignment or number availability. Since these surveys or requests vary, it is requested that standard number utilization surveys or reports be developed and made available for state use. It is further requested that quarterly or periodic reports be required.
- As numbering issues increase, whether code relief, audits, etc., states are playing a more prominent role. Interface between the states and the NANPA will increase, therefore, it is suggested that the NANPA must be accountable to the FCC and the states.

- One state suggested the current rate center design is inefficient. It proposes that planning should begin to eliminate industry reliance on the ILEC rate areas for routing, rating, and billing.
- The FCC has ordered that area code overlays must not be implemented for a specific technology or service. Some states continue to support service specific overlays as a code relief method and suggested the prohibition of the technology or service specific overlay be eliminated.
- States should be given more authority over number administration and NPA relief measures.
- National standards should be developed for all numbering optimization measures. National standards would relieve the states from convening extensive industry meetings for development of implementation procedures and would shorten the implementation time frames.

15.18 Proposed Standard State Data Request & Forecast

A comprehensive data request can assist commissions in determining where NPA relief can be delayed through number resource optimization measures. The data request formats have been developed in Microsoft Excel spreadsheet 2.0 and if completed according to instructions, can be converted easily to Microsoft Access for aggregation and reporting. Due to the proprietary nature of the data provided by individual SPs, commissions or neutral third parties collecting this data from SPs should treat the data in a confidential manner. The raw data must be aggregated so that the individual carrier information is indistinguishable when reported to the industry or public.

The data request is in two parts as follows:

Part 1 - Number Utilization Data: this is a comprehensive data request for reporting of NXX utilization.[42] Any company that is assigned an NXX should identify the NXX by rate center and provide the requested information by thousand number blocks. Each NXX has its own data file, and the rate center names can either be inserted by the Commission into the data request for consistency or a table of rate center names can be provided separately. The key to the success of any data request is that the information be provided consistently, accurately and that all blank cells be completed (even if the answer is zero). Detailed instructions for completing each section are included as a separate sheet in the Attachment.

Part 2 - Number Forecast Data Request: this is a form for reporting your thousand number block forecast for each NXX beginning with 3Q98 and ending with 4Q99.[43] Those SPs that are not LNP capable and will require whole NXXs should enter how many full NXXs

[42] See Attachment 1-2.

[43] See Attachment 1-3.

you will need in each rate center. The rate center names may be included in the spreadsheet so you simply have to populate the number of 1000 number blocks/NXX codes under the rate areas that apply to your company in each NPA.

It appears that the INC is nearing closure on definitions regarding what constitutes an assigned versus an available telephone number. Since it is desirable for SPs and states to consistently provide utilization data pursuant to standardized definitions, when the definitions become final they should be included in the data request. Other definitions such as that for reserved numbers being worked by the NANC should also be considered.

15.19 Conclusion

The majority[44] of the states continue to prefer the Geographic Split as an NPA relief option. A significant number of states favoring the All Services Overlay list mandatory 10-digit dialing as the primary disadvantage. A number of States favor keeping 7-digit dialing in place when implementing an overlay and some states expressed support for FCC reconsideration of this issue .[45] The responses to the first two essay questions bear this out. The options available for NPA relief are limited, and from the survey responses it seems that many states would prefer greater latitude over NPA relief decisions.

Numbering administration is an area over which the FCC has declared sole jurisdiction. However, with the lines now crossing between NPA relief and number administration, most States feel the need for a greater role in the administration of numbers as well.[46] States recognize the importance of national guidelines, but seek the flexibility to require SPs to make the most efficient use of a limited and important public resource. States generally feel that they are closer to the public and may better manage number resources in the public interest.

The comments by states regarding guidelines are quite varied, but the goal of more efficient use of numbering resources is ubiquitous. While it is not clear what type of guidelines, general or prescriptive, the states desire, it seems that states will support the national efforts should they lead to reasonable number resource optimization guidelines.

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[44] Of the 28 states responding to the optional question 1, 13 states indicated they address the issue on a case-by-case basis or have made no formal ruling on preference, and two of those states indicated they had implemented splits. Nine states expressed a preference for splits. Six states expressed a preference for overlays. Of those, two expressed a preference for service specific overlays. Seven states indicated they had implemented splits. Three indicated they had implemented overlays.

[45] Of the 24 states responding to the optional question 2, 14 indicated their support for 7-digit dialing where an overlay has been implemented. Nine indicated they either supported 10-digit dialing, or that 10-digit dialing was an FCC requirement. One state indicated that 7-digit dialing when implementing an overlay was under review.

[46] Of the 25 states responding to the optional question 3, 19 indicated a desire for states to have a role in the administration or management of numbering resources in addition to defining NPA relief. Four responded they would not support such a state role. One state indicated that it was not currently interested in such a role, but that it may be in the future. A final state indicated that states should work with industry on allocation of numbering resources and NPA relief, but did not state a definitive yes or no answer to the question.

Regardless of the whether the guidelines look more like rules or actual guidelines, States seem to prefer that they be detailed and include supporting rationale.

The discussions on national policy changes are mostly centered around FCC action on NPA relief. Again, states express the need for greater authority and for the FCC to readdress some of the decisions it has made on NPA relief, specifically the rules for implementing overlays.

As anticipated by the NRO-WG, the states have actively taken on the role of testing new number resource optimization measures. While no one state has experience with all measures, together they have tested or implemented many of the number resource optimization measures. Specifically, states have firsthand experience with NPA splits, overlays, rate center consolidation, extended local calling areas, inconsistent rate areas, eliminating the protected NXX codes, studies on individual telephone number pooling, thousand block pooling, code sharing, and altering the CO Code assignment guidelines in jeopardy situations. To this end, state input into any national number resource optimization guidelines is invaluable.

Many states have endeavored to obtain detailed data from SPs to support implementation of number resource optimization measures when NPA relief planning has begun in areas of rapid NXX exhaust. The data request format offered here by the SITF seeks to standardize the data requested so that SPs do not have to "reinvent the wheel" every time they are asked to provide utilization data in a particular State. The forecast file is flexible enough to permit all SPs, even those that are not LNP-capable, to provide Commissions with a forecast of future NXX demand. Once combined with utilization data, States can make informed decisions about NPA relief. While the SITF recognizes that the needs of each State are unique and decisions about what measures to implement are best left to the local Commissions, utilization and forecasting of NXX codes in high growth areas can assist with difficult NPA relief and planning decisions in the immediate future.

States need to take it upon themselves to participate in national forums. Where that is not possible or taking place, however, the national forums should actively seek out state input as the SITF has done. Doing so will promote more easily accepted national number resource optimization guidelines and policies.

The State Issues Task Force appreciates the efforts of those contributing to this report, specifically, the 36 Commissions responding to the State Issues Task Force survey on number resource optimization measures, and the NARUC.

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15.20 Attachment 1-1 [Blank Survey]

Measures that Affect Local Calling:	**Are you familiar with? (Yes or No)**	**Do you favor implementation of? (Yes or No)**	**Do you plan to/have you implement(ed) (Yes or No) If yes, when?**	**Rank (High, Medium Low) your interest in**	**Have you collected data/info regarding ..(Yes or No) If yes, how and what type, (commission, staff, data request, etc.)**
A. Rate Center Consolidation					
B. Extended Local Calling Areas/Wide Area Calling Plans					
C. Geographic Number Portability					
D. Inconsistent Rate Centers					
E. Eliminate protected codes (mandatory 10-digit dialing)					
Measures that are LNP-based:					
F. Individual Telephone Number Pooling					
G. 1000 (NXX-X) block Number Pooling					
H. Unassigned Number Porting					
Measures that do not require LNP:					
I. NXX Code sharing					
J. CO Code Assignment Guideline related measures: 1. Audits/increased compliance 2. More stringent requirements 3. Enforce fill rate requirements	 1. 2. 3.	 1. 2. 3.	 1. 2. 3.	 1. 2. 3.	 1. 2. 3.
K. Reduce potential for geographic NPA exhaust					
L. Reduce demand for individual TNs					
M. Route indexing					

Please feel free to attach additional data/information/opinions:

,

1. Which form of area code relief to you prefer and why? (geographic splits, geographic overlays, or service-specific overlays, other)
2. Do you support 7-digit dialing for calls originating and terminating in the same area code where an overlay has been implemented?
3. Should state regulatory commissions have a role in the administration or management of numbering resources, in addition to defining area code relief? If so, describe this role.
4. What specific type of direction, if any, from the FCC would assist your state in optimizing the use of numbering resources?
5. What national policy changes, if any, are required to facilitate optimal number resource utilization?
6. Would the availability of a uniform, nationwide set of number resource optimization measures be useful to your state? If so, list specifically what information you would like (measure descriptions, implementation plans, analysis of measures, etc.)
7. If you have any input, information or experience in studying or implementing measures A-M, please share this valuable feedback. (BRIEF, SUMMARY ATTACHMENTS ARE WELCOME)

Please use this page for further summary, or attach to this page documentation or data relating to any of the above questions.

REPLACE THIS PAGE WITH:

ATTACHMENT: 1-2

TITLE: Data Request Sample

Excel spreadsheet

REPLACE THIS PAGE WITH:

ATTACHMENT: 1-3

TITLE: Instructions and Forecast Model Sample

Excel Spreadsheet

16 GLOSSARY

TERM	DEFINITION
Activate-as-Needed	A procedure by which Service Providers contact the Neutral Third Party database to activate numbers as they are required for service
Address Location Identifier (ALI)	A database which cross references an end user telephone number to the primary address where that telephone number is working
AIN	Advanced Intelligent Network
ALI	See Address Location Identifier
ANI	Automatic Number Identification; an end user telephone number as displayed in an MF signaling format. Most commonly used by Service Providers and Public Safety agencies
ATF	For purposes of this document, the Analysis Task force of the NRO, A task force which serves at the pleasure of the Numbering Resource Optimization Working Group to identify and recommend methods to more efficiently utilize the resources of the North American Numbering Plan
Block Holder	In Thousands Block Pooling, the entity which has been assigned a block of 1,000 consecutive numbers.
Cause Code 26	In the Number Portability Administration Center, an error code which indicates that local routing information was not available for a given telephone number
Central Office Code Assignment Guidelines	A set of industry principles which governs the assignment and administration of telephone numbers in the North American Numbering Plan
Central Office Code Utilization Survey	A forecast submitted by Service Providers to Code Administrators for the purpose of estimating the life of and NPA Code.
COCUS	See Central Office Code Utilization Survey
Code Administrator	A neutral third party designated by NANC to oversee the assignment and administration of telephone numbers in the North American Numbering Plan
Code Holder	The entity which was originally assigned or has designated responsibility for a given NXX (block of 10,000 consecutive numbers)

DPC	Destination Point Code; a nine digit numerical address which designates the terminating or destination location for message in a Signaling System 7 Network
EDR	Efficient Data Representation; A data formatting method which facilitates the transfer of large ranges of numbers as a single message
Geographic NPA Split	The division of an NPA for the purposes of relief by assigning the old NPA to one part of the division, and the new NPA to the other part of the division
Geographic Portability	The ability to port a number to other than its original rate center while obtaining the properties of the new rate center
GTT	Global Title Transfer
IN	Intelligent Network;
INC	Industry Numbering Committee; a committee of ATIS which facilitates the establishment and monitoring of standards for the assignment and administration of numbers in the North American Numbering Plan
Individual Telephone Number Pooling	Individual Telephone Number Pooling; a potential numbering optimization method, under which, telephone numbering resources would be assigned to Service Providers on an individual basis rather than on a block on NXX basis.
ITN	See Individual Telephone Number Pooling
LERG	Local Exchange Routing Guide; A Publication of Bellcore, which documents switching and routing information necessary for the exchange of traffic among service providers in and for the North American numbering plan
LERG Assignee	The entity to whom a range of numbers, currently an NXX, is assigned in the LERG
Line Utilization Survey	A forecast tool which is proposed to supersede COCUS
LINUS	See Line Utilization Survey
LNP	Local Number Portability; a principle which facilitates the transfer of local 10 digit telephone numbers from one local service provider to another
LNPA Working Group	A working group which serves at the pleasure of the North American Numbering Council to identify and resolve operational issues which impact local number portability

LRN	Location Routing Number; a ten digit number which designates a given Service Provider switch for number portability purposes
LSMS	Local Service Management System; a database which interacts with the Number Portability Administration Center to provide routing information for a call in a Local Number Portability environment
MSA	Metropolitan Statistical Area
NANC	North American Numbering Council; an industry group which serves at the pleasure of regulatory bodies in the North American Numbering Plan (e.g. Federal Communications Commission, Canadian Radio and Telecommunications Commission) to guide policy with regard to telephone number assignment and administration in the North American Numbering Plan.
NECA	National Exchange Carriers Association; An association composed of local and long distance carriers whose purpose is to facilitate standards for billing and routing information exchange in the North American Numbering Plan
NENA	National Emergency Numbering; an industry association which develops and oversees standards for emergency number systems (most prominently 911) in the United States
NPA	Number Plan Area; also known as an area code; a three digit number which is used to route a call to a designated geographic area or specialized service within the North American Numbering Plan
NPAC	Number Portability Administration Center; A system operated by the designated Number Portability Administrator, which facilitates the operation of Local Number Portability within the North American Numbering Plan
NRO-WG	The Numbering Resources Optimization Working Group; A working group which serves at the pleasure of NANC to identify and recommend methods to forestall and if possible prevent the exhaust of the North American Numbering Plan
Number Aging	The principle which holds numbers in an inactive status for a designated period of time after they have been disconnected from active use
Number Pooling	The allocation of numbers to a Service Provider, through the use of a neutral third party administrator, on less than an NXX basis.
NXX	In the standard North American telephone number format, the second three digits which designate a telephone number attached to a

	particular rate center
NXX Code Sharing	The assignment of portions of an NXX Code to more than one Service Provider
OCN	Operating Company Number; a four digit code, administered by NECA, which is utilized for the inter-carrier exchange of billing and other information
OCN	Operating Company Number; A four digit number assigned by NECA (the National Exchange Carriers Association) which identifies a Service Provider for purposes of the exchange of billing and other information.
OSS	Operational Support Systems; Systems utilized by Service Providers to provision, maintain and bill services
Overlay NPA	A method of NPA relief which makes additional telephone numbers available by introducing an additional area code in the same geographic area as the old area code.
Point Code	A nine digit address code utilized in a Signaling System 7 environment to exchange Signaling System 7 messages and routing information
Pooling Administrator	A neutral third party designated by NANC to oversee the assignment of number blocks in the North American Numbering Plan
Port-on-Demand	A method utilized in a Number Pooling environment under which telephone numbering resources are ported to a service provider upon request
Pre-Port	A method utilized in a Number Pooling environment whereby blocks of numbers are assigned to a Service Provider in advance of being activated
PSAP	See Public Safety Answering Point
Public Safety Answering Point	A centralized answering point for emergency (e.g. police, fire, EMS) calls which serves a prescribed geographic area
Rate Area	A geographic subdivision of a Rate Center used to rate and route local and in some cases, long distance traffic
Rate Center	A geographic subdivision of a LATA used to rate and rout local and long distance traffic
Reclamation	For purposes of this document, the taking back of a numbering resource which has not been activated in a time frame prescribed by Central Office Code Assignment Guidelines

SCP	Signal Control Point; A system which processes and transmits Signaling System 7 messages
Selective Router (SR)	A device which reads an end user's ANI upon placement of an emergency call, and routes the call to the Public Safety Answering Point (PSAP) which is responsible for that end user
Service Management System	A database utilized to provide routing information in a number portability environment
Service Provider	An entity which is certified to provide telecommunications services
Snap-Back	The principle by which a telephone number returns to the designated Block Holder or Code Holder when it is disconnected from an end user.
SOA	Service Order Administration System; a system which facilitates the placement of orders for the porting of numbers from one Service Provider to another or from a Pool to or from a Service Provider
SP	An abbreviation for Service Provider
SPID	Service Provider Identification; a four digit code, typically the Service Provider's Master Operating Company Number (OCN) which identifies the Service Provider for routing and billing purposes.
STP	Signal Transfer Point; a designated switch
Thousands Block Pooling	The allocation of numbers to a Service Provider, through the use of a neutral third party administrator, by blocks of 1,000 numbers.
TN	Telephone Number; an identifier in the NPA-NXX-XXXX format
Unassigned Number Porting	The ability for a Service Provider to port a number from another carrier's inventory even though the number may not be active
Wireless	That segment of the telecommunications industry which provides service primarily or exclusively by radiotelephone to devices which are not tied to a fixed location (e.g. Cellular, PCS, IMTS, 800 MHz trunked radio)
Wireline	That segment of the industry which provides telecommunications services primarily or exclusively to devices which are tied to fixed location

APPENDIX A

March 23, 1998 Letter from Mr. Metzger to Mr. Hasselwander

APPENDIX B

March 27, 1998 FCC/NANC Public Notice Announcing Formation of Number Resource Optimization Working Group

Minority Opinion of Cox Communications and “Minority Parties” regarding Report of NRO-WG

National Association of State Utility Consumer Advocates Separate Opinion Concerning Number Resource Optimization - Working Group September Report

ATF Cost Questionnaire Overview

Introduction

The ATF developed and distributed three questionnaires intended to gather data on various number optimization measures. Specifically two questionnaires requested cost and timing information on implementing various number optimization measures. A third questionnaire also sought information on end user cost for implementing a new area code. The questionnaires were sent in early August to selected entities within the following three groups: network service vendors, service providers, and end users. Responses were requested by August 28th, with a subsequent extension to September 4th. The three cost questionnaires and the accompanying cover letters are provided as background information.

The ATF committed that the information provided by respondents would be treated as confidential. Therefore, the actual responses are not provided here in order to respect the confidential nature of the information. The attached matrix is a summary of those responses that were submitted to and reviewed only by the two ATF Co-Chairs. Because the NRO has not completed its analysis of all the number optimization alternatives this matrix is limited by necessity to summarizing data on only ITN and Thousand block pooling.

Overview of Three Questionnaires

The Vendor Questionnaire (Attachment A) includes questions about seven different optimization measures. For each of these questions, the respondent was requested to select from among 11 cost ranges, as well as provide implementation time requirements. This questionnaire was sent to ten vendors, and responses were received from six. However those responses indicated they would only provide relevant cost information to their customers (e.g. Service Providers). Therefore vendor costs may have been included in some service provider responses.

The Service Provider (SP) questionnaire (Attachment B) includes eight categories of cost for all fourteen number optimization measures. Respondents were asked to provide data within a sample MSA. They were requested to select from six cost ranges within each of these categories as well as to identify an implementation time frame. In addition, respondents were requested to provide an estimated quantity of subscribers they serve within the MSA. The Service Provider Questionnaire was distributed through the NRO Co-Chairs and the Chairman of NANC. Six responses were received, however one response simply recommended that the FCC seek such information directly and then afford such responses confidential treatment.

The end user questionnaire (Attachment C) primarily focuses on gathering information on the cost of introducing a new area code. The ATF generally agreed that many of the optimization measures would not present end user cost impacts and, therefore, with limited exceptions, questions were not asked of end users relative to the specific measures. Demographic information on each respondent was also requested. This questionnaire was distributed to NASUCA members (i.e., consumer counsel/advocate agencies in each of the states), members of the Ad Hoc Telecommunications Users Committee, and various national organizations including the

Consumer Federation of America, the National Emergency Number Association, the United States Chamber of Commerce, the National League of Cities, and the National Safety Council. Four responses were received. To the extent that the implementation of any of the 14 number optimization measures avoids or delays the need for area code relief, end users would avoid certain costs. The end user cost questionnaire matrix summarizes the responses to the end user cost questionnaire.

ATF members felt that given the low response rate for all three questionnaires, little if any conclusion can be drawn from the data and as such it is offered for information purposes only.

The ATF intents to submit a second cost matrix covering the other optimization measures as they are analyzed.

CELL ADDRESS	LABEL IN **A6**	INSTRUCTIONS
R1C5		CODE HOLDER NAME
R2C5		CODE HOLDER TELEPHONE NUMBER
R7C1-	(NPA)NXX-#	LIST EACH THOUSAND BLOCK, BEGINNING
R16C1		WITH 0000 THRU 9000. ALL BLOCKS ARE REPORTE
		IF ZERO, POPULATE CELL WITH ZEROS THROUGH
R7C2-	WORKING	PROVIDE THE TOTAL QUANTITY OF
R16C2		WORKING INDIVIDUAL TELEPHONE NUMBERS IN
		EACH THOUSAND BLOCK. VALID ENTRIES
		RANGE FROM 0 - 1,000.
		THE DEFINITION FOR WORKING IS ANY
		TELEPHONE NUMBER WORKING TO ANY END
		USER--THIS INCLUDES POTS, OFFICIAL SERVICES,
		BUSINESS, TYPE 1 WIRELESS, DID, PLEXAR, ETC.
		IF A BLOCK OF 500 NUMBERS IS ASSIGNED BY
		A LANDLINE PROVIDER TO A WIRELESS PROVIDER
		FOR TYPE 1 SERVICES, REPORT ALL 500 AS WORK
R7C3-	RESERVED	PROVIDE THE TOTAL QUANTITY OF RESERVED
R16C3		TELEPHONE NUMBERS WORKING WITHIN EACH
		THOUSAND BLOCK. A RESERVED NUMBER IS ANY
		NUMBER THAT IS MARKED IN THE PROVIDER'S
		NUMBER ASSIGNMENT DATA BASE AS RESERVED
		A SPECIFIC CUSTOMER'S NEEDS. THIS NUMBER D
		NOT REPRESENT FUTURE ANTICIPATED NEEDS OF
		THE PROVIDER--FUTURE NEEDS ARE SPARE.
R7C4-	AGED	THE TOTAL QUANTITY OF TELEPHONE NUMBERS
R16C4		WITHIN EACH THOUSAND BLOCK THAT ARE IN
		AN "AGING "STATE. ANY TELEPHONE NUMBER
		THAT HAS DISCONNECTED NORMALLY IS NOT
		RE-ASSIGNED UNTIL SOME MONTHS HAVE PAST.
		THIS TOTAL REPRESENTS THESE AGED NUMBERS
R7C5-	TEST	THE TOTAL QUANTITY OF NUMBERS WITHIN EACH
R16C5		THOUSAND BLOCK ASSIGNED TO SOME TYPE OF
		PROVIDER TEST SERVICE. THE USE OF NUMBERS
		FOR TEST PURPOSES IS NORMALLY RATHER SMA
R7C6-	TOTAL	THE SUM OF EACH CATEGORY FOR EACH THOUSA
R16C6		BLOCK. THIS COLUMN IS POPULATED BY THE
		FORMULA IN SPREADSHEET.
R7C7-	RATE CENTER	THE RATE CENTER NAME TO WHICH THE REPORT
R16C7		NXX IS ASSIGNED. THIS RATE CENTER NAME MUS
		THE EXACT SPELLING OF RATE CENTERS PROVID
		ATTACHMENT TO THIS DATA REQUEST. BE SURE
		DRAG THE RATE CENTER NAME DOWN THROUGH

				THOUSAND BLOCK ROWS (e.g. 7-16)				
R7C8-		LNP Y/N		INDICATE WHETHER THE NPA-NXX BEING REPORT				
R16C8				IS LNP CAPABLE---Y OR N. IF THE NPA-NXX IS SCH				
				TO BECOME LNP IN THE FUTURE, AND A DATE IS S				
				"Y". (DRAG DOWN)				
R7C9-		LNP DATE		IF R7 IS MARKED 'Y', INDICATE THE DATE THE COD				
R16C9				WILL BE LNP CAPABLE. THIS DATE SHOULD BE TH				
				DATE AS INDICATED IN THE LERG. (DRAG DOWN)				
R7C10-		2W EMS		INDICATE WHETEHER THIS CODE IS OPTIONAL 2 W				
R16C10				OR EMS WITH A "Y" OR A "N". (DRAG DOWN)				
R7C11-		COMPANY		THE COMPANY NAME (DRAG DOWN)				
R16C11								
R7C12-		SP TYPE		SERVICE PROVIDER TYPE (ILEC,CLEC, OR WIRELE				
R16C12				(DRAG DOWN)				
EACH NPA-NXX ASSIGNED TO A PROVIDER MUST HAVE A RECORD REFLECTING THE ABOVE INF								
TELEPHONE NUMBERS THAT ARE SPARE OR UNASSIGNED SHOULD BE REPORTED AS ZERO.								

	EXAMPLE
	(214)222-0
D	
OUT.	
	R7-156
IING.	
	R7-55
FOR	
OES	
F	
	R7-45
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	R7-0
LL.	
ND	**R7- 256**
ED NPA-	**APPOLLO**
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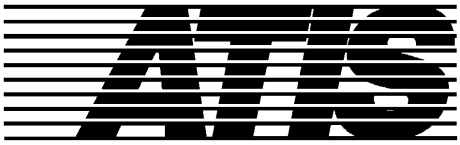
INC97-1017-019
Issued January 1998



Alliance for Telecommunications
Industry Solutions

Sponsor of

Industry Numbering
Committee

INDUSTRY NUMBERING COMMITTEE (INC)

INITIAL REPORT TO THE

NORTH AMERICAN NUMBERING COUNCIL (NANC)

ON

NUMBER POOLING

JANUARY 16, 1998

Jo Gallagher
Moderator

Assistant Moderator

Vice President and General Counsel

John C. Manning

ATIS

Fax: 202.393.5453

INDUSTRY NUMBERING COMMITTEE (INC)
INITIAL REPORT TO THE
NORTH AMERICAN NUMBERING COUNCIL (NANC)
ON NUMBER POOLING

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INITIAL REPORT TO THE
NORTH AMERICAN NUMBERING COUNCIL (NANC)
ON NUMBER POOLING

1.0 INTRODUCTION

This report defines, describes, and analyzes the number administration and assignment process known as number pooling. The report identifies the attributes or parameters associated with pooling, discusses the principles, assumptions, and constraints under which pooling can potentially be provided, develops specific alternatives for the implementation of pooling, and describes the impact of number pooling on network architecture, number assignment and administration processes. The impacts identified are incremental to any changes required to implement Local Number Portability. In addition, the report assesses the practicality of pooling with respect to certain criteria and identifies criteria for the characterization of the pooling alternatives, uses those criteria to assess the alternatives, explains how the transition from the current (central office based) number assignment process to pooling could potentially take place, and offers recommendations and conclusions relative to the use of pooling.

The report was compiled under the leadership of the Industry Numbering Committee (INC), which operates as part of the Carrier Liaison Committee (CLC) of the Alliance for Telecommunications Industry Solutions (ATIS). This industry effort was directed in part by the North American Numbering Council (NANC), a federal advisory committee for the FCC, and included participation of the two NANC Working Groups: the North American Numbering Plan Administration (NANPA) Working Group and the Local Number Portability Administration (LNPA) Working Group.

2.0 DEFINITION OF POOLING

Pooling of geographic numbers in a local number portability environment is a number administration and assignment process which allocates numbering resources to a shared reservoir associated with a designated geographic area.

Initially, the designated geographic area is limited to an existing rate center within a geographic Numbering Plan Area (NPA) with possible future expansion to beyond the rate center.[1] The numbering resource in the shared reservoir would be available, potentially, in blocks of numbers or on an individual telephone number basis for

[1] A rate center, as used here, denotes the smallest geographic area used to distinguish rate boundaries.

assignment to competing service providers participating in local number portability for the purpose of providing services to customers in that area.

3.0 BACKGROUND - THE CONCEPT OF POOLING

The concept of number pooling as an alternative to the current number administration and assignment processes has generated considerable interest as a potential means for the more efficient utilization of numbering resources.

The concept of pooling is mentioned in the Carrier Liaison Committee Industry Carriers Compatibility Forum (CLC ICCF) Routing and Rating Workshop (ICCF Report on Rating and Routing in a Competitive Local Environment - ICCF96-1220-016 - Issued 12/20/96) which suggested that pooling be investigated as an alternative to the various techniques that were evaluated in the ICCF report. Subsequent to this report various pooling type approaches have been suggested by different industry participants. These include the NXX-X/LRN and the pooling of unassigned numbers.

The potential need for and the anticipated advantages of number pooling are described below.

3.1 THE POTENTIAL NEED FOR NUMBER POOLING

The onset of local exchange competition, and in particular the need that under current call rating mechanisms all local exchange carriers require a central office code per rate center, has resulted in the increased incidence of central office code exhaust and the associated need for NPA relief. This situation is compounded by the increasing demand for telephone numbers, fueled by the demand for second lines for both residential and business applications, as well as the use of fax machines, modems, and wireless services. The resulting demand has, in many areas, created a shortage of central office (NXX) codes even if there remains a significant quantity of unassigned line numbers. An alternative to the current number assignment practice which assigns service providers a full central office code (i.e., a block of 10,000 numbers) could offer relief from this condition.

3.2 ANTICIPATED ADVANTAGES OF NUMBER POOLING

Number pooling may promote number conservation and is therefore potentially advantageous. Specifically, the assignment of numbers to service providers in finer granularity than blocks of 10,000 – that is, for example, in blocks of 1000 or by individual telephone number—could afford improved utilization of numbering resources. Further, a, pool of numbers, if available to all providers serving a defined area, need only be large enough to accommodate the collective needs of those providers. Within a pooled environment the total number of NXX codes assigned should be fewer than if a

full NXX code were assigned to each service provider, and the numbering resources should last for a longer period of time.

In addition to providing improved number utilization, number pooling may enhance local service competition by reducing the incentive for customers to select a service provider based solely on the ability of that provider to offer a specific telephone number.

3.3 ACCOMMODATION OF NUMBER POOLING

The potential advantages associated with number pooling cannot be realized without the necessary network, operations, and administrative modifications required to implement the pooling process. The time, effort, and cost associated with these modifications must be recognized and weighed against the potential benefits to be derived before a decision to develop and implement pooling in any one particular geographic area can be made. It is further recognized, however, that specific regulatory directives may demand the implementation of pooling regardless of the perceived cost/benefit considerations.

3.4 APPLICABILITY OF NUMBER POOLING

Although pooling may be considered generally beneficial, its implementation may not prove to be desirable in all areas. The understanding that number pooling will enhance the efficiency of number utilization, and therefore delay the need for area code relief is based upon the belief that current number assignment practices (the assignment of full NXXs per rate center) are inherently inefficient because some NXXs may never achieve optimum utilization levels. There is no doubt that in many, if not most areas, this is indeed the case. It may be, however, that in some environments, perhaps specifically in those which are densely populated and where there is a large demand for communications services, number utilization is quite high and the level of unused numbers within central office codes assigned to any service provider in that area is quite small. In such areas, the benefit provided by number pooling may not be significant. Accordingly, the implementation of pooling may need to be area specific, with deployment only in those areas where the benefit of increased utilization and delayed exhaust exceeds some yet to be determined threshold. In addition, as documented in the CLC Ad Hoc Committee on Short Term NXX Exhaust final report, CMRS providers should not participate in number pooling until such time as they provide LRN LNP. (This is currently scheduled to occur beginning June 30, 1999.) However, CMRS providers must have equal and timely access to numbering resources during this interim period. Since CMRS providers serve a rapidly growing market and typically utilize NXX codes very efficiently, this provision should not significantly reduce the overall benefits of number pooling.

3.5 THE CURRENT USE OF NUMBER POOLING

Individual telephone number pooling is currently used only for the toll free (800/888) numbering resources. Toll free numbers reside in the 800/888 Service Management System (SMS) and are available to all SMS users (i.e., toll free service providers). Users interface with the SMS database system, via either a manual or mechanized process, to interrogate the system to identify spare and reserved numbers for their subscribers. Because the toll free numbering resources are non-geographic, the area of pooling covers most of the NANP area and all numbers are available for service in all areas. Pooling of geographic numbers would demand the definition of areas of pooling and constrain the assignment of given geographic numbers to designated areas.

4.0 THE ATTRIBUTES OF POOLING

The attributes of pooling describe key characteristics or parameters from which different pooling alternatives can be derived. The attributes defined here include level, scope, a
applicable~~pplicable~~ numbering resources, and the type of number inventory.

4.1 LEVEL

The level of pooling refers to the granularity with which numbers are assigned and/or allocated to the service provider. Pooling might be implemented by provisioning blocks of numbers in quantities smaller than the block of 10,000 numbers offered under the current CO Code Assignment Guidelines. Quantities that might be considered include 1000s blocks or 100s blocks. It is assumed that block assignments will provide numbers in sequential order. That is, a service provider who is assigned the “2000s” block within a given NXX code would receive the numbers 2000 through 2999.

Pooling may also provide service providers the capability to request the assignment and/or allocation of numbers at the individual telephone number t level. With this level of pooling, service providers would be able to request one or more numbers at a time. Individual telephone number pooling, although oriented to the random selection of numbers, could support the assignment of a group of sequential numbers if available.

4.2 SCOPE

The scope of pooling defines the geographic area within which the pooling of numbers is supported. Initially, the area of pooling is confined to within a rate center. This will permit current wireline call rating mechanisms to be maintained. Limiting pooling to within a rate center would maintain the current association of telephone numbers – specifically, the NXX code – with a known, given geographic area (i.e., rate center).

It is possible, however, that an area of pooling could extend beyond a single rate center. In general, increasing the area of pooling offers the ability to serve more end user customers with the numbering resources within the pool and could potentially increase number utilization. Implementation of pooling beyond a rate center boundary would require additional capabilities to properly rate the call, specifically the capability associated with the implementation of number portability out of the rate center. With pooling out of the rate center, additional questions regarding the absolute extent of the area of pooling must be addressed. The area of pooling could extend beyond a rate center but still be within an NPA boundary; or the area of pooling could conceivably comprise an entire state. ~~It is not contemplated that the area of pooling would extend beyond a state boundary.~~ The maximum geographic scope to be considered at this time (August, 1997) is state-wide, except in situations involving unique calling patterns across state lines, for example Kansas City or the New York Metropolitan area.[2] The future scope of pooling outside the rate center will be determined when the INC undertakes its analysis of pooling outside the rate center. Limiting number pooling to state boundaries does not address the responsibility and ability of CMRS providers to serve multiple states with a single network.

4.3 NUMBERING RESOURCES SUBJECT TO POOLING

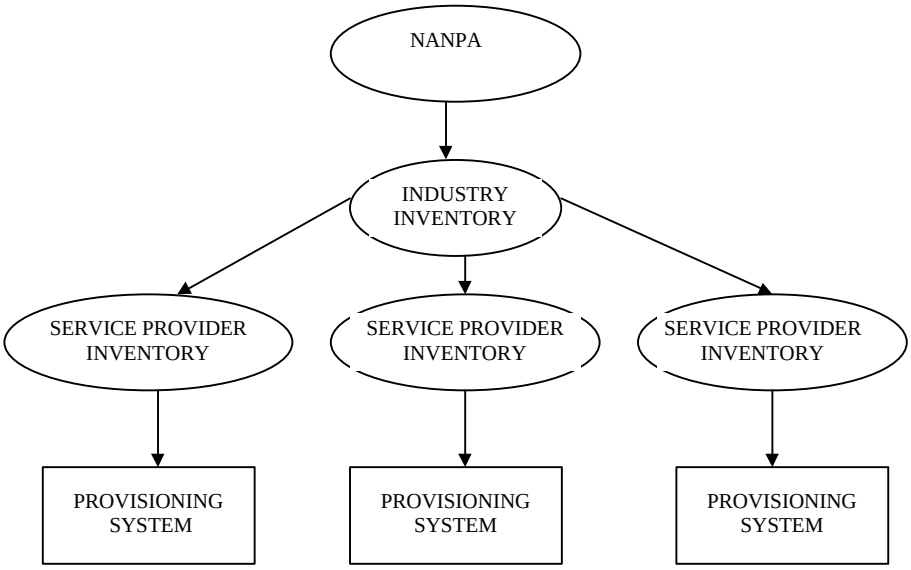
The initial establishment of a numbering pool could include only growth numbers -- that is, numbers in unassigned NXX codes; or, it could include embedded numbers (subject to the possibility of a threshold, yet to be determined) -- that is, numbers from NXX codes previously assigned to a given service provider; or both. For example, if pooling were implemented with 1000s block assignments, the pool would be populated with all 1000s blocks from unassigned NXX codes. However, it is certainly feasible that the pool could also contain 1000s blocks from NXXs allocated to service providers but in which there were no end user assignments. It is also possible that even those 1000s blocks within an NXX code allocated to a given service provider which have a minimal number of end user assignments (yet to be determined) could be allocated to another service provider.

If individual telephone number pooling were implemented, similar considerations relative to growth and embedded numbers would have to be addressed. The establishment of the industry inventory pool would no doubt contain numbers from unassigned NXX codes but could also include numbers from allocated NXXs.

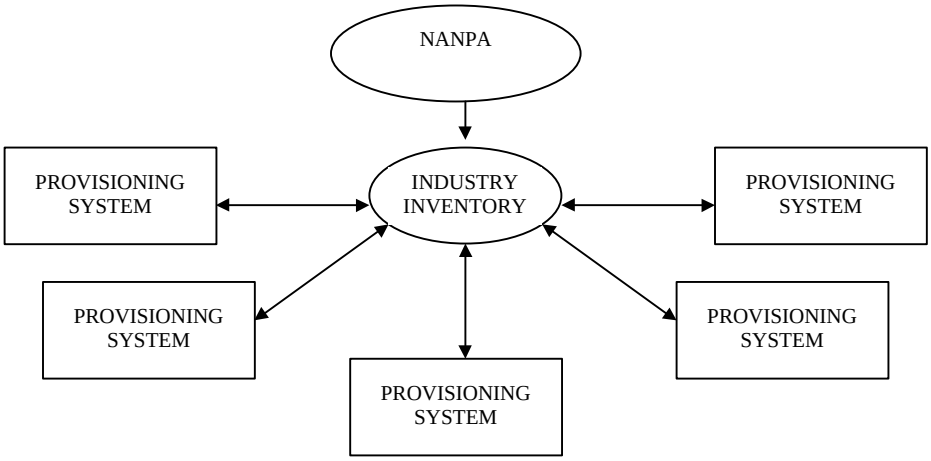
[2] August 27, 1997 NANC letter

4.4 NUMBER INVENTORY

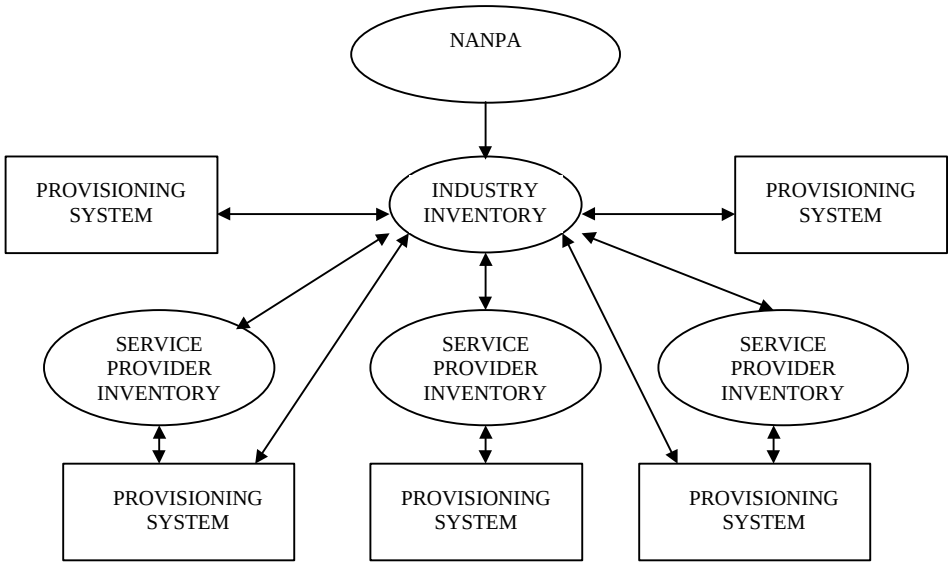
Numbers assigned to a given service provider can be placed in an inventory maintained by that service provider (Service Provider Inventory) and subsequently assigned from that inventory to end users. This is what is done today after an NXX code is assigned to a service provider. A pictorial representation of number pooling with the use of service provider inventories is shown below.



Alternatively, it is possible that a service provider would not maintain its own inventory but use only an industry inventory, which the service provider would access to search for and obtain assignments based upon specific end user requests for service. The use of an industry inventory is represented below.



Scenarios for number pooling will therefore be classified as supporting a *service provider inventory* of numbers or an *industry inventory* of numbers, or a combination of both. The figure below represents a pooled environment where assignments could be populated in service provider inventories or service provider provisioning systems might interact directly with the industry pool.



Numbers can be made available to a given service provider using either a batch process or a real time/interactive process. A batch assignment is associated with a specific request for resources based upon a service provider forecast, and the allocation of those resources to a service provider for subsequent assignment to subscribers. The real time process implies the assignment of numbers based upon a specific subscriber need and the immediate assignment of the resource to the subscriber.

The use of a service provider inventory could be associated with either a batch or real time assignment mechanism. A number pooling scenario which allocates numbers by 1000s blocks would support a batch process through which the 1000s block is provided to the service provider's inventory, from which future subscriber assignments can be made. Real time assignments could also be made from the pool to a service provider's inventory to satisfy the demand of a given subscriber, either for an individual number or a block of numbers. Alternatively, a scenario which does not include service provider inventories, but relies on the use of an industry inventory, would only be associated with real time assignments.

5.0 GENERAL AREAS OF IMPACT

Number pooling represents a major change in number assignment and administration. Its impact, however, extends beyond these areas and requires modifications to network infrastructure, changes in operations support systems, and variations in call processing, including call routing and rating.

5.1 ROUTING

Historical network routing mechanisms are based upon the understanding that geographic numbers are assigned on a central office (NXX) basis and associated with a specific switch, and the recognition that the network address to which the call must be routed is embedded in the first six digits (NPA-NXX) of the called number. The use of number pooling eliminates this association of NXX to end office and demands an alternative routing mechanism for call completion. Such a mechanism is provided with the infrastructure associated with Location Routing Number (LRN) Local Number Portability (LNP). Accordingly, and most importantly, any implementation of pooling can only be supported if permanent LRN LNP is available.[3] The current implementation of this capability will only support pooling within the rate center.

Similarly, non-call associated signaling messages associated with database (e.g., LIDB or HLR) queries, or the processing of certain CLASS services, are traditionally routed using six digit analysis of a designated telephone number. Again, number pooling breaks the association of NPA-NXX with the required destination and demands more granular analysis and (global title) translations. The mechanisms available with LRN LNP also provide this capability.

5.2 RATING

Today call rating is derived from the geographic information embedded in the calling and called party numbers, specifically the first six digits of those numbers (the NPA-NXX). The use of number pooling supports these rating mechanisms assuming that the area of pooling -- that is, the area in which numbers are assigned and shared among different service providers -- is consistent with the established rate center boundaries,

[3] Although switch based seven digit analysis and translation can conceivably be supported in many switches and could, therefore, be used to route calls in some pooled number environments, it is the consensus of the industry that this capability as administratively burdensome and inefficient in its use of switch memory. Therefore, seven digit analysis is not a practical routing alternative using the mechanisms of LNP.

and that the NPA-NXX(s) assigned to the pool uniquely identify the rate center in which subscribers assigned numbers reside.[4]

If an area of pooling is defined that extends beyond existing rate center boundaries and numbers from a given NPA-NXX can be assigned over multiple rate centers, an alternative to the current call rating mechanisms would be required to accommodate changes to billing structures. This mechanism, which is not now available, may associate rating information with a given 10 digit number (i.e., the subscriber), perhaps through the use of a separate, additional location parameter. This location information may be provided in call detail records and used in downstream rating processes.

5.3 THE REQUIRED INFRASTRUCTURE

The use of number pooling will require the development and deployment of the necessary network infrastructure. Specific architectural issues include whether the number administration database will be used simply as a repository of number assignments or will function on an immediate basis, allowing service providers to search for and reserve numbers as a result of a specific customer request.

In addition, it appears that routing requirements demand close coordination between the number assignment process and the Service Management System (SMS) associated with LRN LNP. Accordingly, this may require a link between the number administration database and the LNP SMS. Upon the allocation of numbering resources within the number administration database, or perhaps later when a specific subscriber assignment is made, a record associating the assigned number with the appropriate service provider, along with routing information necessary to direct any calls dialed with that number to the designated central office switch, would be transmitted to the LNP SMS. Information in the LNP SMS would be downloaded to the network routing databases (SCPs) and thereby made available for call processing.

Finally, it is recognized that the architecture associated with pooling is directly related to the process flows which will be used in the number assignment process. These process flows will be dependent on the specific implementation of the number administration database and the possible use of service provider inventories. Specific number pooling architecture proposals and their associated number assignment process flows are described in Section 7.0.

5.4 ADMINISTRATION

[4] The assignment of numbers to subscribers who reside in the rate center to which a given NPA-NXX is assigned is a wireline service provider paradigm. It should be recognized that wireless service providers typically are not constrained to this assignment procedure and may assign numbers to their subscribers from a given NPA-NXX even if those subscribers reside outside the rate center with which the NPA-NXX is associated.

As is the case with all number administration processes, number pooling will require the oversight of an administrator to establish the pool, allocate the resources from the pool, monitor the utilization of the pool, determine the rate of growth, determine its projected exhaust, and plan for its relief in accordance with industry guidelines. It is expected that a neutral third party will perform this function. Administration of the resources will be subject to regulatory oversight. A detailed description of number administration in a pooled environment is given in Section 10.0.

5.5 ADMINISTRATIVE AND ASSIGNMENT GUIDELINES

Guidelines will be required to describe the specific methods and procedures through which numbers will be assigned in a number pooling environment. The manner in which numbers are allocated, reserved, aged, or designated spare must be determined. Further, limitations on the quantity of numbers that may be reserved at any one time by a given service provider must be considered. Definitions and practices related to number assignment in a pooled environment are provided in Section 8.0.

5.6 OPERATIONS SUPPORT SYSTEMS

Operations Support Systems (OSSs), especially those associated with service provisioning, will be directly impacted by the implementation and use of number pooling. Systems which provision new services for customers are typically based upon the availability of numbering resources within a central office code (block of 10,000 numbers) and will have to be modified and, in some cases, possibly replaced to accommodate number pooling. Other OSSs used for maintenance and repair are similarly configured and may also require modification. It is recognized that some of the necessary modifications may have been made to accommodate LNP. The extent that additional changes may be needed to support number pooling is described in Section 9.0. It is also recognized that in some cases new system(s) may need to be developed and deployed to accommodate number pooling.

5.7 CAPACITY

Number pooling will increase the quantity of numbers treated as ported numbers. This increases the storage requirements for LNP databases and billing systems, and increases SSP real-time processing and 10-digit Global Title Translations (GTT). Additional details concerning SCP capacity are provided in Section 7.2.4.3.

6.0 PRINCIPLES, ASSUMPTIONS, AND CONSTRAINTS

The following principles, assumptions, and constraints form the framework from which number pooling can be implemented in a fair and equitable manner that does not disadvantage any LNP capable local service provider from competing in the pooling area.

6.1 PRINCIPLES

Number pooling shall be implemented under the following principles. It is recognized that considerations involving 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 very important. Any solution should not preclude the development of appropriate cost recovery mechanisms. However, such considerations are not included in these principles.

6.1.1 Number Pooling Availability Principle

Number pooling can only be implemented in locations where local number portability has been implemented and by entities which have implemented LRN LNP. ~~Specifically, number pooling will only be implemented where LRN LNP is available.~~

6.1.2 Reciprocity Principle

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

The introduction of number pooling should not disadvantage any industry segment to a degree greater than any other. Thus, carriers who are not obligated via Section 6.1.3 (Participation Principle) to participate in number pooling must have the opportunity to obtain usable numbering resources from the same NPA numbering resource as those carriers who participate in number pooling.

6.1.3 Participation Principle

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 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.

6.1.4 Non-participation Principle

Service providers should not be required to participate in number pooling before they are required to offer local number portability. Number pooling should not preclude such service providers from obtaining usable non-pooled geographic numbering resources.

6.1.5 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.

6.1.6 Architectural Flexibility Principle

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

6.1.7 Customer Transparency Principle

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

6.1.8 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.

6.1.9 Network Reliability Principle

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

6.1.10 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.

6.1.11 Uniform Interface Principle

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

6.2 ASSUMPTIONS AND CONSTRAINTS

- Number pooling will not be implemented until a neutral number pooling administrator is in place and able to perform the number administration function.

- Number pooling will not be industry segment specific. Although there may be additional considerations unique to particular segments of the industry, number pooling must be available to all carriers.

- Initially, each number pooling area will be constrained to within a rate center boundary. This does not presume that the use of number pooling will ultimately be limited to existing rate center boundaries.

- The current wireline call rating paradigm, in which call rating for wireline carriers is based upon the rate centers associated with the calling and called party, will be maintained.

- Implementation of number pooling will be subject to applicable local, state and federal regulatory requirements.

7.0 FUNCTIONAL CONSIDERATIONS

A number pooling environment must support several basic functions/processes necessary for number assignment and administration. These include the administration of the number pool, the interaction of that pool with the LNP SMS, and, in general, accommodation of the "life cycle" of the numbering resources, from the initial availability of numbers within the pool, through their assignment, activation, disconnection and return (snapback). Architectural considerations and related process flows necessary for the support of these functions are described for the two distinct forms of pooling – block pooling and individual telephone number pooling.

7.1 Functions Required in a Number Pooling Environment

The functions of 1) industry inventory administration, 2) LNP administration, 3) CO code administration, and 4) service provider inventory administration are described in the following sections. These descriptions and the associated process flows are functional and present a basis for architectural considerations. However, within this

Section, no attempt is made to identify the specific system (e.g., database) where these functions may reside.

7.1.1 Industry Inventory Administration

The industry inventory pool is the reservoir of numbers from which service providers will be allocated numbers. This pool will be overseen by an administrator whose responsibilities will include the establishment of the pool and the ongoing assurance that number allocation is made consistent with industry guidelines so that the industry inventory pool contains sufficient resources to satisfy industry needs.

7.1.2 LNP Administration

LNP, as previously stated, is a requirement for the implementation of number pooling. Because the mechanisms associated with LNP will be used to route pooled numbers, the LNP SMS must be directly involved in the pooling process. The manner in which information is transmitted from the industry inventory pool to the LNP SMS is a key item in the pooling process and is discussed further in Section 7.2.4. The LNP SMS will be overseen by the Number Portability Administration Center (NPAC) and its Administrator.

7.1.3 CO Code Administration

CO code administration, in some form, will continue to be necessary with number pooling. The CO code administrator, upon request of the pool administrator, will make available additional CO codes for the pool. The CO code administrator will also continue to be responsible for the tracking of CO code usage, the forecast of CO code exhaust, and the planning for NPA relief. Finally, there may be service providers who, because of technical or other considerations (e.g., lack of LNP capability, pooling may not be required in a specific area), will not participate in pooling and will continue to be assigned full CO codes for their numbering needs. These service providers will likely continue to interface with the CO code administrator.

7.1.4 Service Provider Inventory Administration

A service provider may be required to maintain or have access to a service provider inventory of numbers from which it will make assignments to its subscribers as necessary.[5] This service provider inventory of numbers will be supplied from the industry inventory consistent with the prescribed pooling arrangement and industry

[5] Although it is likely that most service providers will maintain their own inventory of numbers, it is possible that a service provider may choose to employ the services of another service provider, or perhaps a third party database provider, for the maintenance of its inventory of numbers.

assignment guidelines. Each service provider will be responsible for the administration of its own inventory.

7.1.5 Additional Required Functional Capabilities

The infrastructure deployed to support pooling, regardless of whether the implementation provides for block or line level pooling, must accommodate the following needs:

- the ability to query the industry inventory pool to determine what resources are available for allocation
- the ability of the pool administrator to obtain information relevant to the utilization of the allocated resources in service provider inventories for auditing and/or reclamation purposes
- the availability within the industry inventory pool of information regarding all assignable resources as well as whether those resources have been allocated, and to whom
- the availability within service provider inventories of specific information regarding the status of individual telephone numbers (e.g., spare, working, reserved, intercepted, etc.)

7.2 ARCHITECTURE AND PROCESS FLOWS - BLOCK POOLING

The key parameters of block pooling are described. They include the characteristics of the pool, the manner in which assignments are made from the pool, the industry documentation required, the provision of information to the NPAC/SMS, and the treatment of disconnected numbers.

7.2.1 Characteristics of the Industry Inventory Pool

Within a block pooling environment the industry inventory pool of numbering resources will provide blocks of numbers (e.g., 1000s blocks) for allocation to eligible service providers. The pool will provide these numbering resources for use in a specific geographic area – the area of pooling – initially to be associated with a rate center. Accordingly, service providers which are allocated numbers from a given industry inventory pool will assign those numbers to subscribers who reside in or choose to obtain service in the area of pooling.[6]

Blocks of numbers may be allocated to the industry inventory pool from CO codes not assigned to any service provider. In addition, blocks of numbers may be allocated to

[6] As previously described, wireless providers may provide their subscribers number assignments associated with a given rate center even if those subscribers reside outside that rate center.

the pool from CO codes assigned to service providers but in which there exist no subscribers within six months of the assignment. It is also possible that blocks from CO codes assigned to a given service provider which contain a minimal number of subscriber assignments might also be placed in the industry inventory pool. These "contaminated" blocks could be assigned to a service provider other than the service provider assigned the CO code with calls to the existing subscribers properly routed through use of the mechanisms of LRN LNP. Specific guidelines (e.g., % fill) to determine the eligibility and the exceptions of a given block for placement in the industry inventory pool will have to be developed.

7.2.2 Assignments from the Industry Inventory Pool

A service provider will request an assignment from a given industry inventory pool consistent with its needs for numbering resources in the area of pooling and the industry assignment guidelines. These guidelines will describe the parameters under which such a request can be made and could include, for example, the percent utilization of the service provider's current inventory of numbers, or the months remaining before that inventory exhausts.

Assignments of blocks of numbers will likely be made using a procedure through which a service provider will request the block assignment based upon its forecasted need. Upon assignment, the block will be populated in the service provider's inventory for assignment to individual subscribers.

The pool administrator will make the block assignment based upon certification by the service provider that its request is consistent with the assignment guidelines. On an ongoing basis the pool administrator will monitor the supply of numbering resources within the pool to assure an adequate supply of numbers for the participants within the pool. If that supply is not adequate, the pool administrator will request from the CO code administrator that additional resources (i.e., a new CO code) be made available to the pool. The CO code Administrator will supply a new CO code for use in the pool consistent with industry administrative guidelines.

7.2.3 Industry Documentation

Currently, CO code assignments are documented in the Local Exchange Routing Guide (LERG) where the information is available to the industry for routing purposes.[7] LERG assignment on a CO code basis will continue to be necessary in a pooled environment.

[7] NPA-NXX assignment information is also documented in NECA FCC Tariff No. 4.

A LERG designated CO code assignee will provide default routing if routing information is unavailable or inaccessible from an LNP routing database.[8]

The Pooling Administrator will select the LERG Assignee for newly assigned CO Codes in accordance with the industry pooling administration guidelines. The LERG Assignee should be a qualified code applicant providing service in the rate center to which the NXX is assigned. In no case should a non-LRN LNP capable network be the LERG NXX assignee for pooled NXXs.

7.2.4 Provision of Information to the NPAC/SMS

The use of block level pooling raises the issue of the manner in which information related to a block assignment will be provided to the NPAC/SMS. As previously discussed, the provision of the assignment in the NPAC/SMS is essential for accurate call routing. Two potential methods have been identified for the transfer of this information. The first method would, immediately upon the assignment, place all numbers within the block into the NPAC/SMS thereby creating a record for each line number to associate that number with an LRN. Alternatively, information relative to each line number might be provided to the NPAC/SMS only when a line number was assigned to a subscriber. The former arrangement has been identified as “pre-porting”; the latter as “port on demand”. Not surprisingly, each method has characteristics that might be viewed as either advantages or disadvantages. The characteristics of the methods are described below.

7.2.4.1 Characteristics of Pre-Porting

The following is a list of characteristics associated with pre-porting:

a) porting performed once upon block assignment (if service provider maintains only a single switch in the area of pooling);
b) vacant treatment and billing/fraud obligation associated with block holder;
c) no porting delay on assignment; numbers already ported into network;
d) numbers within pooled blocks can be administered in the same manner as those within resident (DEFINE) NXXs;
e) eliminates a concern for potential overload of NPAC transaction capacity; and
f) requires larger LNP databases; potential capacity concerns.

7.2.4.2 Characteristics of Port on Demand

[8] Modifications are currently being considered which would support the association within the LERG of less than a full NXX code (e.g., a range of numbers such as a 1000s block) with a given service provider. Although the availability of this more detailed information is welcome, the need to accommodate default routing continues to demand the designation of a single (default) service provider for each NPA-NXX.

The following is a list of characteristics associated with port on demand:

a) uses smaller LNP database (only numbers assigned to subscribers are ported);
b) vacant numbers are default routed to code holder, not the block holder;
c) must use LNP porting process upon each subscriber assignment; adds potential complexity and delay;
d) presents risk that numbers in block allocated to a given service provider could (inappropriately) be used by the code holder; ~~and~~
e) ambiguity of billing and fraud obligations (LIDB validation and CMRS mobility management); ~~.~~ and
f) customer would not be able to receive calls until 15 minutes after service activation.

7.2.4.3 SCP Capacity Concerns

Arrangements have been proposed to minimize concerns associated with database capacity (that is, the need to accommodate the added number of records that would be stored in LNP SCPs as a result of number pooling). These arrangements suggest that a range or block of numbers allocated to a given service provider need not be represented in databases as individual records, but could instead be identified as a single record.

Two specific proposals have been offered. The first would provide separate tables for storing both individual (ported) numbers and sequential ranges. The second proposal incorporates an algorithm change which would be implemented as part of the query process to perform a second search after the initial query associated with a single number did not locate a specific record. Although it is generally agreed that both arrangements have merit, it is also understood that because of differences in provisioning requirements the two alternatives could not co-exist in the same area.

The first proposal suggests that an LNP query would be routed through two database tables: one in which a record represents a single ported number, and one in which the record represents an entire range of numbers. The first table is actually an exception table, containing only those numbers that cannot be represented in a range. Such numbers would include those ported for service provider portability purposes only (i.e., not ported for pooling) or numbers that have been ported away from the range holder. With this arrangement the query would first initiate a search of the exception table – the table that contains records of individual number – and, if the appropriate record was not found, initiate a search of the range table. Implementation of this arrangement would likely require modifications to the current NPAC interface.

The second proposal suggests a change in the manner in which the range is identified and submitted to the NPAC SMS. Specifically, the range record would be encoded in an entry that maintains the format of a single number record, but uses unique digits to identify the record as representing a range of numbers. Importantly, it appears that this method could only be used to accommodate the allocation of a 1000s block. The associated query process would require an initial search of the LNP database and, if a record for the individual telephone number were not found, specific digit reformatting of the queried number would also be required. This reformatting would place the number in the unique format of the range record and a second search of the database would be initiated. No change in the NPAC interface is required with this arrangement.

7.2.4.4 Proposed Target Implementation

The INC recommends a target implementation no later than the first half 1999 for thousands block number pooling which does not require the exclusive use of either pre-port or port-on-demand. Subject to further industry analysis to determine technical feasibility, the INC recommends an implementation procedure which would provide carriers the flexibility to activate their allocated numbers (i.e., 1000s blocks) consistent with their needs. Numbers could be activated (i.e., records placed in the LNP/SMS) immediately upon allocation, only when assigned to subscribers, or anytime in between.

The target implementation requires significant development effort, not all of which has been completely identified. Further examination of this proposal should be undertaken by the LNPA Working Group. The areas of development identified to date are listed below.

1. Modification to NPAC/SMS which permits activation of pooled number records in the SMS and associated downloads to LNP SCPs within a 15 minute interval; and development of a pooled number indicator.

2. Modifications to Service Provider OSSs which permits the mechanized provisioning and TN administration for 1000s blocks

3. Modifications to Service Provider Switches and Switch Administration to permit the automation of the translations activities required for vacant number treatment of pooled numbers

4. SMSs, SCPs, NPAC and associated interfaces require modification to permit the representation of a range of numbers in the SMS and SCPs, rather that the exclusive use of individual records, i.e., Efficient Data Representation.

The time frametimeframe for the development associated with these capabilities is presently unknown, but the capabilities are required no later than 2Q99 to meet CMRS needs.

If the NANC endorses this INC recommendation, the NANC should immediately direct the LNPA Working Group to undertake a detailed analysis of the specific requirements to support the target implementation.

Prior to the availability of all the capabilities to support the target implementation, number pooling might be implemented in specific areas with some, but not all of the above features.

The time framestimeframes depicted below are based on the October 1997 vendor responses to the Illinois Commerce Commission analysis regarding number pooling in the 847 NPA. The analysis assumed pre-port, 1000 block pooling with snapback to the block holder. These time framestimeframes are based on limited vendor input and should only be considered as preliminary estimates which are subject to change.

Based on current understanding, early implementation of number pooling would be constrained as follows:

Implementation prior to mid 1998
1. Service Providers activate “as needed” (see definition below) pursuant to industry guidelines.
2. Manual processes needed by some service providers
3. Service Provider concerns due to potential 3 day interval (delay) for activation (porting)
4. Service Provider/Vendor SCP capacity limitations

Implementation mid 1998 - end 1998
1. Service Providers activate “as needed” pursuant to industry guidelines
2. Potential mechanized capabilities used for provisioning, TN administration
3. NPAC/SMS development permits 15 minute activation
4. SCP capacity limitations continue

Implementation no later than first half 1999 (target implementation)
1. Efficient data representation developed; SCP capacity limitations are potentially resolved
2. Service Providers activate at their discretion

Definition of Activation “As Needed”

Activation ”as needed” is a number administration process which would permit a service provider to immediately activate a portion of the numbers within its allocated

thousands blocks subject to limitations defined in yet to be developed industry guidelines. That is, a carrier might be constrained to activate, for example, only the amount of numbers within its allocated thousands blocks that a service provider requires to satisfy its forecasted needs for the near term, e.g., one month. This process could mitigate some SCP capacity concerns while still providing carriers with an inventory of numbers from which subscribers could be assigned numbers without a three day delay. Until efficient data representation is available, it should be recognized that control mechanisms should be implemented by service providers to monitor their own SCP capacity utilization to ensure adequate capacity for both number portability and number pooling.

7.2.5 Treatment Upon Disconnect

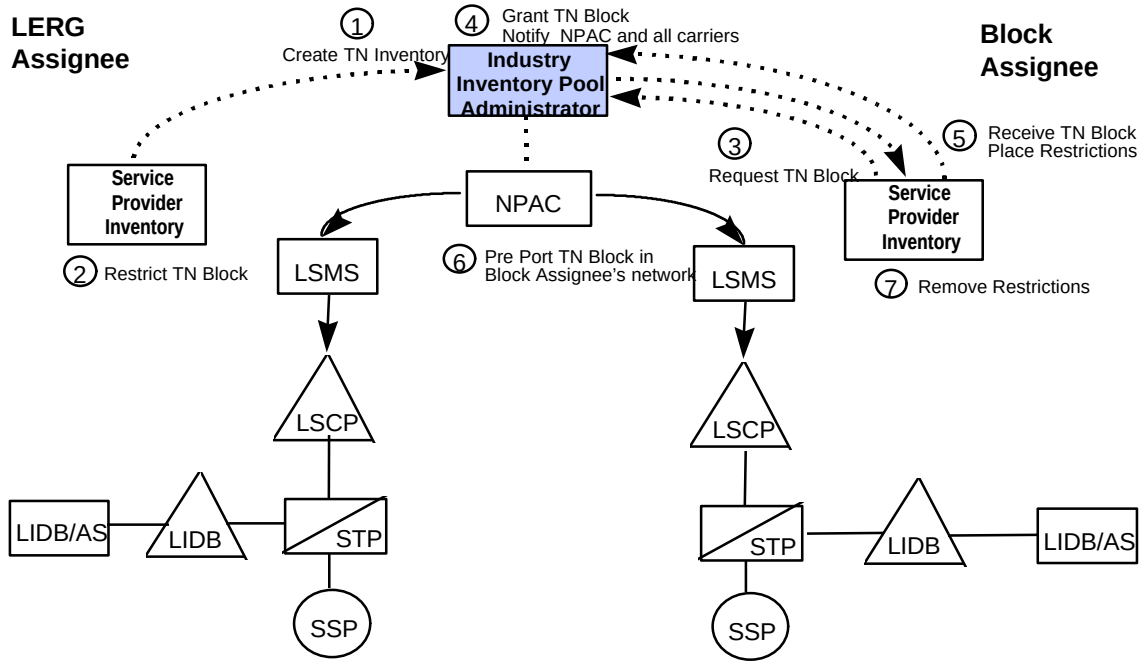
Within a block pooling environment, careful attention must be given to the manner in which numbers are administered upon disconnect. Of particular concern is whether a number, when disconnected, should be returned (or snapped back) to the block holder, the code holder (i.e., the LERG assignee), the industry inventory pool, or remain with the disconnecting service provider.

The INC recommends that within a thousands block pooling environment, snapback to the block holder is the preferred scenario, but recognizes that early deployment of number pooling will generate situations where snapback to the code holder may occur.

7.2.6 Schematic Representation of Process Flows for Block Pooling

BLOCK POOLING - OVERVIEW

The following figure depicts the process flows associated with number assignment in a general block pooling environment.



1. Industry Inventory Pool Administrator creates and maintains inventory of NXX-X TN blocks from growth (and embedded) NXXs necessary to satisfy forecasted demand. LERG assignees need to be identified for new NXXs. (Under existing procedures this is a 66 day process).

2. If necessary, LERG Assignee restricts TN block from selection/assignment in their Service Provider Inventory System(s). (Note: LERG Assignee is still required to perform vacant number treatment for unallocated numbers.).

3. Service Provider requests a TN(s) block from the Industry Inventory Pool Administrator.

4. Industry Inventory Pool Administrator forwards TN(s) block to Service Provider. (Assumption: An agreed upon date is set as to when Service Provider controls TNs). Industry Inventory Pool Administrator notifies NPAC and all carriers of pending TN assignments.

5. Service Provider loads TN(s) block into their Service Provider Inventory System(s) and restricts selection/assignment until Service Provider specified agreed until it is activated in the network.

6. The Service Provider, after receipt of the allocation, forwards an LNP Local Service Request (LSR)[9] to the NPAC to begin the actual activation process. Existing confirmation and activation message flows will prevail.

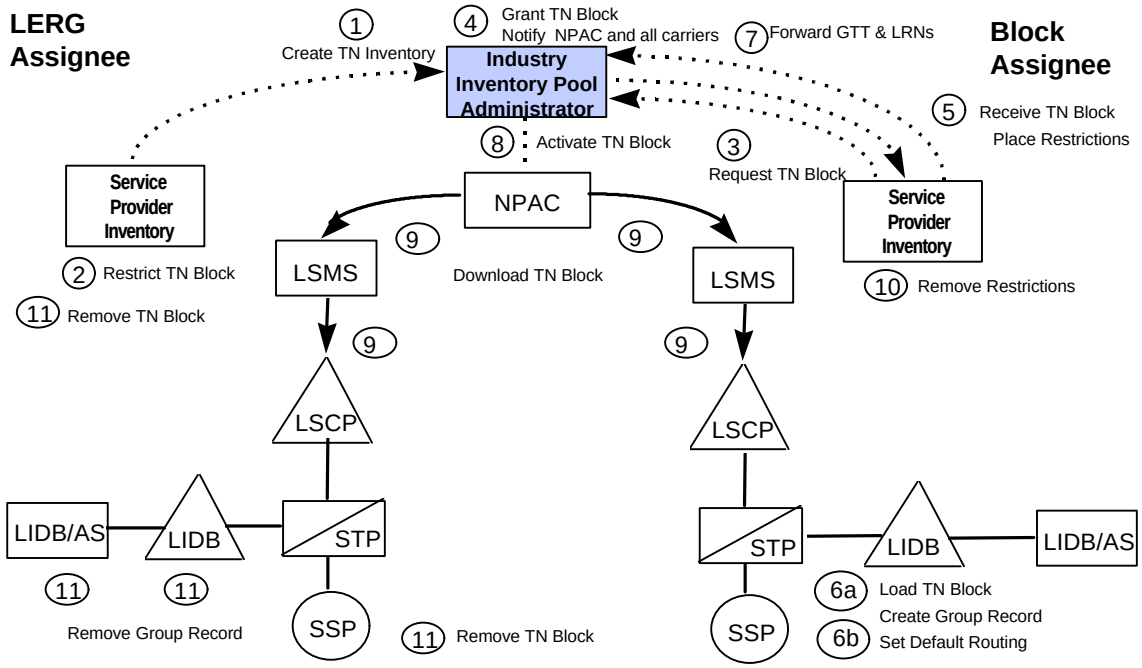
7. Service Provider removes date restrictions from their Service Provider Inventory System(s) and allows selection/assignment on TN(s).

Additional Assumptions:

- NPAC must keep track of owner of TN block.

BLOCK POOLING - PRE-PORTING FLOW

The following figure depicts the process flows associated with number assignment in a block pooling, pre-porting environment.



1. Industry Inventory Pool Administrator creates and maintain inventory of NXX-X TN blocks from growth (and embedded) NXXs necessary to satisfy forecasted demand. LERG assignees need to be identified for new NXXs. (Under existing procedures this is a 66 day process).

[9] This may require single or multiple orders dependent upon the methodology employed (Pre-porting or Porting On Demand.)

2. If necessary, LERG Assignee restricts TN block from selection/assignment in their Service Provider Inventory System(s). (Note: LERG Assignee is still required to perform vacant number treatment for each unallocated NXX.).

3. Service Provider requests a TN block from the Industry Inventory Pool Administrator.

4. Industry Inventory Pool Administrator forwards TN block to Service Provider (now referred to as the Block Holder). (Assumption: An agreed upon date is set as to when Block Holder controls TNs). Industry Inventory Pool Administrator notifies NPAC and all carriers of pending TN block assignment to Block Holder. (This assumes the existing LERG assignment processes whereby all carriers are notified when an NXX is assigned).

5. Block Holder loads TN block into their Service Provider Inventory System(s) and restricts selection/assignment until Service Provider specified date.

6. Block Holder loads default routing data:

   a) loads TN block into SSP and creates group record in LIDB and LIDB/AS if the block holder utilizes or provides LIDB functionality,
   b) loads default routing data in both STPs and SSPs and
   c) establishes vacant code announcements, etc. in the SSP.

7. Block Holder provides LSR with Global Title Translations (GTT) and LRN(s) to NPAC, who verifies block ownership and processes order.

8. Upon the Service Provider specified date, NPAC activates TN block by sending an LSR to the NPAC. (Currently this process requires 3 days.)

9. NPAC downloads TN block into SCPs via LSMSs.

10. Block Holder removes date restrictions from their Service Provider Inventory System(s) and allows selection/assignment from TN block. Numbers can be activated as quickly as the OSSs can accommodate new subscribers .

11. If necessary, LERG Assignee removes TN block from their Service Provider Inventory System(s), ~~and~~ TN block from their SSP, and records from their LIDB and other databases. LERG Assignee removes group record from LIDB and LIDB/AS.

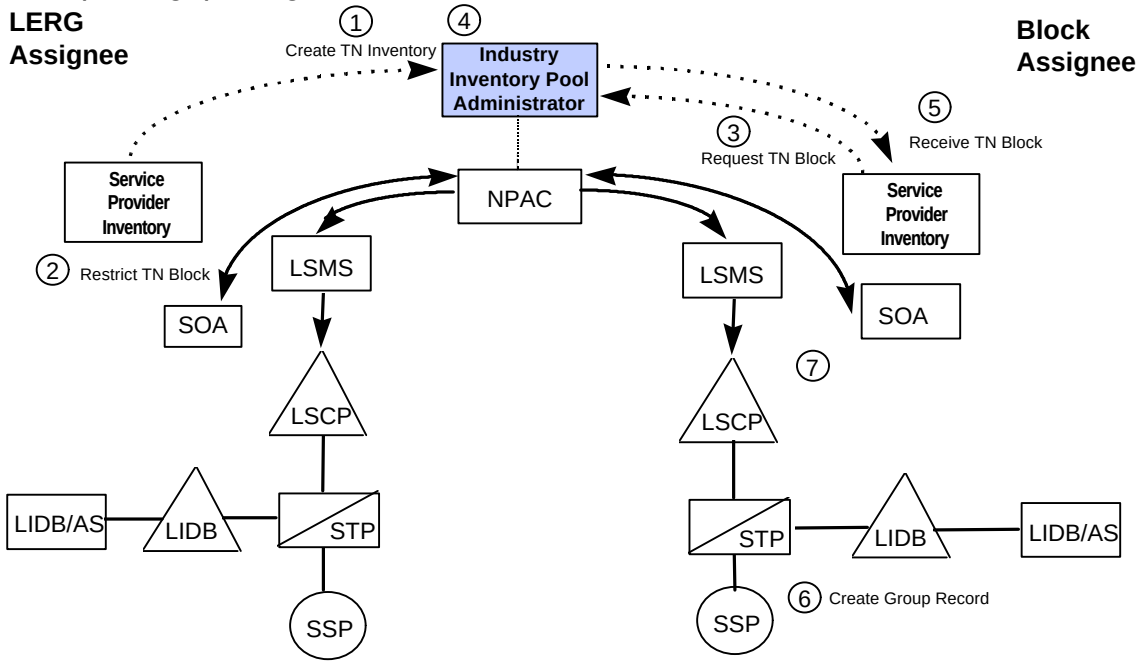
Additional Assumptions:

- NPAC must keep track of owner of TN block.
- Block Holder is responsible for vacant code treatment on non-working numbers.

- LERG Assignee is still required to perform vacant number treatment for each unallocated NXX block.

BLOCK POOLING - PORT ON DEMAND FLOW

The following figure depicts the process flows associated with number assignment in a block pooling, porting on demand environment.



1. Industry Inventory Pool Administrator creates and maintain inventory of NXX-X TN blocks from growth (and embedded) NXXs necessary to satisfy forecasted demand. LERG assignees need to be identified for new NXXs. (Under existing procedures this is a 66 day process)

2. If necessary, LERG Assignee restricts TN block from selection/assignment in their Service Provider Inventory System(s). (Note: LERG Assignee is still required to perform vacant number treatment for each unallocated NXX.).

3. Service Provider requests a TN block from the Industry Inventory Pool Administrator.

4. Industry Inventory Pool Administrator forwards TN block to Service Provider (now referred to as the Block Holder). Industry Inventory Pool Administrator notifies NPAC and all carriers of TN block assignment to Block Holder. (This assumes the existing processes whereby all carriers are notified when an NXX is assigned).

5. Block Holder loads TN block into their Service Provider Inventory system.

6. Block Holder creates group record in LIDB and LIDB/AS if the block holder utilizes or provides LIDB functionality:

   a) creates TN block into record in LIDB and LIDB/AS, if required by the block holder,
   b) opens allocated TN blocks in SSPs and
   c) assures that all unallocated numbers are given unallocated treatment.

7. As Customers in TN block request service, service provider must have a means of identifying that these numbers require LNP treatment . LNP flow for service activation starts by sending an LSR to the NPAC. (3 day process based on existing procedures):[10]

   a) Block Holder provides Global Title Translations (GTT) and LRN(s) to NPAC and
   b) NPAC downloads TN into SCPs via LSMSs using standard LNP flows.

Additional Assumptions:

- NPAC must keep track of owner of TN block.
- LERG Assignee is responsible for vacant number treatment.

7.3 ARCHITECTURE AND PROCESS FLOWS - INDIVIDUAL TELEPHONE NUMBER POOLING

7.3.1 Characteristics of the Industry Inventory Pool

Individual telephone number pooling places telephone numbers in an industry inventory pool and provides service providers participating in the pool the capability to request variable quantities of numbers consistent with industry assignment guidelines. The numbers within a given pool will be designated for allocation to service providers who choose to provide service to their subscribers from the rate center covered by the pool.

The source for telephone numbers placed in the industry inventory pool could be from unassigned CO codes. In addition, spare TNs from existing, assigned CO codes could also be designated for placement in the pool. Specific guidelines for selection of TNs from assigned CO codes for use in the pool will have to be determined.

7.3.2 Assignments from the Industry Inventory Pool

[10] Proposals have been made to the industry that would reduce this interval.

As with block pooling, requests by a service provider for assignments from an industry inventory pool will be made consistent with that service provider's needs and industry assignment guidelines.

Numbers might be obtained by the service provider using a process in which assignments are requested based upon a general forecasted need, and numbers allocated to the service provider's inventory for subsequent assignment to subscribers.

A service provider may also choose to interact with the industry inventory pool to obtain numbers specifically to meet the demands of given subscribers and to accommodate the need for the immediate or near term assignment of numbers to those subscribers. With this type interaction with the industry inventory a service provider might employ its own number inventory from which it makes its assignments to subscribers, or possibly use only the industry inventory (pool) with which it would establish an interface with its Operations Support Systems (OSSs) for service provisioning.

The use of individual telephone number pooling with direct interaction to an industry inventory pool would require specific assignment guidelines. This would discourage the misuse of the assignment process and minimize the possibility of number hoarding.

Finally, as with block pooling, the pool administrator will be responsible for tracking the supply of numbers in the pool, and assuring the supply of numbers is adequate for the participant's needs.

7.3.3 Industry Documentation

Designation of a service provider as the LERG assignee of a given CO code is again required. As with block pooling, such an assignment provides a destination for default routing, should routing information be unavailable from the LNP routing database. The method with which selection of the LERG assignee is made in an individual telephone number pooled environment must be determined.

7.3.4 Provision of Information to the NPAC/SMS

In theory, individual telephone number pooling presents the same choices for interaction from the industry inventory pool to the NPAC/SMS as those identified for block pooling. That is, numbers can be identified in the NPAC/SMS as ported immediately upon their assignment from the pool or only after they are activated (i.e., assigned by the service provider to a subscriber).

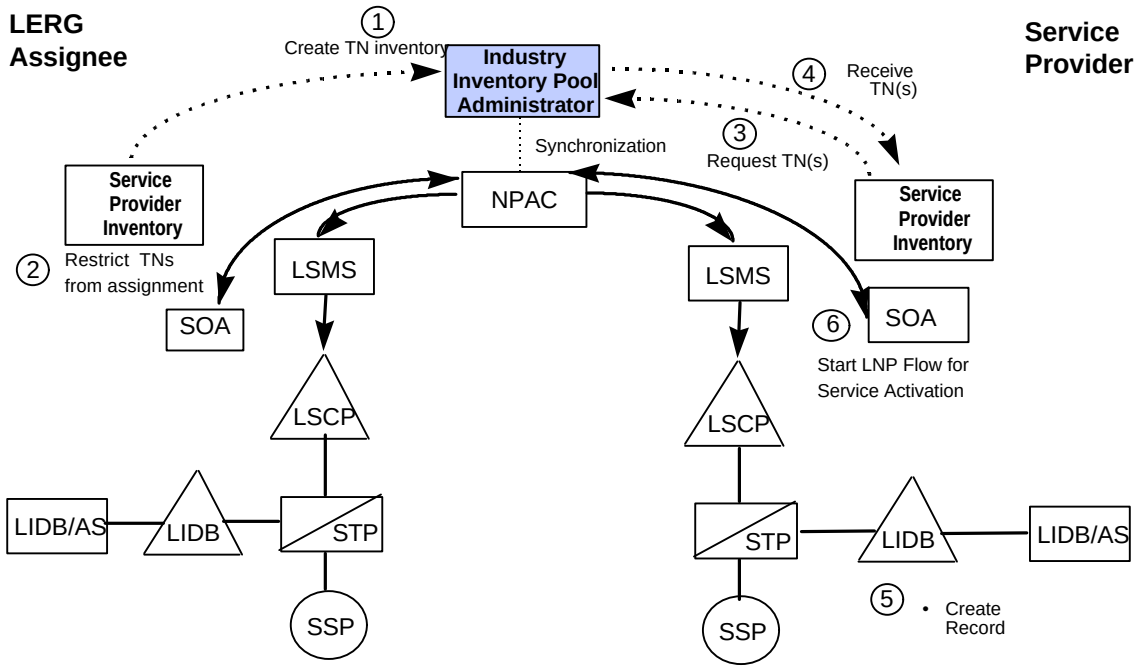
7.3.5 Treatment Upon Disconnect

Upon disconnect of a telephone number, the disconnecting service provider will age that number according to industry guidelines. Depending upon the pooling alternative that is chosen by the industry, the disconnected telephone number may be made available for reassignment via snapback to the industry inventory pool or by remaining with the disconnecting service provider.

7.3.6 Schematic Representation of Process Flows for Individual Telephone Number Pooling

INDIVIDUAL TN POOLING

The following figure depicts the process flows associated with number assignment in a Individual Telephone Number pooled environment.



1. Industry Inventory Pool Administrator creates and maintains inventory of TNs from growth (and embedded) NXXs necessary to satisfy forecasted demand. LERG assignees need to be identified for new NXXs. (Under existing procedures this is a 66 day process)

2. LERG Assignee(s) restricts all poolable TNs from assignment in their Service Provider Inventory System.

3. Service Provider requests a TN(s) for inventory replenishment or customer orders from the Industry Inventory Pool Administrator.

4. Service Provider receives a TN(s) from the Industry Inventory Pool Administrator .

5. Service Provider creates record in LIDB and LIDB/AS for TN if required by the block holder.

6. LNP flow for service activation starts by sending an LSR to the NPAC based on standard LNP procedures. Current intervals for porting numbers is 3 days.

7. If necessary, LERG Assignee removes TN(s) from their Service Provider Inventory System(s), ~~and~~ TN(s) from their SSP, and records from their LIDB and other data bases. LERG Assignee removes group record from LIDB and LIDB/AS.

Additional Assumptions:

- Flow supports both single number and inventory TN replenishment.
- LERG Assignee responsible for vacant number treatment.
- Service Provider (ported TN) is responsible for aging treatment.
- Industry Inventory Pool Administrator identifies the TNs assigned to each service provider.
- Synchronization is required between Industry Inventory Pool Administrator and the Regional NPAC.

The Industry Inventory Pool Administrator will have the ability to provide TNs to service providers in real time and non-real time; single and batch. Line level pooling may cause group records to be eliminated from LIDB and LIDB/AS. If so, all information will be done at the line level.

8.0 NUMBER ASSIGNMENT

Number assignment refers to the process through which numbering resources are allocated to eligible service providers. Some aspects of the assignment/allocation process in a pooled environment will remain consistent with the guidelines currently in place for central office code assignment. For example, the criteria for assignment/allocation of resources will continue to be dependent upon a service provider's certification that:

- it is authorized to provide service in a given area,
- it will use the resources for assignment to its subscribers to terminate PSTN traffic at a switch or point of interconnection under its control, and
- it has a need (i.e., a forecast or specific customer request) for the resources.

Additionally, the assignment process in a pooled environment will include significant changes relative to the current procedures:

- First, the CO Code Assignment Guidelines must be modified to enable the pool administrator to obtain CO/NXX Codes for the Industry Inventory Pool

- Second, the increment of assignable resources will change from an NXX code (10,000 TNs) to the designated block or range of TNs.

- Third, total resources assignable at any one time will have to be prescribed; that is, whether there will be limits on the number of blocks, or the number of TNs that can be allocated at any one time.

- Fourth, the request process will need to be reviewed. It must be determined if the use of request forms, similar to those used today, will continue OR if having an industry inventory pool requires an electronic process to supplement or replace existing forms. It may also be necessary to review the time frames associated with assignment and determine if number pooling allows or requires those intervals to be modified.

Finally, the use of pooling demands that additional items be considered and included in assignment guidelines. These include criteria:

a) to keep the service provider inventory sufficiently maintained;
b) for assignment to customers needing a large block of consecutive TNs that are not currently in the service provider inventory;
c) for assignment for customers wanting TNs that are not in the service provider inventory;
d) for the assignment of vanity numbers;
e) for blocks of numbers that span across thousands blocks; and
f) to assist large end users that have difficulty using numbers within certain blocks, e.g., 0000 and 9000.

9.0 OPERATIONS/PROVISIONING

The implementation of number pooling will have significant impact on operations support systems of some service providers, particularly those OSSs which are used in the provisioning process. Typically, existing systems are based upon the availability of a full central office code (i.e., NPA-NXX) and will therefore require modification. In some cases, additional functionality is required. In other cases pooling causes an increase in the volume of system processing. The impact on OSSs varies depending on the pooling alternative recommended in this report and the service provider's systems.

9.1 THE INDUSTRY INVENTORY POOL

Number pooling will require the establishment of an industry inventory of numbering resources (i.e., the pool) and associated systems which will support the administrative functions of, for example, inquiry, number reservation, and assignment. This system or

systems will need to support the combined volume of transactions forecast for all the service providers who interface with the industry inventory pool.

9.2 INDUSTRY INVENTORY POOL INTERFACE

Standard interfaces between the industry inventory pool and service provider inventories will be required. These interfaces will support the transactions and the transfer of information associated with the request and assignment of resources or information requests from the industry inventory to the service provider inventory pool.

9.3 SERVICE ORDER SUPPORT

For some service providers considerable interaction is required among the multiple OSSs which are involved with the provision of customer service. Such OSSs assign a specific telephone numbers to subscribers, and identify the services to be provided to customers, including the local calling area. To the extent that these OSSs must now interface with a new inventory of numbering resources, modifications may be necessary.

9.4 SERVICE ORDER MECHANIZATION

The generation of service orders, necessary for the provision of service, is a mechanized process which is currently based on the traditional association of a full central office code (NPA-NXX) to a given switch. Modifications are necessary to accommodate the allocation of less than full CO codes to service providers, the association of those numbers or blocks of numbers to a given rate center, and the possibility that those numbers will serve customers in multiple switches in that rate center.

9.5 TELEPHONE NUMBER SELECTION - CUSTOMER LOCATION IDENTIFICATION

TN selection is typically based upon customer location and the association of an NPA-NXX with a switch that serves that location. Number pooling will no longer support the association of a full NPA-NXX with a given location (switch) and will therefore require the modification of systems that perform TN selection.

9.6 TELEPHONE ADMINISTRATION/ASSIGNMENT

Systems which inventory working and spare office equipment and perform associated functions of load balancing are again based upon the assignment of a full CO code (NPA-NXX) to a given switch. Modifications to these systems will be required to reflect the assignment practices associated with a number pooling environment.

9.7 EMERGENCY ADMINISTRATION - SELECTIVE ROUTING

Routing and customer location information associated with emergency services (i.e., E911) is presently based upon NPA-NXX. It appears that additional modifications to E911 will not be required for pooling beyond what is needed for LNP. However, E911 configurations in a specific pooling area should be reviewed prior to pooling implementation to ensure that no E911 changes are necessary.

9.8 END USER BILLING - BILLING CYCLES

The “balancing” of end user billing cycles as well as the utilization of bill inserts associated with specific geographic areas (e.g., wire centers) are currently supported through the traditional association of NPA-NXX with a given switch. Number pooling requires modification to the OSSs which support these functions to accommodate the use of number pooling and the loss of the ability to associate NPA-NXX with a given switch.

9.9 SERVICE PROVIDER IDENTIFICATION

There are different OSSs that have used the NPA/NXX as a means to identify the associated service provider. This is particularly true for billing and collections, and impacts systems such as CMDS and LIDB. LNP breaks the tie that permitted identification of the entity providing the service by an examination of the associated NPA/NXX. Depending on the method selected pooling may exacerbate this problem. To resolve this other means will have to be found to perform identification of the service provider. This may advance the need for investment required to support changes to OSSs over and above those required to support LNP.

9.10 TRANSLATIONS SUPPORT

With the introduction of number pooling, switch translations required for call routing and associated with class of service, specialized routes, calls to pre-subscribed~~presubscribed~~ carriers (both inter-LATA~~interLATA~~ and intraLATA toll) will no longer be established based upon NPA-NXX, but will instead be provisioned on a per line basis. The added complexity required by pooling may require modifications to the translations process and the OSSs which are used for this function.

9.11 POOL ADMINISTRATION

Currently service provider numbering resources are typically augmented with full CO codes. Because number resources will be allocated in smaller quantities, pooling is

likely to require increased activity (i.e., additional transactions) to maintain their numbering resources and will therefore add some administrative burden to this process

9.12 GENERIC SERVICE PROVIDER SYSTEM IMPACTS

Some service providers, especially CMRS, have combined billing, provisioning and inventory systems. If a service provider with combined systems elects to obtain numbers only from the industry inventory pool or needs numbers to immediately satisfy a specific customer request, new interfaces and potentially new hardware would be needed to permit these systems to interface with external systems or to function individually.

10.0 NUMBER ADMINISTRATION

Number administration in a pooled environment is primarily concerned with the management of the number pool and the need to assure that resources are readily available, consistent with industry guidelines. The administrator must monitor the supply of numbers in the industry inventory pool, track the demand for numbers, and grow the pool as necessary. Administrative responsibilities extend beyond those of the industry inventory pool administrator and include those associated with the service provider, the NPAC, and the CO code administrator. Specific responsibilities of the pool administrator, along with other involved entities, are described in Sections 10.2 - 10.6.

10.1 BASIC ASSUMPTIONS

The administrative responsibilities and activities in a number pooling environment identified in this Section are based upon the following assumptions.

a) Multiple service providers may offer service in any given rate center.
b) Any switch based service provider operating within the specified geographic area is allowed to be involved in the pooling transition planning meetings.
c) A single administrator will oversee all the (rate center) pools within a given NPA. A pool administrator may oversee industry inventory pools for more than one NPA.
d) The CO Code Administrator will continue to perform CO Code administration functions.
e) The existing CO Code Guidelines will be used as a baseline for Pooling Administration Guidelines.
f) Within a given area of pooling, number pooling will be implemented per industry guidelines.
g) Growth (i.e., unassigned) codes will be assigned to the pool.
h) Embedded (i.e., assigned) codes may be used to populate the industry inventory pool subject to industry guidelines.

i) Growth CO Codes placed in the industry inventory pool will require the selection of a LERG assignee (selection method to be determined).
j) Service providers will obtain numbering resources from the industry inventory pool consistent with industry guidelines.
k) The industry inventory pool will be administered in such a way that it always contains numbering resources adequate to satisfy demand.
l) Pooling will be implemented in such a manner to permit timely activation of TNs to meet customer and service provider requirements.
m) Pooling will be implemented in a manner that will minimize the impact to existing internal service order processes currently used by service providers.
n) New service providers wishing to participate in an industry inventory pool after pooling is in operation will be provided an initial quantity of TNs to populate their inventory in accordance with industry guidelines.
o) The CO code activation process used to activate new CO codes in a pooling environment will be the same for all pooling alternatives.

10.2 THE POOL ADMINISTRATOR

It is assumed that the administrator of the industry inventory pool will be a neutral third party.

10.3 GENERAL RESPONSIBILITIES OF THE POOL ADMINISTRATOR

The pool administrator will:

a) maintain an internal secured database that will include all pooled number resources, the status of the resource (i.e., assigned, non-assigned), and if assigned, the identity of the service provider to which the resource is allocated;
b) maintain an industry database accessible by all service providers that will include all pooled number resources and the status of the resource (i.e., assigned, non-assigned);
c) process applications from service providers for numbering resources consistent with industry guidelines;
d) manage a reservation process for numbering resources in the industry inventory in accordance with industry guidelines;
e) receive and compile forecasts of demand from service providers for numbering resources within given rate centers;
f) analyze service provider forecasts to determine the numbering resources required to maintain the industry inventory pool;
g) assure the availability, based upon industry established criteria, of numbering resources within the industry inventory for a given rate center;

h) add to the resources in the industry inventory pool when necessary, by requesting additional CO codes from the CO code administrator, consistent with yet to be established process;
i) coordinate the transfer of information to the NPAC as necessary;
j) arrange for and/or perform audits of service provider utilization of assigned resources, as required; and
k) assume responsibility for the creation and distribution for any reports the industry deems needed or desirable.

10.4 GENERAL RESPONSIBILITIES OF THE SERVICE PROVIDER

~~The s~~Service provider~~s~~ participating in number pooling will:

a) determine and request resources for a given rate center, consistent with industry guidelines;
b) provide to the pool administrator a forecast of its number resource requirements for a given rate center ;
c) maintain, at a minimum, a record of specific information regarding the status of individual telephone numbers (e.g. working, reserved, aging, etc.) within their inventory;
d) be capable, at a minimum, of supporting the following number administration functions: TN assignment , ~~maintenance of the integrity of blocks of TNs,~~ maintain all TN status', e.g., spare, working, aging, and reserved status, etc., of all TNs allocated to that service provider; and
e) provide snapback notification to the pooling administrator (if necessary) for non-ported disconnected telephone numbers.

10.5 GENERAL RESPONSIBILITIES OF THE NANPA/CO CODE ADMINISTRATOR

The NANPA/CO Code Administrator will:

a) perform those functions currently specified in industry guidelines (e.g., CO Code (NXX) Assignment Guidelines, NPA Relief Planning Guidelines, etc.) or as modified to accommodate number pooling.

10.6 GENERAL RESPONSIBILITIES OF THE NPAC

The NPAC will:

a) provide the pool administrator with any necessary information (e.g., SPI, LRN, Effective Date) of pooled numbering resources that are ported;
b) coordinate service provider requests and execute the pool administrator's authorizations to change the porting status of pooled resources;

c) interact with the pool administrator, as identified in industry guidelines; and
d) provide the notification of snapback for only ported disconnected telephone numbers.

11.0 ALTERNATIVE ARRANGEMENTS FOR NUMBER POOLING

The following sections describe four alternatives which might be used to provide number pooling. The alternatives involve different levels of pooling and assume different types of number inventories with the allocation of numbering resources based upon a either a forecast of the exhaust of a service provider's inventory or that service provider's need to immediately satisfy a specific customer's needs. Two levels of pooling are described – block pooling and line level pooling. Although a single level of block pooling is identified – 1000s blocks – the architecture, process flows, and associated impacts should be the same for all practical levels of block pooling (e.g., 100s blocks) should they be considered. Specifically, the alternatives include one scenario which supports block pooling (Alternative 2) and three alternatives which consider line level or telephone number (TN) pooling. (Alternatives 1, 3 and 4)

11.1 Alternative 1

- Level - Individual Telephone Number (TN) with the capability to request variable quantities of numbers
- Inventory - Service Provider Inventory Optional (supports use of a service provider inventory, industry inventory pool, or both, at discretion of service provider)
  Allocation Mechanism - Supports assignment based upon a forecast of exhaust of resources within a SP's inventory or the capability to immediately satisfy a specific customer request.

This alternative would provide a service provider the flexibility to request telephone numbers on an individual basis or in multiple quantities. Assignable numbers would be resident in an industry inventory and would typically be obtained by a service provider upon request based upon forecasted demand or on an immediate basis to satisfy a specific customer request.

11.2 Alternative 2

- Level – 1000s block assignment only
- Inventory - Service provider inventory required
- Allocation Mechanism – Supports assignment based upon a forecast of exhaust of resources within a SP's inventory.

This alternative allocates numbering resources to service providers in blocks of 1000 sequential numbers, specifically in 1000s blocks defined by the range of line numbers from “X000” to “X999”. Number allocation is based upon a forecast consistent with industry guidelines.

11.3 Alternative 3

- Level - Individual telephone number (TN) (with the capability to request variable quantities of numbers)
- Inventory - Service provider inventory required
- Allocation Mechanism - Supports assignment based upon a forecast of exhaust of resources within a SP’s inventory

This alternative (as with Alternative 1) allows a service provider to request numbering resources either as a single number or in variable quantities. However, this arrangement would only support allocation based upon a service provider’s forecast, and does not allow for the immediate allocation of numbers based upon a specific subscriber need. Assignment of numbers to subscribers would only be made by a service provider using numbers available in its own inventory.

11.4 Alternative 4

- Level - Individual telephone number (TN) with the capability to request variable quantities of numbers
- Inventory - Demands the use of an industry inventory only; does not allow for the use of a service provider inventory
- Allocation Mechanism - Supports immediate assignment based upon specific customer needs

This alternative also permits the allocation of resources as individual numbers or variable quantities of numbers. This arrangement, however, allows for an industry inventory only and the associated process of immediate assignment based upon specific customer need. Accordingly, with this arrangement, service providers will search for and obtain numbers through direct interaction with the industry inventory of numbering resources.

11.4.1 On The Viability of Alternative 4

Current number provisioning systems and service order processes rely on the interaction of a multitude of OSSs with a locally administered (service provider) inventory of numbers. Alternative 4 precludes the use of such an inventory and demands the sole availability of an industry inventory which would be directly involved in all number search and assignment activities associated with provisioning of

subscriber services. The continued use of a service provider inventory affords a natural evolution from the existing environment and avoids the significant changes and potential burdens that would accompany its elimination.

The INC therefore concludes that service provider inventories must be available – at least as an option -- as a characteristic of all viable alternatives for number pooling. Alternative 4, which precludes the use of a service provider inventory, is therefore eliminated and will not be considered for further evaluation.

12.0 CRITERIA FOR ASSESSMENT OF ALTERNATIVES

The following criteria/characteristics are key to the study of the alternatives identified in Section 11.0. They are explained here and used in Section 13.0 to assess the alternatives.

12.1 IMPROVEMENT IN NUMBER UTILIZATION

The primary potential benefit of number pooling is an increase in the utilization of numbering resources and the associated delay in the possible need for NPA relief. Accordingly, each alternative should be evaluated based upon its ability to promote efficient use of numbers.

12.2 IMPACT ON INFRASTRUCTURE

As described in Sections 5 and 7, the deployment of number pooling demands changes within the infrastructure. The use of number administration databases, the need for service provider maintained number inventories, and the linkage to the LNP LSMS are examples of network additions/modifications that may be required. The extent of the effort associated with each alternative must therefore be considered.

12.3 IMPACT ON OPERATIONS

The impact of number pooling on operations, especially service provisioning, could be significant. Changes to OSSs associated with provisioning, as well as downstream processes such as billing/settlements, must be understood and included as part of any assessment of a given alternative.

12.4 IMPACT ON END USERS

End user concerns and needs must be considered with any implementation of number pooling. Specifically, the degree to which any number pooling scenario might contribute to customer confusion should be determined. Moreover, the ability to meet customer needs and specific requests for telephone number assignments such as the

request of a business customer for a large, sequential block of numbers must be addressed and understood.

12.5 IMPACT ON NUMBER ASSIGNMENT

The number assignment process associated with each alternative described for number pooling must be described and understood. The process should be consistent with the Equal Availability Principle and, to the extent possible, be easy to implement and without undue complexity.

12.6 IMPACT ON ADMINISTRATION

The pool of numbers available for assignment within a given geographic area will be overseen by an administrator. The responsibilities of the pool administrator, which might include monitoring the utilization of the Industry Inventory Pool and planning for its growth, should be easily performed, thereby assuring the continued availability of numbers. Any distinction among the alternatives relative to the ease of administration should be identified and used as a criterion for assessment.

The following is a list of suggested criteria to be used in evaluating the impact on the administration of the pooling alternatives:

1. Complexity of Administration Process

This criterion measures the overall complexity of the administrative functions and processes that make up the pooling option. These include:

- Forecast/Demand
- Application/Response
- Approval/Notification
- Jeopardy
- Transition to Pooling
- Audit Procedures
- Interdependencies

2. Record Keeping

Record keeping refers to the amount of information for each record and the quantity of records required to implement a given pooling arrangement. It may also address the quantity of code requests, necessary documentation, retention period, etc.

3. Size Of Industry Inventory Database

This criterion is a measure of the size of the required database necessary for a given pooling option. The size (e.g., quantity of entries in the database) reflects the necessary memory and hardware requirements that a given pooling option would require.

4. Security Considerations
This criterion measures the complexity of the security requirements for administration of the industry inventory database.

5. Impact On Industry Pooling Administration System Infrastructure / Architecture
This criterion measures the complexity of the pooling administration system infrastructure / architecture, (e.g., quantity of data links, number of interfaces, system performance measurement, etc.).

6. Impact on Service Provider Administration
This criterion measures the impact of the pooling alternatives on service providers' administrative requirements.

7. Ease of Implementation
This criterion evaluates the length of time and complexity involved with implementation of each pooling alternative.

8. Service Provider Impacts
This criterion evaluates the ease with which a service provider obtains the numbering resources required.

12.7 RELATIVE COST

The relative cost to develop and deploy any form of number pooling is a key factor in the assessment of any pooling alternative. The costs of interest are the differences that can be identified that might make the cost of one alternative more or less expensive than another. The relative costs will be those associated with estimated industry costs, as it is not expected that any individual service provider's cost be documented. It is recognized that cost associated with any alternative for pooling, in and of itself, may not be the overriding factor, but rather that cost must be considered in the ultimate assessment of choices for implementation.

12.8 TIME FOR AVAILABILITY

The time frame~~timeframe~~ for implementation for any alternative should be determined, with merit associated with those alternatives that can be deployed sooner rather than later.

13.0 EVALUATION OF ALTERNATIVES

Due to time constraints, the INC was unable to review Section 13. The text of this section can be found in Appendix A.

14.0 CONSIDERATIONS RELATED TO THE IMPLEMENTATION OF POOLING

As described in Section 3.4, the primary benefit provided by pooling is derived from the increased utilization of numbering resources that pooling can potentially provide. This benefit must be weighed against the effort and costs associated with the implementation of pooling, which involve deployment of the necessary modifications to network architecture, the changes mandated in administration and assignment processes, and the modifications required in operations support systems.
It is therefore necessary to assess the potential benefit of pooling specific to any jurisdiction in which it is being considered. Such an assessment should address the following questions:

- How long will pooling extend the life of the NPA?
- How many service providers cannot participate in pooling (i.e., they are not LNP capable) and therefore, will require full CO/NXX Codes which will not be available for the pool?
- How might pooling impact the infrastructure deployed to support LNP?
- How soon can pooling be deployed?
- Can pooling be implemented without significant negative impact to any particular industry segment?

Determination of the increase that pooling might provide to the life of the NPA is dependent upon the use of industry data which quantify the available resources and industry forecasts which identify the future demand for resources. A Lockheed Martin/Bellcore contribution (LNPA-60) to this workshop effort described such an assessment. The results of this type study are wholly reliant on data unique to the

area for which they are performed, and cannot generally be extrapolated to other areas.

It does appear, however, that the benefit associated with pooling – that is, the ability to better utilize numbering resources and delay the need for NPA relief – is better realized if pooling is initiated "early in the life" of a given NPA, when there exist a large number of NXX codes still unassigned. It further appears that the implementation of pooling "late in the life" of an NPA, for example when the code is already in a jeopardy situation, is likely to provide relatively little delay in the need for NPA relief.

15.0 TRANSITION

Transition planning is necessary to permit the effective and efficient migration from the current central office code based number assignment and administration processes to those associated with a pooled environment. Key to this transition is the:

- identification of the pool administrator
- establishment of the industry inventory of numbering resources and the possible use of embedded as well as growth numbers to initially populate the industry inventory.
- development of assignment and administrative guidelines

15.1 RESOURCES FOR THE INDUSTRY INVENTORY POOL

Both newly assigned and embedded numbering resources will be considered for inclusion in the industry inventory pool subject to yet to be developed industry guidelines. These guidelines should include, but not be limited to, criteria for the initial establishment of the pool, its ongoing maintenance, and a determination of eligibility of resources for the pool.

The INC recommends that embedded 1000s blocks, either uncontaminated or contaminated up to a level of 10%, be considered by the pool administrator for placement in the industry pool, initially and on an ongoing basis. The INC recognizes that the use of contaminated blocks, although potentially improving number utilization, adds administrative burden, increases capacity requirements in LNP SCPs, and may not be warranted in all cases.

The specific level of contamination (0% to 10%) necessary to meet industry needs in a specific area will be determined by the pool administrator, consistent with pooling guidelines. The administrator should attempt to satisfy industry demand with blocks associated with the lowest level of contamination; first considering the use of uncontaminated blocks (i.e., 0%), and only then considering employing blocks with increasing levels of contamination (up to 10%).

Embedded 1000s blocks for which a service provider has a forecasted demand will not be considered for placement in the industry pool.

16.0 RECOMMENDATIONS [11]

Number pooling potentially offers improvement in number utilization. Its implementation, however, requires significant changes to current administrative processes, modifications to existing systems, and the development of new systems. The extent of these changes and additions and, therefore, the time frame in which pooling could be implemented are specifically dependent upon the pooling alternative selected and the local conditions where pooling is to be implemented.

The INC recommends that number pooling be implemented in an evolutionary manner, with the initial deployment of 1000s block pooling (Alternative 2) with migration to an individual TN pooling arrangement (e.g., Alternative 1 or 3) as a long term goal.

Further, the INC believes that 1000s block pooling appears to be less complex than individual TN pooling and could be implemented in a shorter time frame. It is further recognized that individual TN pooling, although more administratively complex, may offer even further improvement in utilization than block pooling.

The implementation of 1000s block pooling cannot be realized without modifications to existing systems and industry consensus on specific key details relevant to the assignment and administration processes. These include the need to identify the arrangement for snapback, a method for determining the LERG Assignee, the use of pre-port or port on demand, criteria for the identification and the possible use of embedded number resources, a uniform pooling architecture, the development of administrative and assignment guidelines and the selection of a pooling administrator(s). Therefore, the INC recommends that the industry's immediate efforts focus on these and other issues essential for the near term implementation of block pooling.

Subsequent to resolution of the issues associated with block pooling, the INC will develop a proposal for the transition to individual TN pooling.

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11 It must be recognized that only LNP capable networks should participate in number pooling. Non -LNP-capable networks, nonetheless, must have equivalent access to adequate numbering resources via current industry assignment guidelines.

APPENDIX A

INDUSTRY NUMBERING COMMITTEE (INC) CONTRIBUTION

LNPA WORKSHOP

TITLE: Number Pooling Evaluation Matrix - Issue 105 – LNPA-48

DATE: 9/29/97

SOURCE: Josephine A. Gallagher
Bell Atlantic
1310 North Court House Rd.
3rd Floor
Arlington, VA 22201
Tel: 703-974-8160
Fax: 703-974-0616
Email: josephine.a.gallagher@bell-atl.com

ABSTRACT: Attached is a draft alternative evaluation matrix.

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Assessment Criteria	1 -Line lvl, SPIV optional	2 - Thou blks, SPIV required	3 - Line lvl, SPIV required
1. Number utilization	Most efficient use of numbers; only "stranded" numbers are those unused in SP inventories; issue may be size of SP inventories Efficiency could be maximized if all embedded codes in IIV. Maximum benefit	Provides more efficient use of numbers compared to current 10,000 number allocation; more "stranded" numbers for SPs who need <1000 numbers/rate center. Could be even less efficient if "slightly contaminated" 1000 blocks not in IIV. Relatively lower benefit compared to Alts. 1 & 3	Most efficient use of numbers; only "stranded" numbers are those unused in SP inventories; issue may be size of SP inventories Efficiency could be maximized if all embedded codes in IIV. Maximum benefit

	1 -Line lvl, SPIV optional	2 - Thou blks, SPIV required	3 - Line lvl, SPIV required
2. Infrastructure impacts	**IIV pool** - supports TN inventory at line level; larger database required; database functionality required to track status of numbers (assigned, spare, aging, reserved) for SPs without SPIV; large database could be required if large SPs opt for no SPIVs. Must support "on demand" requests for specific numbers/"good numbers". Very High Impacts **IIV pool interface to SP OSSs** - Downloads allocations at individual TN level. High volume interface for updates to IIV pool for every change in TN status for SPs with no SPIVs. High volume interface to support search for, obtaining numbers "on demand," as well as for	**IIV pool** - supports TN inventory only to thousands block; smaller database required; "Good" numbers embedded in thousands blocks. Low compared to Alts. 1 & 3 **IIV pool interface to SP OSSs** - lower volume interface; still in critical path for pooling implementation but lower risk because less complex.	**IIV pool** - supports TN inventory at line level; larger database required. Supports specific number/"good number" requests but not on demand basis. High **IIV pool interface to SP OSSs** - Downloads allocations at individual TN level. Still in critical path for pooling implementation but may be less risk compared to Alt. 1.

	SPs with no SPIV IIV pool access is in critical path for volume interface to support search for, obtaining numbers "on demand," as well as for SPs with no SPIV IIV pool access is in critical path for pooling implementation; availability and speed of response issue. High **LNP SMS, LNP SCPs** - Potential LNP SMS interaction for every activated number for SPs without SPIV (if updates done by PA). If no pre-port, LNP transaction for disconnects on non-LERG assignee switches. Different impacts if pre-port SPIV, or if snapback to SPIV vs. IIV.	Lower compared to Alts. 1 & 3 **LNP SMS, LNP SCPs** - *pre-port* - very large, immediate increase in size or modification to support treatment by blocks; (open issue GTTs). *port on demand* - LNP SMS interaction for every activated number and disconnected number on non-LERG assignee switches. *Snapback* to block assignee vs. code assignee impacts LNP SMS translations. Low/Medium	Medium/High **LNP SMS, LNP SCPs** - If no pre-port, LNP transaction for disconnects on non-LERG assignee switches. Different impacts if pre-port SPIV or snapback to SPIV vs. IIV. . Medium/High **SSPs** - No impacts unless pre-port. If pre-port SPIV,

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	High **SSPs** - No impacts unless pre-port. If pre-port SPIV, unassigned number must be acceptable in GAP; change from LNP procedures Potential SSP real time processor issue if pre-port and use "two pass" database search method.	**SSPs** - If pre-port, unassigned number must be acceptable in GAP; change from LNP procedures. Potential SSP real time processor issue if pre-port and use "two pass" database search method.	unassigned number must be acceptable in GAP; change from LNP procedures Potential SSP real time processor issue if pre-port and use "two pass" database search method.

	1 -Line lvl, SPIV optional	2 - Thou blks, SPIV required	3 - Line lvl, SPIV required
3. Operations impacts	Interface with IIV (see above). Increased administration associated with lack of block structure. If no SPIV, may need to consult IIV pool to determine status of own numbers. If so SPIV, OSS changes to support updates to IIV pool regarding number status. OSS changes for rate center association with numbers at line level. Some manual "exception" treatment of ported numbers may require mechanization due to increased volume. If port on demand, modifications to service negotiation and service order processing systems will be required to indicate that	Interface with IIV (see above). OCN mapping to thousands blocks in TPM, LERG. OSS changes to assign numbers only within assigned blocks, changes to support thousands block/rate center structures in administrative tables. SP OSSs continue to perform TN assignment, administration, and inventory for thousands blocks assigned to them. OSS changes to mechanize If port on demand, modifications to service negotiation and service order processing systems will be required to indicate that	Interface with IIV (see above). Increased administration associated with lack of block structure. OSS changes for rate center association with numbers at line level. Some manual "exception" treatment of ported numbers may require mechanization due to increased volume. If port on demand, modifications to service negotiation and service order processing systems will be required to indicate that

	pooled number must be ported in when assigned to a customer. High	pooled number must be ported in when assigned to a customer. Medium	pooled number must be ported in when assigned to a customer. Medium/High

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	1 -Line lvl, SPIV optional	2 - Thou blks, SPIV required	3 - Line lvl, SPIV required
4. End user impacts	Few end user impacts - supports ability to obtain sufficient numbers to meet an end user's request. Possible concern regarding IIV pool in critical path if no SPIV or insufficient numbers in SPIV, e.g. how to serve demand requests in IIV system down or data links to it are down. Medium	Minimal end user impacts - supports ability to obtain sufficient blocks of numbers to meet an end user's request. Possible concern regarding IIV pool critical path if insufficient numbers in SPIV Low	Minimal end user impacts - supports ability to obtain sufficient numbers to meet an end user's request. Possible concern regarding IIV pool critical path if insufficient numbers in SPIV. Low

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	1 -Line lvl, SPIV optional	2 - Thou blks, SPIV required	3 - Line lvl, SPIV required
5. Number assignment impacts		Most straightforward allocation plan. All SPs get blocks of numbers based on forecast. "Good" numbers allocated equitably. Most like current approach to SPIVs. Snapback impacts will differ if snapback to IIV vs. SPIV. Low compared to Alts. 1 & 3.	Somewhat complex assignment processes; guidelines for variable size SPIV assignments; how to determine smallest/largest size of allocations; "good" number definition and assignment guidelines. Guidelines must allow efficient equitable use of numbers while keeping blocks as whole as possible for business customer needs. Complex guidelines, likely implementation via complex algorithm. Snapback impacts will differ if snapback to IIV vs. SPIV. Medium/High

	1 -Line lvl, SPIV optional	2 - Thou blks, SPIV required	3 - Line lvl, SPIV required
6. Administration impacts	Analysis of reports from SPIV assignees + interactive demands to assess NXX exhaust. TN administration for SPs with no SPIVs. Potential LNP SMS interaction for every activated number for SPs without SPIV (if updates done by Pooling Administrator). High	Analysis of reports from block assignees to assess NXX exhaust. Low compared to Alts. 1 & 3	Analysis of reports from SPIV assignees to assess NXX exhaust. Medium

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	1 -Line lvl, SPIV optional	2 - Thou blks, SPIV required	3 - Line lvl, SPIV required
7. Relative costs	Probably highest cost relative to Alternatives 2 & 3 both to establish and on-going industry and SP administration.	Probably least cost approach both to establish and on-going industry and SP administration.	Probably lower cost than Alternative 1 but higher cost than Alternative 2 both to establish and on-going industry and SP administration.
8. Time for availability	Critical path concerns - IIV pool database planning and development, interface to LNP SMS, pooling administrator, assignment guidelines, operations impacts. Probably longest path because most complex.	Critical path concerns - SCP capacities; modifications for pre-porting, pooling administrator; assignment guidelines, OSS impacts. Probably shortest path because least complex.	Critical path concerns - IIV pool database planning and development, interface to LNP SMS, pooling administrator, assignment guidelines, operations impacts. Probably shorter path than Alt. 3 but longer than Alt 2 because of relative complexities.

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Acronyms

GAP	Generic Address Parameter
SPIV	Service Provider Inventory
IIV	Industry Inventory
SSP	Service Switching Point
LERG	Local Exchange Routing Guide
OSS	Operations support systems
LNP	Local Number Portability
TPM	Terminating Point Master
NPAC	Number Portability Administration Center
SCP	Service Control Point
SMS	Service Management System
SP	Service Provider

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1200 G Street NW
Suite 500
Washington DC 20005
www.atis.org
(202) 628-6380

INDUSTRY NUMBERING COMMITTEE (INC)

DRAFT
THOUSAND BLOCK (NXX-X) POOLING ADMINISTRATION GUIDELINES

SEPTEMBER 22, 1998

TABLE OF CONTENTS

1.0 Purpose and Scope

This document specifies guidelines for the process of assigning thousands blocks (NXX-Xs) to service providers for use at a switching entity or point of interconnection (POI) they own or control. In addition, these guidelines outline the processes used between the Pool Administrator (PA) and:

- Code Holder
- LERG Assignee
- Block Holder,
- CO Code Administrator,
- Number Portability Administration Center (NPAC).

Number pooling, in the context of these Guidelines, allows for sharing of central office codes (NXXs) among multiple service providers serving the same rate center. All ten thousand numbers within each NXX continue to be associated with the same rate center designation (i.e. V&H coordinate), but can be distributed among multiple service providers at the thousands-block (NXX-X) level. Examples of uses for blocks for which these guidelines apply include plain old telephone service (POTS), Centrex, Direct Inward Dialing (DID), wireless service, facsimile, and coin phones.

Where number pooling has not been implemented, or is not in use by the service provider, the service provider (SP) shall apply directly to the CO Code Administrator for numbering resources. Guidelines addressing the assignment of central office codes (NXX) are covered under the Central Office Code (NXX) Assignment Guidelines (INC 95-0407-008).

These guidelines do not supersede appropriate NANP area governmental or regulatory principles, procedures, and requirements.

2.0 Assumptions and Constraints

The development of these number pooling assignment guidelines is based on the following assumptions and constraints:

2.1 NANP resources, including those covered in these guidelines, are collectively managed by the telecommunications industry with oversight by the regulatory authorities in areas served by the NANP The decision to establish a pool in any given location is a regulatory responsibility.

2.2 The PA will obtain the necessary service provider documentation to establish and administer the pool.

2.3 The NANP resources are considered a public resource and are not owned

by the assignees or the administrator. Consequently, the resources cannot be sold, brokered, bartered, or leased by the assignee for a fee or other consideration. If a resource is sold, brokered, bartered, or leased for a fee, the resource is subject to reclamation by the PA.

2.4 These assignment guidelines apply only to the assignment of thousands blocks to block applicants providing service within specific rate centers:

a that are subject to pooling as determined by regulators, and
b where permanent service provider local number portability (Location Routing Number capability LRN) has been implemented.

2.5 These guidelines were developed by the industry without any assumption on who would be the PA.

2.6 NANP numbering resources shall be assigned to implement the most effective and efficient use of a finite numbering resource in order to prevent premature exhaust of an NPA and delay the need to develop and implement costly new numbering plans. Efficient resource management and code conservation are necessary to stay the industry impacts of expanding the numbering resource (e.g., expansion from 10 to 11 digits). Impacts to the industry include:

a) Customer impacts (e.g., dialing, number changes to advertising and stationary, security systems, etc.)
b) CPE modifications
c) Domestic and international switching hardware and software modifications
d) Operational support systems modifications
e) Reprogramming of non-telecommunications databases that contain telephone numbers.

2.7 Block Applicants, utilizing resources from the pool, shall:

a) have (or will have) applied for the appropriate regulatory approval to operate in the area.
b) contribute numbering resources to the pool, in accordance with these guidelines and any regulatory directives.
c) establish internal policies and practices that provide for the efficient use and assignment of numbers to end users. These policies and practices shall balance product specifications and market strategies and customer needs with conservation principles to ensure best practices in number utilization. A service provider should assign out of a given block before making assignments out of another block.
d) minimize the use of TNs within blocks (NXX-X) for purposes other than subscriber assignments (e.g., test codes)
f be subject to audits to assure compliance with these guidelines, processes

and principles (see Section 12).

2.8 The schedule of holidays recognized by the PA will affect the administration of these guidelines. Holidays will not be considered a "calendar day" as a part of any timing of block allocations in association with these guidelines.

3.0 Block Administration Principles

The following assignment principles apply to all aspects of these guidelines:

3.1 Where number pooling has been implemented, PA will assign numbering resources in 1,000 block increments. Resources will be available from both contaminated and non-contaminated blocks. A contaminated block is a block, which contains one or more TNs that are unavailable for assignment. These include:

a) Numbers that are working with customers
b) Numbers assigned to pending service orders
c) Numbers classified as "Soft dial tone".
d) Numbers in the aging period
e) Reserved Numbers
f) Test numbers
g) Wireless dealer-numbering pools
h) Wireless temporary local directory numbers (TLDN)
i) Wireless E911 routing numbers (pseudo-ANI or Emergency Services Routing Digits)

3.2 A requirement for an entire NXX code (i.e., 10,000 numbers) to satisfy the numbering needs for a single customer1 shall be obtained from the PA, not the CO Code Administrator.

3.3 Numbering resources in the Industry Inventory Pool shall be available and allocated to service providers in a fair and non-discriminatory manner, i.e. on a first come, first served basis, including requests for specific blocks.

3.4 The information submitted by applicants for block assignments shall be kept to a minimum and shall be uniform for all applicants. All information provided on the Number Block (NXX-X) assignment request form will be considered confidential, except for selected information made available publicly only for those fields that must be input to the Routing Data Base System (RDBS) and Bellcore Rating Input Database System (BRIDS). The information placed in the RDBS or BRIDS becomes public upon assignment of the block in the appropriate

[1] Single customer is defined as one customer requiring 10,000 consecutive telephone numbers from one central office exchange.

routing data base product.

3.5 The PA will allocate a 1000 block to a service provider's single switch. The service provider will be allowed to use intra-service provider ports to share that 1000 block across multiple switches in a rate center. The actual distribution of numbers from a shared 1000 block will not be captured in the LERG.

3.6 Block Assignments will be made from NXX codes assigned and utilized within a single rate center. All SP switch rate center boundaries, which are consistent, will participate in a single pool. If a single SP has a rate center with boundaries that are not consistent with any other SPs, that SP will participate in a separate pool. All SPs will pool in accordance with these industry guidelines.

3.7 Any service provider that is denied the assignment of one or more blocks under these guidelines has the right to appeal that decision per Section 13.0.

3.8 The PA should accept and fulfill requests for specific blocks of numbers if they are currently available for assignment from the pool.

3.9 A service provider may exchange a block with the PA, only if the requested block and the exchanged block are in the same rate center, are uncontaminated, and the requested block is available for assignment.

3.10 Service Providers may not trade blocks between themselves.

3.11 The transfer of a block, if all 1000 TNs are assigned and/or reserved for a single customer, will be allowed when a customer ports from one service provider to another service provider only when both service providers mutually agree to it (See Section 9.5).

4.0 Service Provider Responsibilities

Service providers have many responsibilities in a Number Pooling environment. These responsibilities vary depending on whether the Service Provider is acting as a Code Holder, a LERG Assignee, a Block Applicant, or a Block Holder. These responsibilities are outlined below:

4.1 Code Holder Responsibilities

A Central Office Code Holder is an assignee of a full NXX. CO Code Holders can either be pool participants or not. CO Code Holders who are pool participants shall:

a) identify eligible blocks for donation to the pool upon initial establishment of the pool pursuant to Section 8.1, the initial establishment of the industry inventory pool.
b) update the LERG with the data on the 1000s blocks within pooled NXXs that are retained in its service provider inventory at the time of initial establishment of the pool. No LERG updates are required for NXXs that do not have blocks donated to the industry inventory.
c) The CO Code Holder becomes a LERG Assignee at the block donation date.

Pooling indicator at the NXX level? Pending completion of NRRIC work

4. 2 LERG Assignee Responsibilities

A LERG Assignee is the SP listed as the entity associated with a pooled NXX code in the LERG and is responsible for default routing functions associated with a pooled NXX Code. The LERG Assignee shall:

a) verify and test that the NXX is open prior to the NXX code effective date
b) provide blank and vacant code announcements for unallocated blocks
c) maintain sufficient and auditable data to demonstrate compliance with these guidelines (see Section 12).

4.3 Block Applicant Responsibilities

Applicants, requesting resources from the pool, shall:

a) have documentation demonstrating that the applicant is licensed and/or certified, or has applied for regulatory approval to operate in the area for which the central office thousands block is required
b) complete the number block (NXX-X) assignment request form per these guidelines.

4.4 Block Holder Responsibilities

A block holder (or selected designee) shall:

a) enter any necessary information into RDBS and BRIDS databases.
b arrange for the entry of any information (e.g. LRN, etc) to LIDB or other carrier-specific databases due to receipt of a new block.
c remove records from LIDB, or other carrier-specific databases, for blocks

returned/donated to the pool upon relinquishment of the block.]

d Service Providers that do not currently subscribe to LIDB need not add interfaces to or arrange for access to such databases

e abide by the block allocation and reclamation procedures outlined in Sections 9 and 10.

f provide forecasted block requirements to the PA for projecting rate center exhaust and for input to the NPA code relief planning process.

g maintain sufficient and auditable data to demonstrate compliance with these guidelines (see Section 12).

5.0 Pool Administrator Responsibilities

The following describes the high level responsibilities of the PA in:

1) General Administration Duties
2) Forecasting and Planning Processes
3) Assignment Processes
4) Utilization Reporting Processes
5) Block Reclamation Processes

Detailed PA responsibilities are described in the appropriate process sections.

5.1 General Administration Duties

5.1.1 The PA shall produce and make available upon request information regarding pooling administration processes, procedure, interfaces, and services. Additionally, the PA shall provide upon request of the pooling participant, information on how to obtain documents related to Pooling Administration. This can be accomplished by either referring them to web sites where it will be possible to download electronic copies or by providing paper copies if the requester cannot obtain the documents via the Internet.

The PA shall:

a) receive and compile forecasts of demand from service providers for numbering resources within given rate centers,

b) analyze service provider forecasts to determine the numbering resources required to maintain the industry inventory pool at 9 month's supply,

c) assure the availability, based upon industry established criteria, of numbering resources within the industry inventory for a given rate center,

d) add to the resources in the industry inventory pool when necessary, by requesting additional CO codes from the CO code administrator, consistent with yet to be established process.

e) work with the CO Code Administrator in the planning and implementation of NPA code relief. For specific details, see NPA Relief Planning Guidelines

(Document No.).

f) provide copies of the thousand block code assignment guidelines when requested by applicants, including timely notification of changes.[match with CO Code]
g) assist CO Code Administrator in analyzing and helping to resolve problems related to mis-routed calls and calls that cannot be completed.
h) track reported switch cut-overs and block reassignments, and perform other operational functions; e.g., block reclamation.
i be responsible for inputting necessary information into RDBS/BRIDS.
j make available on their web site the PA recognized holidays and distribute as necessary
k Build and maintain an industry database, including appropriate security for confidential data if any, accessible to all service providers through some mechanism yet to be defined to include all pooled thousand blocks contained in the industry inventory pool and the status of the blocks, i.e., allocated, and to which SP it is allocated, available, and whether or not it is contaminated.

5.2 Forecasting and Planning Processes

The PA shall:

a perform applicable utilization surveys of all blocks/NXXs within the pooled rate center.
b compile demand forecasts of all service providers participating in Number Pooling and generate a total forecast for the industry pool.
c perform statistical analysis of the utilization surveys and service providers' forecasts to evaluate NXX usage and assure adequate numbering resources are available for the industry's use through timely replenishment of the industry pool.
d work cooperatively with the NANPA in determining when the numbering resources appear to be nearing exhaust.

5.3 Assignment Process

The PA shall:

a receive all request(s) for 1000 blocks from service providers who have certified the need for assignment and validate the request(s) to ensure each applicant meets the criteria to be a block holder.
b verify that the applicant has completed the appropriate forms containing all of the pertinent information such as OCN, switch, LRN, effective date and Tandem.
c Assist, as necessary, pool participants with the completion of all pooling forms.
d attempt to satisfy all requests for specific 1000 block(s) whenever possible.
e select the specific block(s) for assignment and/or provide the reason the assignment cannot be completed.

f respond to the service provider request(s) within 7 calendar days following receipt of request by issuing the Part 3 PA Response/Confirmation form to the applicant.
g request new NXX codes from the CO Code Administrator to replenish the industry pool in order to meet a service provider's request for a specific block due to technical reasons. This includes processing of expedited requests when needed.

5.4 Utilization Reporting Processes

The PA shall:

l prepare and publish reports as required to the industry, NANPA, and regulatory authorities on utilization of the industry pool and provide forecasts on projected future usage.
m Treat Service provider specific data submitted to the PA as confidential.
n Aggregate any published data
o aggregate Block Holder forecast data and submit data to the Code Administrator(s) and to the NANPA for use in applicable forecast/utilization studies.

5.5 Block Reclamation Processes

The PA is responsible for ensuring that blocks are reclaimed when necessary.

6.0 Forecast and Utilization Reporting Process

Thousand block forecasts and utilization reports will be completed and submitted by service providers to the PA on the same semi-annual cycle. The data provided in these reports will allow the PA to correlate both the forecast and utilization data at the rate center level, the NXX level and the NPA level. This will also facilitate the comparison and analysis of the data by the PA.

6.1 Forecast Process

All participating service providers shall provide a forecast, on a semi-annual basis, by rate center to the PA. The pooling forecast is based on an 18-month interval. The forecast is incremental above the quantity of numbers already allocated in the SP inventory. The PA normally adjusts the industry inventory at the 6 month forecast cycle. To accommodate COCUS the total forecast interval would reflect requirements for 5 years. That portion of the forecast beyond 18-months would not be used to size the industry inventory pool.

If a Service Provider identifies a significant change in their forecast between interim forecasting cycles, they should provide an updated forecast.

In addition to a SP's forecast for 1000 blocks, the forecast should also identify a SP's need for an entire NXX code(s) to satisfy the need of a single customer.

The PA may, from time to time, require SPs to submit a forecast outside of the semi-annual schedule. It is expected that the forecast would be for a limited pooling area (e.g., a rate center). The PA will notify all SPs participating in the pooling area and provide a reasonable length of time for SP response (i.e., one month or more).

If a service provider submits an application for additional blocks beyond that which has been previously forecasted, the service provider could be restricted to their original forecasted amount to allow the PA sufficient time to replenish the industry inventory, when necessary, before the service provider's entire application can be fulfilled. For example, if satisfying the request would result in a Critical Industry Inventory Insufficiency in the industry inventory pool for a rate center, the PA may not meet the entire request.

In instances when the service provider has not provided a forecast, the PA will not allocate the 1000 blocks until a 60-day interval has passed. This interval will allow the PA sufficient time to replenish the industry inventory when necessary.

All participating SPs must submit a forecast at least 66 days prior to initially joining the pool, and on a semi-annual basis thereafter.
Failure to submit a forecast may result in the SP not being permitted to obtain resources from the pool for a period up to 66 days from the time a forecast is submitted, depending on the availability of resources in the industry inventory.

Information furnished by block holders shall be submitted on the forecast form provided in Appendix XX. This data will be used by the PA to develop a composite forecast for the pooled area. The PA will utilize the composite forecast to determine when additional resources are required for the industry inventory pool. It will also be used in determining critical industry inventory insufficiency within a specific rate center. This composite forecast will also be submitted by the PA to the CO Code Administrator for use by the NANPA in annual COCUS studies for projecting NPA exhaust. All forecast data will be treated in a confidential manner.

When the industry inventory is not adequate to meet participating service providers' forecasted block demands, the PA will request additional NXX codes, as outlined in Section 8.3 Replenishment of Industry Pool Inventory, from the Code Administrator.

6.2 Utilization Reporting Process

Thousand Block Number Pooling - Utilization Reports and Reporting

Requirements

A semi-annual reporting interval is required for the submission of utilization data. Consideration should be given to SP response time to a utilization report request. The PA will issue a request for utilization data at least two months prior to the due date.

Utilization reports shall not be required more frequently than semi-annually, unless requested by the PA for a specific need. In this instance, the PA will notify all SPs participating in the pooling area and provide a reasonable interval for SP response (i.e., 1 month or more).

Service Providers will submit the data using the Thousand Block TN Utilization Report (Attachment X).

The Pooling Administrator can use the Thousand Block Utilization reports for various aspects of thousand block administration. Uses for utilization reports include, but are not limited to the following:

- to determine basis for block reclamation in accordance with Section 10.4
- to test the reasonableness of service provider(s) forecast data
- to adjust/replenish a rate center industry pool(s), in accordance with Section 5.2, Item c.
- to provide reports to the industry, NANPA, regulatory authorities, etc., in accordance with Section 5.4
- to assist in auditing
- The report format used to report Thousand Block TN Utilization shall contain the following information: Company Name, OCN, Date of Report, LERG Rate Center, NPA-NXX, Range, TNs Unavailable, indicator for reporting partial data, e.g., Type I interconnection (Refer to worksheet specifications for descriptions of these data elements).

Reporting Requirements:

- Submit a separate electronic Excel spreadsheet for each NPA in the format indicated in the attached report form to the PA.
- The report form will be available electronically from the PA and will be pre-populated with the rate center name as it appears in the LERG.
- Data should be input as raw data.
- Utilization data is required for each block(s) assigned with the service provider OCN as defined in LERG.
- Block holders are responsible for identifying on the utilization report form Type 1 interconnection service providers using their numbering resources. [CHECK FOR LEGAL IMPLICATIONS]
- Service providers using partial number blocks for Type 1 interconnection are responsible for utilization reporting on their numbers.

- For utilization reporting purposes see Section 3.1 for those TNs defined as " Unavailable."

7.0 Reservation of Industry Inventory Blocks for Service Providers

Service Providers may have reason to reserve blocks for their future use. This section outlines the processes for block reservations.

7.1 Criteria for Approval

a) To reserve a block, block applicant must demonstrate that the block is essential to accommodate technical, e.g., switch, network element, or planning constraints or pending regulatory approval of a tariff and/or certification/registration.
b) When the applicant has provided a proposed use date within 6 months, if regulatory approval is pending, the applicant must certify and provide, if requested, appropriate documentation that a request for regulatory certification/registration has been submitted to the appropriate regulatory body to provide service.
c) The applicant must also meet the requirements for block assignment as outlined in Sections 2, 3, 4 and 9.
d) Specific blocks cannot be reserved to satisfy requests for vanity numbers.

7.2 Time Frames and Extensions

If a reserved block is not assigned within six months the block will be released from reservation and returned to the pool.

Reservations may be extended under the following circumstances:

a) When the proposed block effective use date will be missed due to extenuating circumstances (e.g., hardware/software provision delays, regulatory delays, etc.), then upon written request to the PA, one reservation extension of 3 months may be granted.
b) When the reservation extension requirement was due to technical constraints (e.g., equipment limitations) solely, the reservation may be extended until the constraint is no longer present.

8.0 Industry Inventory Pool

The industry inventory pool requires sufficient 1000 blocks to supply the 9-month inventory level it is to sustain. The quantity of these 1000 blocks should be determined based upon:

- the number of service providers participating in a given rate center
- the individual forecasts provided by each of the pooling participants
- the anticipated rate of assignment of the 1000 blocks within the pool
- a minimum reserve of at least six months in the pool at all times

8.1 Initial Pool Establishment Process

8.1.1 Outline of Implementation Timeframe

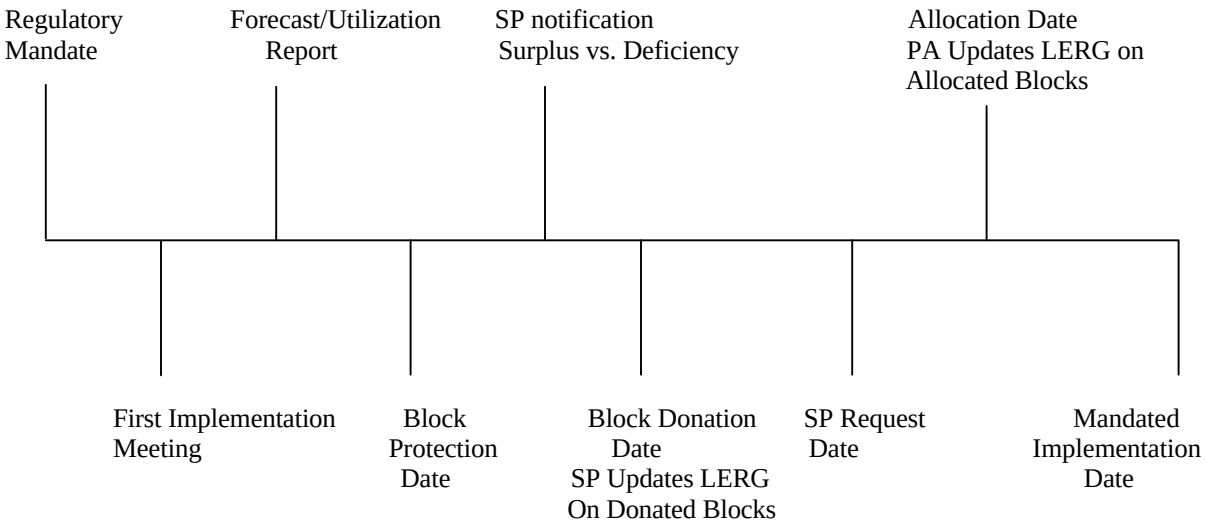
Upon regulatory direction, the PA will obtain a list of service providers that have LNP capable switches in the geographic area where Number Pooling is to be implemented. The PA will then schedule a Number Pooling Implementation meeting and assure the service providers are aware of their requirement to participate in Number Pooling and encourage their participation in the implementation meeting.

The PA will then develop the Number Pool Implementation Timeline, identifying the timeframes that service providers will be required to meet in order to implement Number pooling by the Pool Implementation Date.

The PA determines the dates of the milestones on a timeline for pool activation. These dates should be based on the directives provided by the regulatory body and based on input from participating service providers. This timeline should include the following as depicted in Figure 1:

- Initial Implementation Meeting - The meeting held by the PA for all participating service providers to develop time intervals between milestones.
- Forecast/Utilization Report Date - The deadline for service providers to report their forecasted demand and utilization information for all allocated NXX resources.
- Block Protection Date - The deadline for service providers to “protect” specified blocks (those with up to 10% contamination) from further contamination.
- Block Donation Identification Date - The deadline for service providers to report their surplus/deficiency of blocks to the PA. At this point, the service provider will specify which blocks will be donated.
- Block Donation Date - The deadline for service providers to donate their blocks. Intra-Service Provider porting of all contaminated TNs within all 1000 blocks that are being donated to the industry pool by SPs is to be completed by the block donation date.
- Pool Start Date - The date -the PA may start allocating blocks from the pool to service providers. This is also the start date for service providers to send requests to the PA.

Figure 1. TIMELINE FOR ESTABLISHMENT OF INVENTORY



8.1.2 The PA will hold at least one public meeting with all service providers expected to participate in number pooling. This meeting is to develop, by industry consensus, the intervals between the milestones listed above in order to finalize the Timeline for Establishment of Industry Inventory (Figure 1). Service providers will be informed of the requirements for number pooling (including both initial and subsequent forecast/utilization reports, block protection, block donation, etc.) and will have the opportunity to ask clarification questions regarding this process. The time interval from when SPs protect blocks (Block Protection Date) to when they donate them (Block Donation Date) requires considerable verification work by SPs so that all unavailable TNs are identified (see Section 8.1.7). The length of this interval should depend upon the quantity of contaminated blocks to be donated.

8.1.3 When providing utilization data in the forecast utilization report requested by the PA, service providers will identify which NXXs have been assigned to them in each rate center within the geographic area that will be required to implement number pooling. LINUS data may be used for the utilization information if timely and appropriate.2

8.1.4 Service providers are required to protect 1000 blocks with 0% to 10% contamination from further contamination after the Block Protection Date, unless the service provider does not have adequate supply in their service provider inventory to fill customer requests (this does not include a request by a customer for a vanity number).

2 LINUS (Line Number Utilization Survey) is a mechanism under consideration for the industry to determine the rate of numbering exhaust for numbers at the CO Code level, the NPA level, and life of the NANP.

8.1.5 Service providers will identify which, if any, blocks will be available for donation to the industry inventory. The service provider should also provide a summary by rate center whether they will have a surplus or deficiency of 1000 blocks, so the PA can quickly determine the aggregate supply (or deficiency) of the industry inventory.

Participants shall identify, and submit to the PA, all blocks, which have no more than 10 % contamination (including zero). Of those blocks, participants may retain identified blocks if the provider can certify that:

1 existing blocks are required to meet the service provider's 9 month projected forecast, or
2 there are technical reasons which justify retaining the blocks.

Retention of these blocks is subject to audit and appeal procedures.

8.1.6 The PA will evaluate on a rate center by rate center basis whether there will be enough blocks donated to create an industry inventory with enough supply to meet the aggregate forecasted demand for numbers for 9 months beyond the Pool Start Date. If the PA believes there will be insufficient supply to meet this demand, the PA will request additional NXX codes in an expedited manner to assure adequate supply exists prior to the Pool Start Date (See Section 8.3? for process to select a LERG assignee). If the PA determines there is an excess supply beyond the 9-month inventory level, any full NXXs in the excess will be returned to the CO Code Administrator and any individual blocks will be kept in the industry inventory pool.

8.1.7 Service providers are required to verify available numbers in blocks which they intend to donate to assure they are not assigned in switches, billing systems, etc. and that they are, in fact, non-working telephone numbers. The service provider will complete intra-service provider ports on unavailable numbers in contaminated blocks which they're donating, including numbers assigned to resellers, Type 1 providers, etc., by the block donation date. SPs are required to document to the PA that activities required in the block donation phase have occurred. NOTE: The porting of contaminated TNs in advance of the Pool Start Date will allow the recipient block holder the ability to determine which numbers are contaminated upon allocation of the block.

8.1.8 Service providers are required to donate protected 1000 blocks at the block donation date. Intra-Service Provider porting of all contaminated TNs within all 1000 blocks that are being donated to the industry pool by SPs is to be completed by the block donation date. SPs will document to the PA that activities required in the block donation phase have occurred. Service providers should not donate any blocks, which will be required to maintain their inventory for 9 months beyond the Pool Start Date. Additionally, service providers are

required to have updated LERG with information on blocks within pooled NXXs, which are not donated (i.e., those blocks within pooled NXXs that will be retained by the donating SP). The minimum interval between the block donation date and the Pool Start Date is 30 days if no new NXX is required to attain these levels. The interval will be 66 days if one or more NXXs are required.

8.1.9 The PA will allocate donated blocks to requesting service providers beginning on the Pool Start Date. This will ensure there is sufficient supply in the industry inventory to assure all service providers have their requests filled.

8.1.10 In instances where a pooled contaminated telephone number is assigned to more than one customer served by separate service providers (i.e., block holder and LERG assignee) due to an error made by the LERG Assignee in the population of contaminated numbers in the LNP data base at the time of donation, the customer of the original service provider (i.e., the customer to whom the number was originally assigned) shall retain assignment of the telephone number. The customer of the block holder shall provide their customer with a new telephone number.

8.2 Ongoing Administration

Should a rate center be altered (e.g., consolidated, boundary change) a pooled environment, the PA will implement the steps outlined in the initial establishment process (section 8.1).

The size of the industry inventory pool will be a 9-month supply for each rate center. The service provider's inventory for each rate center should also be a 9-month supply.

8.3 Replenishment

8.3.1 The PA shall monitor the supply of available blocks in the industry inventory for each of the rate centers being administered. This includes, but is not limited to, anticipating the demand upon the pool, replenishing the supply based on forecasts, and meeting SP requests that cannot be filled from available blocks in the pool.

Service providers will not be required to donate contaminated blocks for ongoing replenishment of the industry pool.

New NXXs will be used to replenish the industry pool after the initial industry pool has been established. Blocks reclaimed by the PA will be used to replenish the industry inventory pool. Service providers may also voluntarily return blocks to assist in replenishment of the industry inventory pool. Service providers should first return all uncontaminated blocks before returning any contaminated blocks for industry inventory replenishment. For reclamation procedures, see Section

10.

Prior to requesting a new NXX(s) from CO Code Administrator to replenish the industry inventory, the PA could request from SPs the voluntary return of any clean blocks or clean NXXs within their SP Inventory which are not required based on their 9 month inventory forecast.

8.3.2 The following provides the process flow and activation procedures for addition of CO Codes in order to provide additional blocks to the Industry Inventory Pool to meet immediate or forecast demand:

- Step 1 - PA utilizes service providers' forecasts to determine that additional blocks are required to maintain a 9 month supply for the industry inventory for a specific rate center. Additionally, the PA may require new NXXs to replenish the pool to meet a service provider's request that cannot be filled from blocks available in the pool.

- Step 2 - The PA selects a LERG assignee for growth codes to be added to the pool. The LERG assignee receives a block(s) upon being selected. If a request is for a customer dedicated NXX code, the requesting service provider will be the LERG assignee. The PA will follow the order below to select a LERG assignee. The confirmed LERG assignee will provide the PA with necessary information (re-address CO Code Guidelines).

  1 A SP requiring an LRN.
  2 A SP volunteering to be the LERG asignee.
  3 A SP on a rotating basis, until all participating service providers are the LERG Assignee for at least one NXX residing within the industry inventory pool.
  4 After each participating service provider is a LERG assignee for at least one NXX, participating service providers with a forecasted need will be selected on a rotational basis. A service provider with a forecasted need cannot refuse to become a LERG assignee, except for technical limitations or if any service provider is a LERG assignee for greater than 50% of the pooled NXXs within that rate center.

- Step 3 - PA sends a request to CO Code Administrator for new NXX(s) for that specific rate center. When the PA is unable to fill a service provider request, an expedited request for the CO code must be initiated within two business days. Included in the request will be the selected LERG Assignee and effective date (address CO Code Guidelines, including expediting activation).

- Step 4 - CO Code Administrator reviews request and, within 14 calendar days, notifies the PA of the NXX(s) assignment.

- Step 5 - CO Code Administrator inputs LERG assignee information into the ACD screen of RDBS, using CO Code Assignment Part 1 form data (NPA, NXX, OCN, Effective Date.).

- Step 6 - Upon receipt of the NXX assignment from the CO Code Administrator, the PA informs the LERG assignee of the NXX and block(s) assigned (how will notification occur - Part 3 of Block Assignment Request).

- Step 7 - Within 7 calendar days of notification by PA, the LERG Assignee, or their designee, inputs Part 2 information from the CO Code Assignment forms into RDBS and BRIDS.

9.0 Allocation of Blocks

9.1 Criteria for Block Allocation

The following criteria shall be used by the PA in reviewing a block request from a SP.

a) Requests for block assignments shall not be made more than 9 months prior to the requested effective date.
b) The applicant must be licensed or certified to operate in the area, if required, and must demonstrate that all applicable regulatory authority required to provide the service for which the 1000s block is required has been obtained.
c) The applicant must certify a need for a 1000 block(s).
d) Multiple blocks may be requested on one application form. The application form is structured per switch, per rate center.
g) The applicant should have requested their own contaminated block from the pool.
h) The service provider could have refused the assignment of a block when the block did not meet their technical limitations and/or administrative constraints.
i) Blocks shall not be allocated to satisfy requests for vanity numbers.
j) The block application must be accompanied by a forecast and any applicable utilization information.

9.2 Block Application Process

9.2.1 The applicants for block assignments shall submit their requests to the PA using the Number Pooling (NXX-X) Assignment Request and Confirmation Form (Attachment X). Electronic transfer or e-mail will be accepted as “official signature”.

9.2.2 The applicant should indicate on the form if any block (i.e., 0-9) is acceptable or whether, for technical limitations and/or administrative reasons, only certain blocks may be assigned. Specific blocks may be requested on the application. The applicant may also indicate a requirement or a preference for sequential numbering resources.

9.2.4 Applicants requiring an effective date more than 28 days after the date the PA receives the application should specify their desired effective date. An application without an effective date will be assigned the standard PA-assigned minimum effective date of 21 days after the allocation date. The PA shall always assure a minimum of 21 days between the allocation date and the effective date, unless requested otherwise through the expedite process (see Section 9.6).

This 21 calendar day interval is necessary because of some service provider's internal company notification process, etc. It should be noted that interconnection arrangements and facilities need to be in place prior to activation of a block. Such arrangements are outside the scope of these guidelines.

9.2.3 The PA receives the block request (Part 1) from the SP. Additional information and/or dialogue may be required by the PA to facilitate application processing. The PA is required to respond within 7 calendar days.

9.3 Process for Allocation of Blocks

9.3.1 Initial Allocation of Block(s) to a Service Provider without Numbering Resources in that Rate Center.

A service provider entering the pool with no numbering resources within the rate center is required to provide the PA a forecast prior to the allocation of a block(s) as detailed in Section 6. Utilization criteria will not be used to justify the allocation of initial block(s). The PA will allocate the appropriate number of blocks to the new service provider based on its request as detailed in Section 6. The PA may review any application for reasonableness and request additional information from the applicant as necessary.

9.3.2 Initial Allocation of Block to a Service Provider with Numbering Resources in that Rate Center

A SP entering an established pool, who has numbering resources within the rate center will, prior to requesting numbering resources from the pool:

a) Provide a utilization forecast
b) Donate blocks to the industry inventory pool as outlined in Section 8.

9.3.3 The start-up need for an initial block assignment will be based upon one of

the following:

a) identification of a new switching entity, or
b) identification of a new physical point of interconnection (POI), or
c) a specific business requirement.
f) If the applicant is deploying a new switching entity/POI that requires the assignment of an LRN, the block applicant will indicate on the request form the need for assignment of a new NXX. The requesting SP becomes the LERG assignee. In instances where the applicant does not designate a particular rate center for LRN assignment purposes, the PA should recommend and gain the SPs concurrence regarding which rate center should be used for assignment of an NXX in order to obtain an LRN and ensure efficient utilization of numbering resources.

9.3.4 For additional block allocation, the following applicable criteria shall be used by the PA in reviewing a block request from a SP.

a The applicant must certify that existing numbering resources do not reasonably meet their requirements. Each block holder will certify that existing blocks for the switching entity/POI, per service provided by that switching entity/POI, will exhaust within 9months. The quantitative information required for an additional block(s) request is "The Months to Exhaust Certification Worksheet." The block applicant should retain a copy in the event of an audit or regulatory initiative. In addition, the block holder must be prepared to supply additional supporting information, including the "Months to exhaust Worksheet" to the PA:

1) telephone numbers (TNs) available for assignment
2) incremental growth history of new TNs for the past 9 months (does not include ported-in TNs)
3) projected incremental demand for TNs in the next 9 months

b The PA should select the specific block for assignment based upon the following:

1. the service provider's donated contaminated blocks,
2. requests for specific contaminated blocks,
3. other contaminated blocks
4. applicant request for a specific uncontaminated block,
5. available uncontaminated blocks (first attempting to use the 0,0,1,8, and 9 thousands blocks).

c) The applicant certifies that an additional block(s) is necessary when currently allocated telephone numbers/blocks cannot be utilized because of a technical limitation or administrative constraint. Some examples of the limitation or

constraint are: limitations on Customer Premise Equipment (CPE); service provider internal block administration restrictions (i.e., administration of a thousand block across multiple switches within a rate center); potential situations such as unique AIN triggers.

9.3.5 The PA is responsible for updating the Assigned Code Record (ACD) screen in RDBS/BRIDS with the required block information. Required block information includes the following data elements: OCN of the block holder, the 1000 block line range, and block effective date.

9.3.6 The SP, or their designee, is responsible for inputting any necessary information from Part 1 ***[Proposed: and Part 2]*** of the into RDBS/BRIDS within 7 days of the PA updating the ACD screen.

9.3.7 The PA issues the block notification (Part 3) to the SP and to the NPAC as confirmation of block allocation.

9.3.8 When a contaminated block is allocated, the PA will notify the block applicant that the allocated block(s) is contaminated. The block applicant is responsible for obtaining a list from the LNP databases of working Telephone Numbers within the contaminated block that are not available for the block applicant's use.

9.3.9 A block assigned to a SP should be activated within 9 months after the date the block was allocated by the PA to the SP. Certification of activation will be required (see Number Pooling (NXX-X) Assignment Request and Confirmation Form - Part 4). If the PA does not receive Part 4 within the 9 month interval, the PA should begin the reclamation process. If the SP identifies that they will not meet the 9 month deadline due to circumstances beyond their control, the SP may request an extension as defined in Section 10.

9.4 Block Transfer Process

9.4.1 The assignment criteria in the following section shall be used by the PA when reviewing a request from a SP to transfer a 1000 block from the current block holder to the SP making the transfer request. These criteria will apply when the transfer of a block has been made from one SP to another SP and the full block is assigned and/or reserved to a single end user customer.

9.4.2 All time intervals applicable to the assignment of a new block apply in the case of a transfer. These intervals do not address the time intervals needed to perform the network and other rearrangements associated with the transfer.

9.4.3 The following criteria will be used by the PA in reviewing a block transfer request:

a) The applicant (SP receiving the block to be transferred) must submit a complete “name that form”. In addition to the “form”, the applicant requesting the block transfer must also provide written certification in which the current block holder agrees to the transfer.
b) Upon confirmation from both parties, if necessary, the PA will modify the ACD screen in RDBS/BRIDS for the block to be transferred to reflect the OCN and AOCN of the service provider to which the code will be transferred. To the extent necessary, the PA will coordinate the change with Bellcore TRA.
c) The PA will notify the recipient SP when the ACD screen has been successfully modified. It is the responsibility of the SP receiving the block to arrange for the entry of any changes to RDBS and BRIDS data associated with transferring the block.

9.5 Ongoing Administration of Allocated Blocks and Notification of LERG Changes

9.5.1 The information associated with a block assignment may change over time. Such changes may occur, for example, because of the transfer of a block to a different switching entity within the same rate center. The PA must be notified of any changes to the information on Part 1 of the NXX-X Block Assignment Request Form. This includes changes such as, but not limited to, OCN or switching entity/POI. For data integrity reasons, the PA must be informed of these types of changes to ensure that the record of the entity responsible for the block and the data associated with the block is accurate.

9.5.2 It is the responsibility of the block holder to arrange for the entry of any changes to RDBS and BRIDS data associated with a switching entity/POI.

9.5.3 The resulting service provider in a merger/acquisition must revise and provide a new, consolidated forecast for numbering resources. The holder of a NXX-X block assigned by the PA or acquired by other means such as transfer (e.g., by merger or acquisition) must use the block consistent with these guidelines. Additionally, the new block holder must participate in the audit process.

9.6 Expedite Process for Block Allocation

A request for an expedited block allocation will occur on an exception basis. The following procedures enable a SP to request an expedited allocation of a 1000 block(s). The expedite procedures below do not eliminate the block holder and PA responsibilities above (e.g., ACD screen, Part 1-4 completion, RDBS/BRIDS update, etc).

a) An SP may send a request to the PA requesting an expedited allocation of a 1000 block(s).

b) The requesting service provider will indicate on the 1000 block application that this is an expedited request for an allocation with their desired effective date.

c) The PA will process this application if the request meets the criteria for the allocation of the block(s) and will make every effort to process the application in fewer than the current 7 calendar days. The PA will expedite such requests when it can do so without failing to meet its 7 calendar day allocation interval for other service providers.

d The PA will determine the minimum effective date based upon the following considerations:

1 If the block applicant is the LERG Assignee, the effective date must be at least two calendar days after the allocation date. This allows for the SP to update RDBS/BRIDS and for LERG daily update.
2 If the block allocated requires NPAC notification (i.e., the requesting SP is not the LERG Assignee) and is the first "port" within the NXX, the effective date will be no earlier than 6 days after allocation.
3 If the block allocated requires NPAC notification but is not the first port, then the effective date will be at least two calendar days after the allocation date. This allows for the SP to update RDBS/BRIDS and for LERG daily update.

e) The SP will activate the block and can begin customer assignments as soon as all NPAC processing and notification has occurred.

NOTE: SPs requesting an expedited assignment of 1000 block(s) should be aware that there are potential impacts to SPs and customers. This may affect customer service to the extent that a SP is unable to identify the SP to whom a block has been assigned when responding to a customer trouble report.

10.0 Reclamation and Return of Blocks

The following sections outline the various responsibilities of the block holder, and the pooling administrator with respect to the reclamation and return of blocks of numbers under a pooling arrangement. In addition, the various circumstances under which reclamation and return of blocks can be initiated are enumerated in this section.

10.1 Assignee/Block Holder Responsibility

If the LERG Assignee no longer provides service (nor has LRN) in the rate center associated with the NXX, the service provider must notify the PA to assign a new LERG Assignee.

It is expected that return of a SP's blocks within this process will occur within 30

calendar days from receipt of the reclamation request from the Pooling Administrator.

10.2 The entity to which a block(s) has been assigned from the pool shall return the block(s) to the Pooling Administrator if:

a It is no longer needed by the entity for the purpose for which it was originally assigned
b) The service it was assigned for is disconnected,
c) The block(s) was not activated within the timeframe specified in these guidelines

10.3 If the block(s) was not activated within the timeframe specified in these guidelines, the assignee may apply to the Pooling Administrator for an extension date. Such an extension request must include the reason for the delay and a new activation time commitment.

10.4 Pooling Administrator Responsibility

The Pooling Administrator will contact any block assignee identified through the utilization report as not having returned to the administrator for reassignment any block(s):

a) Allocated, but no longer in use by the assignee(s),
b) Allocated for a service no longer offered,
c) Allocated, but not activated within the timeframe specified in these guidelines,
d) Allocated, but not used in conformance with these assignment guidelines,

The administrator will seek clarification from the assignee(s) regarding the alleged non-use or misuse. If appropriate, the PA will extend the activation date up to 90 days. If no satisfactory explanation is provided, the administrator will request a letter from the assignee(s) returning the assigned block(s). If a direct contact can not be made with the assignee(s) to effect the above process a registered letter will be sent to the assignee(s) address of record. The letter will request that they contact the administrator within 30 days regarding the alleged resource non-use or misuse. The block will be made available after 30 days for assignment.

10.5 Whether a block is reclaimed or voluntarily returned, the PA is responsible for removing the block assignment from the RDBS/BRIDS data base (ACD record). This information includes the following data elements: OCN of the block holder, the 1000 block line range, and block [effective date].

11.0 Jeopardy Situations

11.1 NPA Jeopardy Situations

When it is determined by the Code Administrator(s) based on the NPA Code Relief Planning Guidelines (INC 94-1216-004, check this number) that an NPA is in jeopardy3, the PA will participate in the NPA jeopardy activities. The pool participants are encouraged to also participate.

11.1.1 The following are special conservation procedures that will be invoked in the situation of a jeopardy NPA.

A. During the special conservation period, the PA will treat all code requests in a fair and impartial manner, consistent with the special conservation provisions.

B. Upon receipt of the notice of the jeopardy situation from the Code Administrator and/or PA, each block holder will review their forecast and demand data and provide the information to the PA within 30 days using the Utilization Report and Forecast Forms (Appendix X) unless the Block Holder has already provided such information to the PA within the past 30-day period.

C. For additional growth thousand blocks, each block holder will certify that existing thousand blocks for the switching entity/POI, per service provided by that switching entity or POI, will exhaust within 6 months. Block holders will have documented and must provide the “Months to Exhaust Certification Worksheet” containing:

1 TNs available for assignment
2 Growth history for 6 months
3 Projected demand for the coming 6 months (See Appendix ???B).

D. For blocks reserved per Section 7.0:

1 Holders of reserved blocks will be asked to voluntarily return their blocks or confirm their proposed use date. See Section ???
2 Reservations with proposed use date beyond the "NPA relief date" will be reviewed and filled, with resources made available as a result of NPA relief.
3 Reservations with proposed use date prior to the "NPA relief date" will not be honored if doing so would preclude the assignment of a block resource for which a certified request has been processed.

---

[3] A jeopardy NPA 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 new NPA will satisfy the need for new NXX(s) codes.

4 In this situation, reservations with the latest proposed use date will be the first blocks to be used for assignment, and the reservation will be canceled.

E Requests for assignment of blocks for other than growth or to serve a new switching entity/POI should be minimized. However, applications for such purposes can be submitted to the appropriate regulatory authority or their designate. If the appropriate regulatory authority or their designate decides that a special purpose block is warranted, the PA will make the assignment. The decision to postpone or withdraw a block request is the block applicant's responsibility and must be submitted in writing to the PA.

11.1.2 Unique circumstances within a given jeopardy NPA may require extraordinary NPA-specific pooling conservation procedures. In this event, the following activities shall apply.

A The PA shall work in conjunction with the CO Code Administrator and the affected parties to develop:
1 NPA-specific CO Code conservation procedures;
2 NPA-specific pooling conservation procedures.

B The PA will monitor changes in the jeopardy situation using the Utilization Report and Forecast Forms. Based upon the results of the analysis, the PA will;

1 implement each pooling conservation procedure as required;
2 Notify the affected parties and the CO Code Administrator of the implementation .

11.2 Critical Industry Inventory Insufficiency

A Critical Industry Inventory Insufficiency exists for a rate center when the available resources in the industry pool for a particular rate center fall below the actual and/or forecasted demand for the next 66 calendar days. The PA:

A will continue to assign blocks on a first come, first served basis.
B will allow existing block reservations to continue
C will not allow new block reservations to be made.
D should not reduce service provider pools to replenish the industry pool.

12.0 Process for Auditing Service Providers

(Agreement reached September 3, 1998 to suspend work on Section 12 of these

guidelines pending receipt of the Audit Framework from the NANC NRO/NANPA Oversight Working Groups …..Audits are appropriate per letter dated July 30, 1997 from NANC Chairman to INC Moderator)

The PA may arrange for and/or perform audits of service provider utilization of assigned resources, as required.

13.0 Appeals Process

Disagreements may arise between the PA and block holders/applicants in the context of the administration of these guidelines. In all cases, the PA and block holders/applicants will make reasonable, good faith efforts to resolve such disagreements amongst themselves consistent with the guidelines prior to pursuing any appeal. Appeals may include but are not limited to one or more of the following options:

- The block holder/applicant will have the opportunity to resubmit the matter to the PA for reconsideration with or without additional input.

- Guidelines interpretation/clarification questions may be referred to the body responsible for maintenance of these guidelines, currently the INC. Unless otherwise mutually agreed to by the parties, these questions will be submitted in a generic manner protecting the identity of the appellant.

- The PA(s) and block holders/applicant may pursue the disagreement with the appropriate regulatory authority or their designate.

APPENDIX XX

Worksheet Specifications:

"Sheet 1" of the workbook titled "**Thousand Block TN Utilization Report"**

Location	Column Name	Data Description
A1	Company Name	Company Name
B1	OCN	Operating Company Number
C1	Date	Date Submitted
A2	LERG RC	The Local Exchange Routing Guide (LERG) rate center name
B2	NPA-NXX	The NPA and Central Office Code/NXX by rate center
C2	RANGE	1. The range of TNs assigned to the service provider within each NXX for which utilization data is being provided. (See example 999-222-4000-4200) 2. The range of TNs if any assigned to a Type 1 interconnect service provider for which that service provider has utilization reporting responsibility. (See example for 999-222-4201-4999)
D2	TNs UNAVAILABLE	The number of TNs which are unavailable
E	Type 1 SP Name	Company Name of Type 1 service provider to whom the identified range of TNs has been assigned.

APPENDIX XX

Thousand Block Forecast Demand Form

Company:

NPA Rate Centers	Forecast 1998					1999				
	1st Qtr	2nd Qtr	3rd Qtr	4th Qtr	Total	1st Qtr	2nd Qtr	3rd Qtr	4th Qtr	Total
A Rate Center					0					0
B Rate Center					0					0
C Rate Center					0					0
D Rate Center					0					0
E Rate Center					0					0
F Rate Center					0					0
G Rate Center					0					0
H Rate Center					0					0
I Rate Center					0					0
J Rate Center					0					0
K Rate Center					0					0
L Rate Center					0					0
M Rate Center					0					0
N Rate Center					0					0
O Rate Center					0					0
P Rate Center					0					0
Total 98=	0	0	0	0	0	Total 99=	0	0	0	0	0
Q Rate Center					0					0
R Rate Center					0					0

	1st Qtr	2nd Qtr	3rd Qtr	4th Qtr	Total 98	1st Qtr	2nd Qtr	3rd Qtr	4th Qtr	Total 99

Prepared By:
Date:

APPENDIX XX

COCUS FORM TO POOL ADMINISTRATOR

SERVICE PROVIDER:		
CONTACT:		**CONTACT TN:**
FAX:		**E-MAIL:**
DATE:	**NPA:**	**RATE CENTER:**

	ACTUAL (1)		**3 MONTHS**		**6 MONTHS**		**1 YEAR**		**15 MONTHS**		**18 MONTHS**	
	AS OF DATE:		**AS OF DATE:**		**AS OF DATE:**		**AS OF DATE:**		**AS OF DATE:**		**AS OF DATE:**	
	FULL NXX	**BLOCKS**	**FULL NXX**	**BLOCKS**	**FULL NXX**	**BLOCKS**	**FULL NXX**	**BLOCKS**	**FULL NXX**	**BLOCKS**	**FULL NXX**	**BLOCKS**
RESERVED	(3)	(2)										
LEC	(4)	(5)	(8)	(9)	(10)	(11)	(10)	(11)				
IXC	(4)	(5)	(8)	(9)	(10)	(11)	(10)	(11)				
TOTALS	(7)	(8)										

	2 YEARS		**3 YEARS**		**4 YEARS**		**5 YEARS**	
	AS OF DATE:		**AS OF DATE:**		**AS OF DATE:**		**AS OF DATE:**	
	FULL NXX	**BLOCKS**	**FULL NXX**	**BLOCKS**	**FULL NXX**	**BLOCKS**	**FULL NXX**	**BLOCKS**
RESERVED								
LEC								
IXC								
TOTALS								

INSTRUCTIONS FOR FILLING OUT THE COCUS FORM TO THE POOLING ADMINISTRATOR

NOTES

1 Total actual Blocks and full NXXs assigned to the Service Provider.
2 Blocks Reserved by the PA for the Service Provider, which are in the Industry Inventory Pool.
3 Full NXXs reserved by the PA for the Service Provider, which are in the Industry Inventory Pool.
4 Number of full NXXs assigned to the Service Provider.
5 Number of 1000 Blocks assigned to the Service Provider.
6 Total number of full NXXs assigned to the Service Provider.
7 Total number of 1000 blocks assigned to the Service Provider.
8 Number of additional full NXXs forecasted to be added within the next 3 months to the Service Provider's inventory.
9 Number of additional 1000 blocks forecasted to be added within the next 3 months to the Service Provider's inventory.
10 Number of additional full NXXs forecasted to be added to the Service Provider's inventory in this period. This is in addition to what was forecasted the previous 3-month period.
11 Number of additional1000 blocks forecasted to be added to the Service Provider's inventory in this period, This is in addition to what was forecasted in the previous 3-month period.

APPENDIX XX

Please complete the following form. Use one form per request, per rate center, per switch. Mail or fax the completed form to the Pool Administrator (PA).

The applicant is on notice that block assignments are granted subject to the conditions in the Thousand Block (NXX-X) Assignment Guidelines, which are available from the Pool Administrator.[1] In a non-jeopardy situation a block assigned to an entity, either directly by the PA or by transfer from another entity, should be activated within 9-months after the block was allocated by the PA to the SP.

These guidelines may be modified from time-to-time. The assignment guidelines in effect shall apply equally to all applicants and all existing block holders.

The applicant and the PA acknowledge that the information contained on this request form is sensitive and will be treated as confidential. Prior to confirmation this information only be shared with the appropriate administrators and/or regulators. Information requested for RDBS and BRIDS will become available to the public upon input into those systems.

I hereby certify that the following information requesting a block (NXX-X) is true and accurate to the best of my knowledge and that this application has been prepared in accordance with most current Thousand Block (NXX-X) Assignment Guidelines in effect.

It is understood that the applicant will return any block to the PA for reassignment in accordance with block recovery procedures outlined in the guidelines.

_____
Signature of Company/Entity Authorized Representative

_____
Title

_____
Date

1 The PA is available to assist in completing these forms.

1.0 GENERAL INFORMATION

1.1 Contact information:

Block Applicant

Company/Entity Name _____

Contact Name_____

Address_____

City, State, ZIP_____

Phone_____FAX_____ E-Mail _____

Pool Administrator

Name_____

Address_____

City, State, ZIP_____

Phone_____ FAX_____ E-Mail _____

1.2A Block request information when an LRN is needed

NPA _____ Number of Blocks Requested _____ LATA _____

OCN[2] _____ SPID ____

Switch Identification (Switching Entity / POI)3 _____

City or Wire Center Name _____

Rate Center[4] _____

Rate Center Sub Zone _____

Homing Tandem Operating Company[5] _____

Tandem Homing CLLI®[6]: _____

Route same as NPA____ NXX-X ____

Use Same Rate Center as NPA ____ NXX _____

1.2B Block request information with existing LRN

NPA _____ Number of Blocks Requested _____ LATA _____

OCN _____ SPID_____

LRN 10-digit Number _____

Rate Center _____

Switch Identification (Switching Entity / POI)[7] _____

1.3 Dates

Date of Application_____

Requested Block Effective Date _____

Activation Date Provided to NPAC By: SP_____ or, PA_____ (check one)[8]

---

2 Operating Company Number (OCN) assignments must uniquely identify the applicant. Relative to CO Code assignments, NECA-assigned Company Codes may be used as OCNs. Companies with no prior CO Code or Company Code assignments may 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.

3 This is an eleven-character descriptor of the switch provided by the owning entity for the purpose of routing calls. This is the 11 character COMMON LANGUAGE Location Identification (CLLI®) of the switch/POI.

4 Rate Center name must be a tariffed Rate Center.

5 Applies to Type 2A wireless, competitive service providers, or any block holder connecting to a Public Switched Telephone Network (PSTN) interconnecting carrier.

6 CLLI® code of PSTN interconnecting carrier switch/POI.

7 This is an eleven-character descriptor of the switch provided by the owning entity for the purpose of routing calls. This is the 11 character COMMON LANGUAGE Location Identification (CLLI®) of the switch/POI.

8 If the PA is checked then the activation date is the same as the effective date. If the SP is checked the activation date is set through the SOA by the SP.

Acknowledgment and indication of disposition of this application will be provided to applicant within ten working days from the date of receipt of this application.[9]

This application process assumes that the applicant will use SOA to input information into NPAC.

The requested block effective date should be on or after the effective date for the CO Code from which the block(s) will be allocated. Refer to the CO Code Assignment Guidelines and the Thousand Block NXX-X Assignment Guidelines for CO Code/Block Effective Date requirements.

9 An incomplete form may result in delays in processing this request.

1.4 Type of Entity Requesting the Block:

a) Local Exchange Carrier _____ CMRS _____
Interexchange Carrier _____ Other (specify)
_____

b) Type of service for which block is being requested:

_____

_____

c) Is certification or authorization required to provide this type of service in the relevant geographic area? Yes _____ No _____

(1) If no,
explain:_____

_____
_____

(2) If yes, does your company have such certification or authorization?

Yes ____ No _____

(i) If yes, indicate type and date of certification or authorization (e.g. regulatory authorization, license, tariff, etc.):

_____
_____

_____
_____

ii If no,

explain:_____

_____

_____

e Block(s) (NXX-X) assignment preference (optional)_____

_____

f Block(s) (NXX-X) that are undesirable for this assignment, if any_____

_____

1.5 Type of Request (Select One):

_____ Initial block NXX-X for new switching entity/POI requiring a LRN, (Complete Part 2)

_____ Block NXX-X request for new application for existing switching entity or point of interconnection (Applicant must complete Section 1.7)

_____ Additional block NXX-X for growth (Applicant must complete Section 1.6)

_____ Update information (Complete Part 2) (Block NXX-X) requiring update

_____ Block Reservation only:[10]

_____ Initial NXX-X

_____ New Application (Complete Section 1.7)

_____ Growth (Complete Section 1.6)

1.6 Additional Block NXX-X Request for Growth

Basis of eligibility for an additional NXX-X for growth assigned to the switching entity/POI assumes the following: the initial NXX-X or the NXX-X previously assigned to a new application meets the exhaust criteria as specified in the Thousand Block (NXX-X) Assignment Guidelines, depending upon whether or not an NPA jeopardy situation exists as described in Section 11 of the guidelines. The appropriate situation shall be indicated below (select one):

____ Non-NPA Jeopardy Situation

I hereby certify that the existing block(s) at this switching entity/POI is/(are) projected to exhaust within 9 months of the date of this application. This fact is documented on Appendix A (Months to Exhaust Certification Worksheet) and is available if requested.

____ NPA Jeopardy Situation

I hereby certify that the existing block(s) at this switching entity/POI is/(are) projected to exhaust within 6 months of the date of this application. This fact is documented on Appendix A (Months to Exhaust Certification Worksheet) and is included with this application.

1.7 NXX-X Request for New Application

Basis of eligibility for an additional block means that there has not been an NXX-

10 When the entity is ready to place the block in service, the entity should complete a new request form.

X assigned to this switching entity/POI for this purpose. (Check the appropriate space and, if applicable, provide the requested information).[11]

NXX-X is necessary for distinct routing, rating or billing purposes as described in Section 9.3.3 of the guidelines[12]

_____

_____

_____

_____

Other (explanation required) The applicant must provide an explanation of why existing resources assigned to that entity cannot satisfy this requirement.

_____

_____

_____

_____

1.8 Requirement for Central Office Code (NXX) Assignment Request Form, Part 2

This section applies if the applicant is requesting an LRN in Section 1.2A above, which will make the applicant the LERG Assignee. The LERG Assignee has responsibilities similar to those of an NXX Code Holder.

Please refer to the Central Office Code (NXX) Assignment Guidelines (INC 95-0407-008), especially Section 6, Responsibilities of Code Holders and Applicants.

Applicants are responsible for ensuring that Part 2 data is input into the Bellcore TRA databases.

11 If eligibility is based on a category that requires additional explanation or documentation and the PA denies a request, the applicant has the option to pursue an appeals process.

12 Any additional information that can be provided by the block applicant may facilitate the processing of that application.

Pool Administrator's Response/Confirmation

Date of Application _____ Block Effective Date _____

Date of Receipt _____ Date of Response _____

Service Provider Name_____

OCN-_____ SPID_____

Pool Administrator Contact Information:

_____ Phone _____
Signature of Pool Administrator

_____ Fax _____
Name (print)

E-mail _____

___ **NPA-NXX _____ Block(s) Assigned _____**

Block Contaminated (Yes or No) _____

Block Allocation Date _____

Block Activation by PA (Yes or No)_____

Switch Identification (Switching Entity / POI)[11] _____

Rate Center _____

Rate Center Sub Zone _____

___ **Block Reserved _____**

Date of Reservation _____

Your block reservation will be honored until_____

Switch Identification (Switching Entity / POI)_____

___ **Form incomplete**

Additional information required in the following section(s): _____

_____

_____

___ **Form complete, block request denied**

Explanation:_____

_____

_____

___ **Assignment activity suspended by the administrator**

_____

11 This is an eleven-character descriptor of the switch provided by the owning entity for the purpose of routing calls. It is the 11-character COMMON LANGUAGE Location Identification (CLLI*R*) of the switch/POI shown on Part 1 of this form.

Explanation: _____
_____

Further Action: _____
_____

___ **NPA in jeopardy: Yes _____ No _____**

If yes, refer to Section 11 of the assignment guidelines.

Remarks:

Confirmation of NXX-X Block Activation
(Unless this form is returned to the PA reclamation procedures may be initiated)

By signing below, I certify that the block(s) (NXX-X[s]) specified in Section 1 below is(are) in service and is(are) being used for the purpose specified in the original application.

_____	_____
Print Name of Authorized Representative of Company/Entity	Signature
_____	_____
Title	Date

1. NPA-NXX-X block(s): _____

2. Switch Identification (Switching Entity / POI)[12]:_____

3 Date block(s) put in service: _____

4 Date of Block Allocation:_____

12 This is an eleven-character descriptor of the switch provided by the owning entity for the purpose of routing calls. This is the 11-character COMMON LANGUAGE Location Identification (CLLI®) of the switch or POI.

Illinois Number Portability Workshop

Number Pooling Subcommittee

Report on Number Pooling

A report on the feasibility of implementing number pooling to relieve the pending exhaust of the 847 area code

September 2, 1997

Table of Contents

1. Executive Overview

The Illinois Number Portability Workshop established a Number Pooling Subcommittee (the Subcommittee) to assess the feasibility and practicality of implementing number pooling at the thousands-block level, using the AT&T NXX-X/LRN plan, to relieve the 847 NPA. The Subcommittee focused its efforts on potential impacts to the network, operations and current number administration. It acknowledged certain constraints to the application of number pooling, most notably that it would be limited to only wireline service providers whose networks were LNP-capable. As such, there may still be a significant, ongoing demand for full NXXs to accommodate the needs of wireless and other non-LNP capable service providers.

The Subcommittee's analysis revealed that the incremental impact of number pooling (over and above number portability) varied depending upon the component under study. The impact on end offices, Operator Services/Directory Assistance, 911, LIDB and rating and billing appear to be minimal. Its impact on other systems, such as NPAC interfaces, legacy provisioning and support systems (OSS) and LNP data bases is somewhat more significant. Most crucial was the potential impact on SCP record storage capacity. Since pooling relies upon the storage of number routing information within LNP data bases, it competes with service provider number portability-ported numbers for the same limited record capacity resource available in current SCPs. One of two methodologies for implementing number pooling could limit this capacity concern in the near term. However, this would require significant enhancements to several legacy OSS, which would then be abandoned or modified if and when the preferred long term methodology was employed.

Coincident with the impact assessment, the Subcommittee helped define and pursue a comparison of the forecasted demand with availability of numbers in a pooling environment. The results of that comparison revealed that number pooling, if implemented by 1/1/98, may extend the exhaust date of the 847 area code by six to twelve months.

Due to the significance of the record capacity and OSS concerns, the Subcommittee recommends that implementation of number pooling be delayed beyond 1/1/98, until solutions are identified and available. If current projections on the exhaust date of NPA 847 remain unchanged and or those solutions are not found, this may require the industry to pursue other measures of relief.

2. Background

The Illinois NANP Code Administrator has projected the exhaust of assignable Central Office codes (NXXs) within the 847 area code (NPA) to occur on or around the end of the second quarter of 1998. In anticipation of this exhaust, several meetings and conference calls have been conducted among Telecommunications Industry

Representatives and stakeholders to identify feasible alternatives to address this exhaust situation. The initial focus of these meetings was to analyze either an NPA split or an NPA overlay. An NPA split would reduce the area of coverage for the 847 area code, and introduce a new NPA code to serve the vacated portion. The latter would introduce a second area code within the same 847 NPA boundary, to serve all new customers of telecommunications services once the 847 area code was at total exhaust.

It is acknowledged that in a multiple NPA environment, each subsequent split diminishes the actual area of relief, and leaves other surrounding area codes with similar exhaust potential. NPA overlays offer the potential for wider areas of relief, since overlays can be used for more than one area code. However, overlays require mandatory 10-digit dialing within the affected area, even for calls within the same NPA.

In May, 1997, the Citizens Utility Board (CUB) proposed a third alternative, which utilized the soon-to-be-deployed local number portability (LNP) technology to offer a form of number pooling. The ATIS-sponsored Industry Numbering Committee (INC) describes Number Pooling as:

> *Pooling of geographic numbers in a local environment is a number administration and assignment process which allocates numbering resources to a shared reservoir associated with a designated geographic area.*

Based upon an AT&T proposal under study within several industry forums (i.e., NXX-X/LRN), this alternative would allow individual carriers serving the same rate center area to be allocated blocks of 1,000 numbers from the 10,000 available within the same NXX to serve new customers.

The Illinois Number Portability Workshop (The Workshop) has assigned responsibility for assessing the feasibility and practicality of implementing this form of number pooling as an appropriate relief alternative for the 847 NPA to the newly-formed Number Pooling Subcommittee. Specifically, they have been directed to determine whether the CUB/AT&T proposal can be implemented on or around 1/1/98 to relieve the 847 NPA. This report summarizes the research and discussions held over the past several months within this and other Workshop subcommittees on this issue.

3. Description of NXX-X/LRN

Role of the NXX in the North American Numbering Plan

The telephone numbering system used in North American countries is defined by the North American Numbering Plan (NANP). This Plan defines a 10-digit telephone number format of NPA-NXX-XXXX. The NPA (Numbering Plan Area) is more commonly known as the area code. The NXX identifies the central office (CO) switch or CO code to which the XXXX or line number is assigned. In the NXX and XXXX, N can be any digit from 2 through 9, and X any digit from 0 through 9. Taken together, the NPA-NXX code

combination is used to route calls within the public switched telephone network to line numbers on specific switches.

The NPA-NXX also performs a second function, which is call rating. Each NPA-NXX is associated with a specific geographic area within an NPA to which are assigned horizontal and vertical coordinates. These coordinates are used to determine the distance of a call between geographic areas of the originating and terminating numbers. A group of NXXs that have the same coordinates form a rate center. Historically, the distance, length of call, and time of day have been used to determine the price of the call. Such rating is done in real-time on operator-assisted calls.

The NPA-NXX performs yet a third function. Historically, people could distinguish between local calls and toll calls they originate by looking in the front of their telephone books for the list of NXXs that defined their local calling area. When a call is originated by a subscriber who has presubscribed to an interexchange carrier for intraLATA toll calls, the originating switch uses the NPA-NXXs of the originating and terminating numbers to determine, in real-time, whether the call is to be routed by the local service provider (LSP) to the presubscribed interexchange carrier. This is commonly referred to as toll discrimination.

NXX-X/LRN

NXX-X/LRN relies on the Location Routing Number (LRN) used for LNP. The NXX-X/LRN proposal conserves NXX codes by sharing them across several LSPs serving the same rate center(s). All ten thousand numbers within each NXX continue to be assigned to one rate center, but are shared among multiple LSPs at the thousands-block (NXX-X) level. An example of this arrangement is shown below:

847-999-1XXX	LSP-1
847-999-2XXX	LSP-2
847-999-3XXX	LSP-3
etc.	

Therefore, LSP-1, LSP-2, LSP-3, etc., can each assign numbers from their designated thousands-block within the 847-999 NPA-NXX, but only to customers residing within the designated rate center.

Significantly, the 847-999 NXX shown in the example might still be assigned in its entirety to one switch entity/one LSP within the Bellcore Local Exchange Routing Guide (LERG). The assigned LSP would be referred to as the code holder. The code holder, however, would only be permitted to assign numbers within the particular thousands-block or blocks that have been allocated to it. Other LSPs (blockholders) can assign numbers in their designated thousands-blocks, but must treat the assigned numbers as ported, and must populate them in the NPAC Service Management System (SMS).

4. Scope

This report provides a recommendation on the feasibility of implementing a near-term number pooling solution based on the NXX-X/LRN proposal to relieve the 847 NPA exhaust within the Chicago metropolitan area, starting in January, 1998. The recommendation is based on information from telecommunications industry participants and stakeholders who are participating in LNP implementation in the Chicago area.

Number conservation is both a state and national issue which is being addressed by the North American Numbering Council (NANC) and other telecommunications industry policy and technical forums across the country. These forums are reviewing several long term number conservation methods, including number pooling. Their review includes pooling at the thousands-block and individual number levels, as well as expanding the scope of pooling to beyond the same exchange/rate center.

Their review may not be finalized in sufficient time to provide relief for either the 847 or other NPAs requiring near-term relief. Therefore, the number pooling solution referenced in this report (i.e., specifically for the 847 NPA) should be viewed as a near term step. It has been suggested, however, that this near term solution may be applied to other NPAs, in the Chicago area or other areas of the country, that are LNP-capable. It should be noted that this solution only provides potential relief for situations where the existing area code is approaching, but not yet at, total exhaust. It may also provide a framework for developing standards and requirements for longer term, nationally consistent number pooling solutions, as well as a migration path to reach that objective.

5. Operational Assumptions

The following operational assumptions need to be in place prior to the implementation of the NXX-X/LRN solution.

- An NXX, as defined in the Local Exchange Routing Guide (LERG), should only be assigned to customers residing within the same rate center. As such, each NXX will continue to be associated with one particular rate center, and one particular switch. One purpose for the latter requirement is for default routing, 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.

- Switches that are assigned thousands-blocks from within shared NXXs must be LNP capable. This capability is needed to launch LNP queries on default-routed calls, and to properly process incoming calls that have been queried at another point in the call path.

- The implementation of number pooling should not accelerate the schedule for LNP deployment. Only those exchanges that were previously included in the initial

deployment of LNP within the boundaries of NPA 847 will be candidates for number pooling[1]. It is assumed that all NXXs within these LNP-capable exchanges will be opened, when needed , for pooling/portability.

- It is assumed that the current LNP timeline for the Chicago MSA targeted for completion 4th Quarter 1997 is met. Any delay in this timeline could seriously impair the ability of this alternative to forestall the exhaust date of 847 NPA.

- All service providers that are LNP capable in the 847 NPA, will participate in number pooling.

6. Numbering Constraints

In assessing the feasibility of employing this form of number pooling, to relieve the exhaust of the 847 NPA, many number administration and operational factors needed to be analyzed. These factors include:

- Resources made available through pooling (i.e., thousands-blocks)
- Forecasted demand for those resources
- Access to those resources by all service providers

In making such an assessment there was acknowledged need to determine the current number of spare thousands-blocks within the NXX assigned Rate Centers. Once that spare capacity was reported, new usage forecasts would be required from each carrier to determine whether those spare blocks resided in Rate Centers where there was an anticipated demand for more numbers. In addition, an assessment of which LSP networks and switches would be LNP capable by January 1, 1998 was needed to determine the amount of number pooling possible.

To determine number utilization within 847, the Illinois Commerce Commission Staff forwarded a data request to all LSPs on May 8, 1997, requesting them to report the amount of spare capacity on their 847 NXXs by May 30, 1997. The results of that survey indicated that there were 671 thousands-blocks that were totally spare, and an additional 185 thousands-blocks with 10 or less working numbers[2]. These blocks resided within 38 of the 42 wireline rate centers served by the 847 NPA. The above results were only for codes assigned to wireline carriers.

Absent an existing requirement to limit number assignments within working NXXs, a voluntary effort was needed to begin conserving numbers. The ICC Staff forwarded a second data request on July 10th, which asked all carriers to identify and restrict

[1] Wireline LSPs providing service within the 847 NPA may be asked to consider voluntarily accelerating their LNP deployment schedules in selected offices to accommodate number pooling.

[2] It has yet to be determined what amount of assigned numbers within a thousands-block should be used in deciding whether the block becomes a pooling candidate.

assignment within thousands-blocks currently containing 50 or less working numbers. As of the date of this report, commitments were made to restrict assignment within 543 currently vacant blocks, and to offer up 348 as pooling candidates. In addition, LSPs will restrict assignment within 330 blocks that have some working numbers, and to offer 182 of those blocks as pooling candidates. LSPs will be asked to report such availability on a monthly basis, until number pooling is implemented, at which time those blocks will be returned to the pooling administrator. It is recommended that this monitoring mechanism be applied to all users of NPA 847 numbering resources. It is anticipated that those blocks which are entirely vacant will be the first to be allocated by the pooling administrator.

To compare this spare capacity with the anticipated future demand for new thousands-blocks, a request for new forecasts was forwarded by Wallace Data Comp to all 847 NXX code holders on July 11th. LSPs were requested to report the number of additional thousands-blocks, by rate center, they would require to service new customers over the next two years. A compilation of the results of this forecast request provided new demand data in the level of specificity needed to complete the comparison.

The unavailability of the supporting number portability technology in certain networks and switches has been factored into this comparison. In the FCC order on number portability (CC Docket 95-116), Cellular and PCS carriers were not required to deploy LNP until June 30, 1999. Additionally, paging companies were excluded entirely from the requirement to deploy LNP. As such, wireless carriers will not be able to participate in thousands-block sharing until they are LNP-capable. Similarly, the FCC Reconsideration Order on Docket 95-116 limited wireline service providers' obligation to deploy LNP to only those exchanges where there was an expressed interest from competing carriers. Within the 847 boundary, a few exchanges were not included on the switch selection lists submitted by all service providers requesting number portability. These exchanges cannot be allocated blocks of numbers from other NXXs.

The final thousands-block comparison of forecasted demand, with availability, suggests that number pooling at this level may extend the exhaust date of NPA 847 by 6 to 12 months. This estimate is based upon the assumption that approximately 100 spare NXXs will still be available to serve the needs of non-LNP capable networks and exchanges. The projection for exhaust hinges heavily upon the accuracy of the LSP forecasts. Unanticipated demand from existing or new LSPs could significantly impact this estimate. Number pooling does not eliminate the need for continued code relief planning.

7. Network Impacts

The Illinois Number Pooling Subcommittee enlisted the help of several standing subcommittees of the Illinois Number Portability Workshop to assess the impact of this form of number pooling on various network components. Attention focused primarily on

end offices, the regional SMS (NPAC), individual carrier SCPs, and 911 systems. The following are the results of those assessments.

7.1. Regional NPAC/SMS

The Workshop's NPAC/SMS Subcommittee assessed the impacts of thousands-block pooling on the NPAC/SMS and associated administrative processes. Pooling itself is a numbering resource administration process that does not specifically involve the NPAC/SMS in performing number resource administration. In thousands-block pooling, a service provider may be assigned a thousands-block in an NXX for which they are not the LERG assignee. The NPAC/SMS would be used to port the numbers in that block into the block holder's network to enable them to provide service to those numbers. Thousands-block pooling does not involve significantly new NPAC/SMS capabilities, since pooling utilizes existing LNP capabilities. The NPAC/SMS is used to port numbers assigned as a result of pooling, and not the administration of the number pooling resource itself.

The NPAC/SMS Subcommittee identified a number of refinements to, and requirements for, the existing LNP process flows that would optimize the porting of pooled numbers and implement policy decisions related to the porting behavior of pooled numbers. The two policy issues are: at what point is a pooled number ported into the block holder's network; and does a disconnected number snap back (port back into) the block holder's network if that number had ported away into another provider's network prior to being disconnected?

To implement the refined process flows and pooling policy decisions requires enhancements to the NPAC/SMS software, which are currently slated for NANC release 2 development cycle. This release is scheduled for deployment on 2/21/98. To support pooling on 1/1/98 prior to this release, operations work-arounds would need to be implemented through methods and procedures to utilize existing NPAC/SMS functionality.

Regarding the question of when a pooled number is to be ported, two options have been identified: pre-porting and porting-on-demand. In pre-porting, the entire thousands-block of numbers is ported into the block holder's network subsequent to the block having been assigned, but prior to assigning or activating any of the numbers within that block. In porting-on-demand, the assigned block is left default-routed to the code holder's network (i.e., not ported) until the block holder assigns and activates numbers within that block. As numbers are assigned to end users, the block holder ports those numbers into their network at that time.

Regarding the question of disconnect treatment of a pooled number, the issue arises in the case of an active pooled number which subsequently ports away into another LSP's network. If the number then subsequently disconnects, the question arises as to what happens to the number. Three options have been identified: 1)

snap back to the block holder; 2) snap back to the code holder; and 3) no snap back. In snap back to the block holder, upon a disconnect processed at the NPAC by the last serving provider, the number is re-ported back into the block holder's network where vacant treatment is provided until they re-assign the number. In snap back to the code holder's network, upon a disconnect processed at the NPAC by the last serving provider, the number is un-ported to the code holder's network, returning the number to default routing. The first of these snap back options leave the number within the assignment authority of the block holder regardless of where vacant number treatment is provided. The second option could leave assignment authority with either the code holder or the block holder.. In the no-snap back option, no disconnect is sent to the NPAC, causing the number to remain in the last serving provider's network, where they provide vacant treatment and consider the number added to their inventory. This effectively transfers assignment authority of that number to the last serving provider's network.

Current NPAC/SMS functionality supports the porting of both individual numbers, as well as large blocks of numbers. Consequently, the baseline functionality exists to support either pre-porting or porting on demand. However, the current NANC process flows for porting numbers involve both old and new service providers due to the mutual coordination and provisioning activities that must occur between providers. These processes, for example, cause notifications to be sent to both old (code holder) and new (block holder) carriers' SOAs for each number ported. Since numbers ported due to pooling will be unassigned or vacant when ported, these notifications are less relevant or unnecessary in this case. When porting blocks of pooled numbers, as in pre-porting, these notification messages (per number) can become burdensome to both the NPAC/SMS and SOAs. The NPAC/SMS Subcommittee has developed streamlined process flows and procedures for the porting of pooled numbers to minimize this overhead. These flows are a variation of the existing process flows and procedures for an intra-provider port (LISP), and therefore require NPAC development.

The SCP subcommittee has identified concerns regarding SCP capacity resulting from the increased size of the LNP data base attributable to pooling (SCP capacity issues are addressed in Section 7.3). One SCP capacity management solution identified involves the use of bulk downloads from the NPAC/SMS to consolidate record storage by not populating individual TN records where the same routing information applies to a whole block or range of numbers. The porting of blocks of numbers at the NPAC is performed as an operation directed at a range of numbers. Upon activation of a block port, a bulk download operation is broadcasted to each subtending LSMS. The bulk download operation specifies a list of numbers included in the operation along with a single copy of the routing attributes to be used for the entire list of numbers. While the current bulk download operation in the NPAC/SMS interface, defined per the NANC IIS, is suitable to support this strategy, certain work-arounds must be implemented in the LSMS. To implement range/block records in the SCP currently requires the

supporting LSMS to detect that a bulk download operation refers to a contiguous range of TNs as specified in the TN list. The LSMS would then forward the download to the SCP as a TN range instead of a TN list as is received from the NPAC/SMS. While the LNP data model in the NPAC/SMS and the SOA/LSMS requires that TN-related semantics are supported, the NPAC interfaces could be enhanced in the future to streamline the process of detecting and initiating range downloads to the SCPs, i.e., by supplementing the TN list with a TN range attribute if the TN list is a contiguous range.

In addition, to identify TNs ported due to pooling activity, a new LNP-type indicator value will be supported. This LNP-type value (POOL) will be used to indicate that the pooling process flows will be utilized in lieu of the existing inter-provider porting flows (LSPP) or intra-provider flows (LISP). Also, this indicator could be used at the LSMS/SCP level to initiate block/range record consolidation for bulk downloads of pooled number blocks. The POOL LNP-type value will also be used to segregate NPAC/SMS activity for reporting purposes and to optionally allow the application of a different cost allocator model for the apportionment of NPAC costs resulting from pooling. It has been suggested that the incremental NPAC costs for porting pooled numbers may not be cost apportioned using the same allocator or apportionment basis as are used for service provider portability.

Finally, changes to NPAC-LSMS interface to support either the pre-porting or port-on-demand methodology are also required. Since this interface has been developed to comply with national (NANC) guidelines, it is questionable whether modifications to accommodate a state-specific implementation would be prudent or acceptable. It is also uncertain whether all service providers' LSMSs could accommodate such interface changes by early or mid 1998.

7.2. End Offices

The impacts of number pooling at the thousands-block level on end office requirements and administration were assessed by the Workshop’s Switch Requirements Subcommittee. The Subcommittee concluded that pooling imposed no additional development on end office switches beyond those required for the implementation of LNP. They also concluded that pooling did not generally impose significant memory or processing capacity demands on those switches.

The requirements for administration of numbers allocated to the block holder’s switch were also discussed. Treatment of numbers was found to vary, depending upon whether numbers in blocks allocated to LSPs other than the NXX assignee are immediately placed in the NPAC and downloaded to LSP databases (i.e., pre-ported), or transmitted a single number at a time, as they are actually assigned to customers (i.e., port-on-demand).

Under pre-porting, numbers are routed to the block holder's switch as soon as the thousands-block is allocated. The block holder must ensure that LRN-routed calls to numbers within that thousands-block that are not yet assigned are provided vacant-number treatment (as opposed to unallocated number treatment), to prevent an error notification message (i.e., release cause code 26) being returned to the originating or intermediate network. Similarly, if a number within that allocated thousands-block is subsequently ported away from the block holder's switch, the LSP must ensure that the error notification message is returned to the originating or intermediate network on LRN-routed calls. If that number is subsequently returned to the block holder (e.g., disconnect with snap-back to the block holder), the LSP must again provide vacant number treatment. All three scenarios require specific translations activity within the block holder's switch, which would not be required if port-on-demand is employed. Within the Subcommittee, opinions differed as to how burdensome this requirement would be. Additional software enhancements to perform such vacant number treatment in a mechanized manner may be desirable.

7.3. SCPs

The Workshop SCP Requirements Subcommittee studied the NXX-X/LRN proposal from the perspective of record capacity, downloads and potential changes to the Requirements document. Regarding record storage capacity, they expressed serious concern that if each pooled number was to be represented by an individual entry in the data base(s), then the record storage capacity of many provider's networks may quickly be exceeded . If this solution were applied to multiple NPAs within the state, region or nation-wide, the required capacity would eventually exceed tens of millions of records. This would apply to records for both LNP records and Global Title Translations (GTTs).

To alleviate this concern, the Subcommittee has suggested that enhancements be developed, so that pooled numbers could be populated within the appropriate data bases in ranges, rather than individual numbers. This would most easily be accomplished if the NPAC download was also transmitted in ranges, which included a unique identifier for those that contained "pooled" numbers. Other methods of aggregating the data were discussed, but most required additional (and perhaps costly) functionality in each service provider's LSMS.

The group also discussed alternate methodologies for representing those pooled ranges within the data base(s). The first followed a structure similar to that employed for individual number records - i.e., one table containing sequential entries, with some entries covering a range of numbers. It was noted that a capability to disaggregate and reaggregate those ranges would be required as the pooling and porting characteristics changed within a given NXX.

The second method was to establish a two-table, two-step approach. A look-up would first be performed within the individual (ported) number table. If no entry was found within, a search of a (pooled) range table would then be performed. It is believed that this approach would avoid the need for continuous disaggregation and reaggregation as numbers changed.

Storing pooled numbers in ranges will require enhancements to the data bases and their interfaces. Proposed changes to the common NPAC interface must be approved and accommodated by each interconnecting service provider within its network. Changes within the data bases themselves may take additional time. Until all such changes are completed, record storage capacity will remain a critical issue, especially if pre-porting is employed to implement number pooling at the thousands-block level. Furthermore, accurate forecasts of the amount of pooled thousands-blocks required by each LSP is needed to properly size data base capacities. Increasing such capacities may require the deployment of additional hardware and software, which reinforces the need to have accurate and timely forecasts with sufficient lead time to implement such changes.

Increased volumes of record transactions due to pooling was also identified as a concern. If such transactions are transmitted via individual number records, delays and congestion may occur during busy periods. The Subcommittee felt that such records should either be transmitted in ranges, off-hours, or somehow afforded a lower priority in transmission scheduling. It was suggested that pre-porting might help alleviate this concern, because large blocks of numbers could be downloaded off-hours.

In summary, the SCP Subcommittee identified the need to: 1) separately identify pooled versus Service Provider Number Portability (SPNP)-ported numbers; 2) load the associated data base records in ranges rather than individual numbers; 3) download such information in non-busy hour periods; and 4) maintain accurate forecasts of demand as critical path items to the deployment of number pooling. It was acknowledged that all of these needs cannot be met by January, 1998 and as such, there is serious concern whether pooling should proceed as planned, beginning on 1/1/98..

7.4. 911 Systems

The impact of number pooling at the thousands-block level was assessed by the 911 Subcommittee of the Workshop. They identified no substantial impacts beyond those already planned to implement LNP as defined in the National Emergency Number Association (NENA). They instead focused on the desire to identify the thousands-block assignee within the MS and Selective Router/Address Location Identifier (SR/ALI) data bases, to ensure prompt resolution of trouble reports suspected to be caused by incomplete or inaccurate routing information.

Subcommittee members felt that this capability was not an absolute necessity and could be added at a later time.

8. Operational Impacts

The Number Pooling Subcommittee also requested several Illinois Number Portability Workshop subcommittees to assess the impact of number pooling on the operating systems and processes that were established or modified to support number portability. The following is a summary of those assessments.

8.1. Rating and Billing

The Workshop Rating and Billing Subcommittee reviewed the potential impact of the NXX-X/LRN proposal on the rating and billing of ported calls. Both pre-porting and port-on-demand were considered. In addition to the assumptions outlined in Section 5.0, the following were added:

- Geographic boundaries of rate center/district are iron-clad, no exceptions.
- Generation of the Automated Message Accounting (AMA) LNP modules by the switch does not deviate from the long-term LNP architecture.

The concerns identified were the same as those of implementing LNP in general. Service providers performing recording/billing services for other service providers may, under certain call scenarios, require modifications to their back-office systems and/or interconnection agreements to support the appropriate passage of billing messages. The NXX-X/LRN pooling solution may exacerbate this concern. The impact of these concerns are not known or quantifiable at this time.

The Subcommittee members have determined that the NXX-X/LRN number pooling proposal should have no new technical impacts on deploying LNP in Illinois. In addition, there do not appear to be any additional rating or billing costs to implement number pooling, except for back-office system modifications as discussed above.

8.2. Alternate Billing

Bell Communications Research (Bellcore) was asked to perform a cursory analysis of the potential impacts of number pooling on the LIDBs (Line Information DataBases), which are used to perform various alternate billing services, such as credit card and bill-to-third-number authorization. The results of that analysis follows.

The LIDB currently contains data stored at the NPA-NNX level (i.e., on a 6-digit basis) that is used in processing Alternate Billing Service (ABS) calls, including both Calling Card service and Billed Number Screening (BNS) services. The administrative support systems (AS/LIDB) that administer and update the LIDB data also store and update data based on NPA-NXX. This data includes, but is not limited to, information such as processing indicators that describe processing capabilities of the entire 10,000 number range, a mapped NPA-NXX table, and data such as Revenue Accounting Office (RAO) and account owner that are provided as default values for the entire NPA-NXX. Although LNP will require that LIDB be able to maintain data for individual line numbers, there are no plans to eliminate the NPA-NXX level information. Changes may be needed to both LIDB and the various administrative supports systems to allow for data to be stored at a 7-digit level (i.e., NPA-NXX-X) rather than at the current NPA-NXX. These changes are not anticipated to adversely impact the implementation of number pooling.

LIDB validation of unassigned numbers may become an issue if the port-on-demand methodology is employed for number pooling. Since validation attempts on unassigned numbers will be default-routed to the code holder's LIDB (or LIDB services provider), rather than the block holder's, a concern has been expressed regarding liability for uncollectable billing.

8.3. Operator Assistance/Directory Assistance

Bellcore was also asked to perform a cursory analysis of the impacts of number pooling on Operator Services (OS) and Directory Assistance (DA). The results of this analysis follows.

Since the NXX-X/LRN makes use of the Operator Services System (OS) LNP implementation, the additional impacts on the OS to support number pooling for operator assistance and directory assistance are expected to be minimal. Because of the use of the LRN, the OS core system (i.e., the system which routes the calls), in particular, need not be upgraded to support 7 digit rating or routing. Instead, similar to LNP, the rating is expected to be based on the NPA-NXX of the dialed digits and the routing is expected to be based on the NPA-NXX of the LRN.

It is possible, however, that external databases used for operator assistance and directory assistance, such as the listing services databases, may require NPA-NXX-X processing rather than NPA-NXX processing. For example, it may be appropriate to define default localities based on 7 digits rather than 6 digits. Further study is needed to identify all the specific aspects of the external databases that would likely be impacted.

8.4. Process Flows

The Workshop's Operations Subcommittee focused on four different provisioning scenarios in assessing the impacts of number pooling on current operational flows and processes. The four scenarios reviewed were:

- Port-On-Demand with snap-back to the code holder
- Port-On-Demand with snap-back to the block holder
- Pre-port with snap-back to the code holder
- Pre-port with snap-back to the block holder

Two subsets to these scenarios were also discussed:

- Pre-port with no snap-back (number remains with most recent LSP)
- Port-on-demand with snap-back to the code holder, but block holder retains the right to re-assign the number

In discussing the above-noted scenarios, several issues were identified that would require resolution, depending upon which one was selected. Those issues included:

- The application of Cause Code 26 for misdirected calls (discussed in Section 7.2)
- Potential changes to the LERG to support assignment at the thousands-block level (further discussed in Section 8.5)
- The need to open the entire range of numbers within the NXX-resident switch to support default routing
- Modifications to existing process flows

The Subcommittee acknowledged a limit to the number of process changes that could be accommodated by the targeted start date of number pooling (1/1/98). This limitation is necessitated by intervals required to fully define and execute changes to the NPAC software and interfaces, as well as to each service provider's interfaces and data bases.

The minimum set of process flows required to support pre-porting[3] include the following:

- Pooling Administrator responds to a request for additional numbers by allocating one or more thousands-blocks
- Pooling Administrator notifies the NPAC and the code holder that a thousands-block has been allocated to another LSP.

[3] Assumes the allocation is to an LSP that is not the code holder.

- Block holder issues a portability request to the NPAC, with appropriate LRN, point code and other information for the allocated thousands-block.
- NPAC initiates an update process of its database and downstream LSMSs on an individual TN basis.
- Code holder translates numbers within the affected thousands-block as "unallocated".
- Block holder translates numbers within affected thousands-block as "unassigned".

The minimum set of process flows required to support port-on-demand[4] include the following:

- Pooling Administrator responds to a request for additional numbers by allocating one or more thousands-blocks
- Pooling Administrator notifies the NPAC and the code holder that a thousands-block has been allocated to another LSP.
- Block holder issues a portability request to the NPAC, with appropriate LRN, point code and other information, on an as-needed basis, for numbers within the allocated thousands-block.
- NPAC initiates an update process of its database and downstream LSMSs on an individual TN basis.
- Code holder retains responsibility for unassigned number treatment for the allocated block
- Block holder returns error message for calls to any unassigned number within the allocated range.

For snap-back to the block holder under a pre-porting environment[5], the process flow must also include a method for notifying the NPAC that a disconnect is pending for a number currently served by an LSP that is not the block holder. The NPAC must maintain a list of who the block holders are, so that upon disconnect (after aging), notification is forwarded to the proper block holder, and the block holder's LRN is populated in the necessary databases. It was acknowledged that a separate identifier (discussed in Section 7.1) is needed to track those numbers that are ported for pooling purposes (versus for SPNP) to ensure snap-back to the proper LSP. Snap-back to the code holder may not require this separate identification.

In summary, consensus on the manner in which number pooling will be implemented within Illinois is needed to identify and execute the required changes to current operational flows and processes. Parties agreed that pre-porting with snap-back to the block holder is a workable solution, if the SCP capacity concerns could be addressed. As of this writing it is uncertain whether a resolution will be available

[4] Also assumes the allocation is to an LSP that is not the code holder.
[5] It is unclear that snap-back to the block holder is feasible if port-on-demand is pursued.

in sufficient time to implement number pooling in order to extend the life of the 847 NPA.

8.5. Provisioning and Support Systems

Individual LSPs participating in number pooling need to identify and assess the actual impact of the NXX-X/LRN proposal on their provisioning and support systems. LEC systems potentially affected include those used for numbering resource management, number assignment, service order provisioning, switch attributes/features management, and translations activity management. Modifications already underway to support LNP may require further augmentation to uniquely identify "pooled" numbers (e.g., for snap-back, tracking and accounting), to block out re-allocated thousands-blocks, and to import partial NXXs. Several LSPs expressed concerns with assigning numbers from allocated thousands-blocks, if the port-on-demand methodology is employed. The need to separately identify and import any number assigned from an allocated thousands-block is considered by a number of LSPs to be extremely burdensome, and a detriment to moving forward with number pooling, if this methodology is chosen.

In addition, changes to the Bellcore Local Exchange Routing Guide (LERG), to reflect ownership at the thousands-block level, is considered by many LSPs to be essential or highly desirable. New requirements for the LERG are being considered by the National Rating and Routing Industry Committee (NRRIC) for submission by September, in order to meet a first or second quarter '98 deployment window.

8.6. Limited Liability Corporation

The Limited Liability Corporation (LLC) members reviewed the current contract with the NPAC provider. They were concerned with the cost of any modifications to the NPAC operations or interfaces needed to support number pooling, when they would be needed, and who would pay them. All changes to the NPAC must be agreed upon by the LLC membership. It is generally acknowledged that few, if any, changes could be accommodated by the NPAC system prior to Release 2.0, which is currently scheduled for installation on February 21, 1998. The process flows recommended by the Operations and NPAC/SMS Subcommittees will require some changes to this software. The costs received from the vendor were not considered to be a major impediment to moving forward with implementation of number pooling.

Allocation of the costs for number pooling will be addressed in a separate section of this report. LLC membership identified a need to separately track such costs, so that alternative allocation and recovery methods could be explored.

9. Number Administration

In today's environment, the dominant LEC, Ameritech, provides the NXX code administration for the entire state. In a new pooled environment, careful administration and assignment of pooled numbers are absolutely essential to ensure maximum utilization of the resource. Within Illinois, several carriers have expressed their opposition to allowing the current Code Administrator to perform this function. Therefore, in a pooled environment, an interim thousands-block administrator may need to be identified to serve in this capacity until NANC can provide a recommendation. The Number Pooling Subcommittee has identified the following high-level responsibilities which the interim pooling administrator must assume:

- Monitoring the pool of available blocks to be shared among LSPs
- Processing requests for new/additional blocks of numbers
- Allocating blocks to requesting LSPs, using established guidelines
- Notifying the Industry of new block assignments
- Coordinating the management of pooled blocks with the Code Administrator and the NPAC
- Preparing and publishing industry reports (e.g., utilization, forecasts, etc.,)

The Number Pooling Subcommittee will work towards the establishment of such guidelines, using the Industry Numbering Committee Code Assignment Guidelines as a source document.

In addition, there is a short-term need to monitor the status of those thousands-blocks within assigned NXXs that are considered pooling candidates. Also, there is a need to ensure restricted assignment within any new NXXs allocated between now and the actual start of number pooling. It is recommended that a monitoring mechanism be put in place to accommodate these needs.

10. Cost Allocation and Recovery

Allocation and recovery mechanisms need to be established for costs associated with this form of number pooling. Such costs may include shared costs, such as NPAC modifications, record processing, and number administration, as well as other service provider-specific costs, such as OSS modifications. A fundamental question that has been raised regarding shared costs is whether they should be allocated among only those LSPs participating in the deployment of number portability, or borne by all LSPs using numbering resources from the 847 NPA. Given the current lack of consensus on a methodology for allocating LNP costs, it is doubtful that LSPs in Illinois will agree on an equitable and fair means of distributing pooling costs. Therefore, for number pooling cost allocation and recovery, the Illinois Commerce Commission must provide direction.

11. Conclusions and Recommendation

Number pooling at the thousands-block level appears to be technically feasible as a means to extend the exhaust date of an NPA. The analysis of the forecast suggests that if implemented beginning 1/1/98, number pooling could extend the exhaust date of the 847 NPA to somewhere between January and May, 1999 (this extended 6 to 12 months beyond the original exhaust date of 2Q98). However, there are several technical and implementation timing issues that simply must be resolved before this measure can be implemented here in Illinois or elsewhere. Current record storage capacity limitations cause concern with using the pre-porting method to implement number pooling at the thousands-block level. Until enhancements can be made available to allow large ranges of numbers to be stored in LNP data bases as a single record entries, SCP overload will remain a very serious concern. As an alternative, a national limit to the number of NPAs to which pooling may be applied, short term, may suffice. Both of these alternatives are being explored. The port-on-demand methodology is believed to initially reduce this concern, but would require additional administration in LSP provisioning systems. However, as assignment increases in the port-on demand scenario, SCP capacity issues will resurface. Several LSPs have indicated that the OSS modifications needed to support this additional administration are significant and simply cannot be completed in time to relieve the 847 NPA. Service providers that support pre-porting as the long term solution question the practicality of pursuing such changes.

Therefore, the Subcommittee recommends that the actual implementation of number pooling in Illinois be deferred until resolutions to the above-mentioned concerns, especially the capacity concern, are identified and available. The Subcommittee believes that number pooling can and will be implemented in Illinois sometime in 1998. Although the analysis of the forecast suggests that number pooling will not extend the exhaust date of the 847 area code beyond 2Q99, the Subcommittee will continue its efforts towards implementing number pooling in the 847 area code. Specific work efforts will include defining responsibilities for, and identifying an interim Pooling Administrator, defining NPAC requirements, addressing the capacity issue, developing a new set of administrative guidelines, and defining methods and procedures for activating pooled numbers.

Illinois Number Pooling Trial within NPA 847
Interim Report
August 21, 1998

Members of the Number Pooling Subcommittee of the Illinois Number Portability Workshop offer this interim report on progress made to date in conducting a trial of thousands-block number pooling within the 847 Number Planning Area. On May 11, 1998 the Illinois Commerce Commission entered an order in Dockets 97-0192 and 97-0211 which set out conservation methods designed to delay or avoid the need for relief in NPA 847 and additional Chicago metropolitan NPA's. Part of the Order directed the Illinois LNP Task Force to take all measures necessary to develop, implement and trial number pooling within NPA 847 as soon as was technically feasible. The trial, which began on June 1, 1998 and will conclude on December 31, 1998, uses the existing number portability (LNP) architecture and preport methodology for reallocating thousands blocks to other ~~carriers~~Service Providers (SP's). It will follow the 847 Trial Work Plan developed by the Number Pooling Subcommittee and documented on the www.numberpool.com web site. Part of the Trial Work Plan includes the publication of two interim reports and one final ~~report which~~report, which documents the results of the trial. The reports will follow the outline detailed within the Pooling Expectations Document, which was developed by the Subcommittee on February 4, 1998.

Since the trial has been underway for only a short period of time, this first report, by necessity, is limited in content, conclusions and actual data. Several reporting categories have been purposely excluded due to a lack of information at this time. Instead this report contains anecdotal information and many "first impressions". Subsequent reports are expected to include much more empirical data and provide a better picture of the extent to which thousands-block number pooling may be an effective number conservation measure.

1. Pooling Administrator Capabilities and Efficiencies

Overall, participating carriers have reported positive results in their interaction with Lockheed-Martin, as the Pooling Administrator (PA). The PA has been found to be very knowledgeable and helpful in answering questions on pooling and number portability matters, and responded in a timely manner to requests for allocations, both during the process test phase and since trial turn-up. The PA web site has been found to be user-friendly and an efficient means of accessing information. One carrier has reported problems with obtaining allocations in situations where no forecast for additional numbering resources had been previously submitted. They noted that the Pooling Administration Guidelines does ~~s~~ accommodate the need for additional blocks to meet a bona fide customer request, and suggested that the request forms be modified to include this category, and that the PA be prepared to grant requests for allocations under such conditions.

2. Service Provider Support Systems

Under this heading, carriers were provided an opportunity to report on the extent and adequacy of modifications made to the~~ir~~ ordering, provisioning, and support systems needed to support the number pooling trial. Only two ~~carriers~~ SP's offered comment regarding this issue. One reported that ~~they~~ it had completed the requisite changes to ~~their~~ its systems to support the pooling effort. Another reported that significant time and cost was incurred in modifying one system to allow for the donation of contaminated blocks (i.e., blocks with 100 or ~~less~~ fewer working numbers) to the pool.

3. Assignment Guidelines Efficiencies and Thoroughness

Carriers were asked to share their perspective on the adequacy of the Number Pooling Administration Guidelines that were specifically developed in Illinois for the Trial. Those carriers that responded indicated that overall, the Guidelines have served their intended purpose, but that some situations have occurred that warrant consideration of some revisions. For example, the situation ~~in which~~where NXX's have been returned to the Code Administrator after blocks within those NXX's have been donated to the Pool, needs to be addressed. In addition, it has been noted that the Number Pooling Administration Guidelines criteria under which the PA may request NXX's ~~-~~from the Code Administrator (to replenish shortfalls within certain rate centers) are inconsistent with those contained within the Central Office Code (NXX) Administration Guidelines. Also, the NPAC (Number Portability Administration Center) has requested that certain SS7 routing information (i.e., subsystem number and destination point codes) be included on the request forms. Finally, one carrier has suggested that the required interval for porting working numbers within contaminated blocks eligible for donation to the Pool should be extended.

A related problem that has surfaced ~~is one in which~~concerns calls to numbers within allocated blocks that may not complete in all networks~~,~~. ~~due to~~This happens when LNP triggers are not ~~being~~ set for the associated NXX, or the NXX is not ~~being~~ opened for general call routing. One carrier reported this situation, and upon investigation~~,~~ found ~~the cause to be~~ that not all LNP-capable carriers had activated an LNP trigger for the associated NXX. Additionally, since the donated block was from a relatively new NXX, some carriers had not activated
the NXX code and were still routing all calls to vacant code announcement. These issues may be more operational in nature. ~~and best~~They may be most effectively resolved within the Operations Subcommittee of the Illinois Number Portability Workshop.

4. Utility of Pooling as a Number Conservation Method

This item is intended to provide factual data on the current inventory and use of the Pool's numbering resources. Because the Trial is still in its infancy, no conclusions can be drawn at this point. The categories listed below are those believed to be relevant to completing an assessment, when appropriate.

Number of ~~wireline~~ Wireline carriers that have donated blocks to the Pool:	11
Number of ~~wireline~~ Wireline carriers that have submitted forecasts for blocks:	16
Number of "clean" blocks donated to the Pool (as of ~~-~~ 8/11/98):	375
Number of "contaminated" blocks donated to the Pool (as of 8/10/98):	59
Number of blocks eligible for donation (per ICC Staff):	1151
Number of blocks forecasted ~~thru~~ through 4Q98 (per Lockheed-Martin, as of 8/11/98):	649
Number of blocks allocated (as of 8/11/98):	12
Number of NXXs "saved" (estimated):	4
Number of NXXs within which blocks have been donated to the Pool (as of 8/11/98):	132
Total NXX's assigned within NPA 847:	657
Total ~~wireline~~ Wireline NXX's assigned within NPA 847:	492

Colorado Number Pooling Model Results

In approximately December 1997, the Colorado Public Utilities Commission staff obtained number utilization data from all central office code holders in the 303 NPA. Under the direction of the Colorado Numbering Task Force, this data was to be used to evaluate the effects of number pooling. The data was obtained from the code holders under the Commission's statutory audit and subpoena authorities and upon a guarantee of maintaining the confidentiality of individual carrier data. The Commission staff assembled the number utilization data by thousand block into a model that was capable of examining the forecasted exhaust dates and utilization rates under various pooling scenarios. During the period of data gathering, the 303 NPA was in a jeopardy situation and was forecasted to exhaust approximately in June 1998. Therefore, under existing ten thousand block (NXX) allocation of numbering resources, the 303 NPA was essentially exhausted. The model was prepared in expectation of number pooling and expected to estimate the effect on the exhaust date under both thousand block and individual telephone number pooling. Following are descriptions of the assumptions in the model and the results of the model.

Assumptions

1. Thousand block utilization data was obtained from all code holders in the 303 NPA for approximately the same time period.
2. Number pooling would only be available in LNP-capable rate areas and in LNP-capable carriers.
3. All existing thousand blocks that have less than 10% contamination would be available for pooling.
4. To estimate a comparison between existing NXX allocation, thousand block pooling and individual telephone number pooling a static model was used. That is, all factors were held constant and the evaluation was made using current data without forecasts.

Results

1. Numbers currently assigned or otherwise not available for assignment - 4,875,889.
2. NXX codes currently assigned and working - 683
3. Theoretical maximum number of NXX codes assignable -792[1]
4. NXX codes necessary under a thousand block pooling arrangement - 574
5. NXX codes necessary under an individual telephone number pooling arrangement - 508
6. Theoretical percent of resource reclaimed by thousand block pooling (line 4 relative to line 2) - 16%
7. Actual percent of resource reclaimed by thousand block pooling (line 4 relative to 740 codes) - 23%

[1] The theoretical maximum cannot be reached in Colorado because of protected codes and other code administrator reasons. Because this theoretical maximum cannot be reached in the 303 NPA, the real adjusted maximum is closer to 740 codes.

8. Theoretical percent of resource reclaimed by ITN pooling (line 5 relative to line 2) - 26%
9. Actual percent of resource reclaimed by ITN pooling (line 5 relative to 740 codes) - 31%

Conclusion

Based upon the use of more realistic adjusted maximum data (lines 7 and 9), Colorado theoretically could have reclaimed approximately 23% of the NPA resource through thousand block pooling and an additional 8% from ITN pooling (for a total of 31% reclamation through ITN). From data gathered in a single nearly exhausted NPA in Colorado, it is apparent that thousand block pooling provides the largest impact on resource reclamation of pooling.

APPENDIX E: ATF Report to NRO

New York Interim Thousand Block Number Pooling

Thousand block number pooling began in New York on July 1, 1998. The pool is the result of a joint industry/Commission Staff Task Force and subsequent steering committee that was formed at the New York Commission's request in October 1997. Phase I thousand block number pooling currently is limited to the 212 NPA (Manhattan), which is scheduled to have an overlay code (646) added in the coming months. (Phase I processes may be used in other NPAs under similar conditions.) Thousand blocks that are donated consist only of non-contaminated blocks. (The scope of the New York pooling effort is detailed in the Assignment Guidelines document, dated June 29, 1998.) Lockheed Martin was selected by the Northeast Carrier Acquisition Company, LLC to be the interim pooling administrator. The industry pool established under Phase I is expected to be administered by the interim pooling administrator for a period of 12 to 18 months.

Currently, 34 thousand-number blocks have been contributed to the pool. Donations were made after individual discussions between the service providers and Commission Staff, which attempted to seek maximum participation by all carriers with 212 number assignments. Additional block donations are expected. To date, no carrier has requested to withdraw a block from the pool.

ITN Number Pooling

LOCKHEED MARTIN

ITN with NPAC and 3rd Party Network Element

Barry Bishop
Director of Numbering Services
Lockheed Martin

ITN Pooling using 3rd party Network Element

LOCKHEED MARTIN

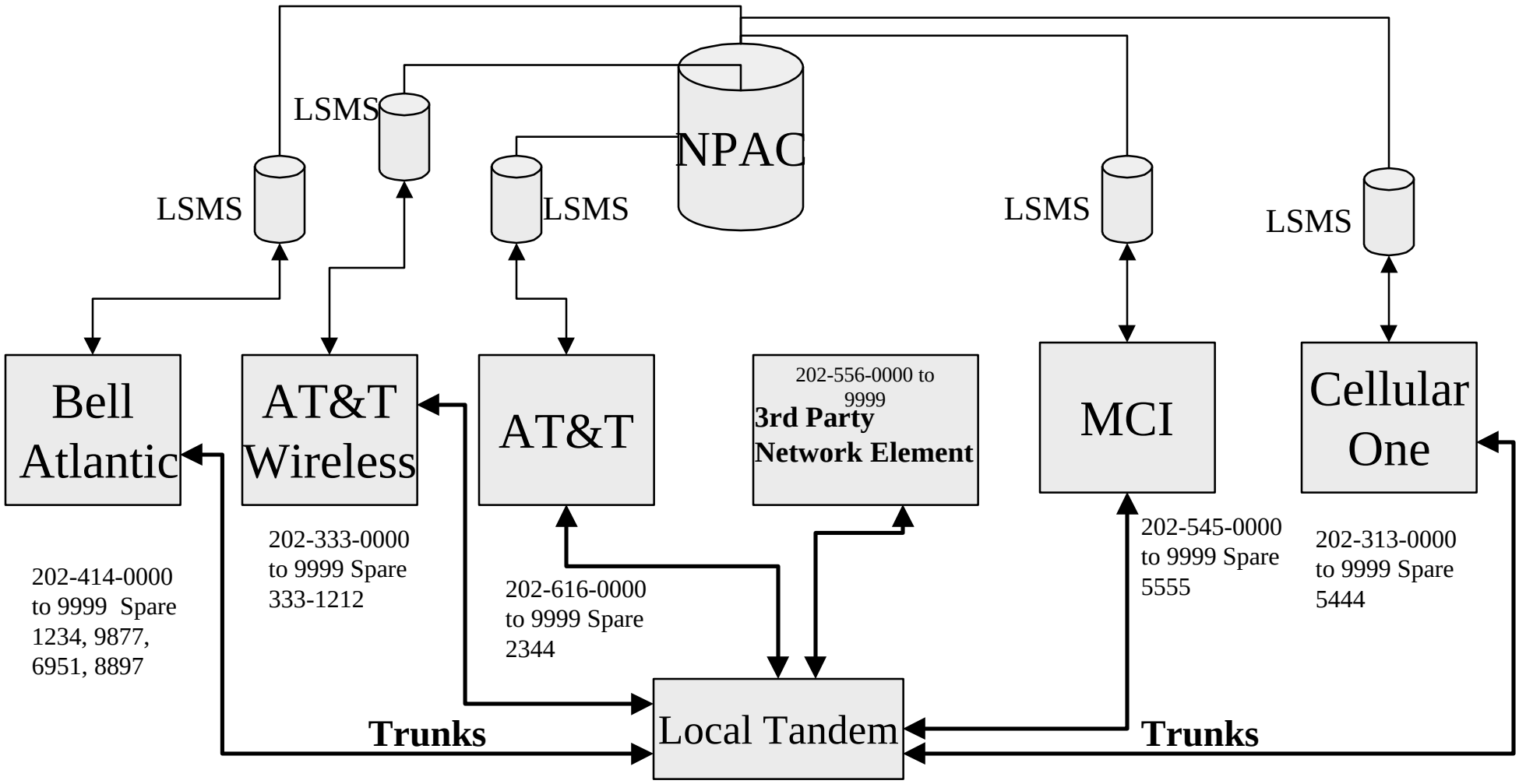
- ITN Pooling may be accomplished by porting all unused numbers to an independent 3rd party Network Element.
  - Third party provides a network element (NE)
  - This NE will have a distinct LRN assigned to it.
  - NE will provide vacant code treatment for calls which may ultimately route to it.
  - NXX's will continue to be assigned to Service providers as they are today, but all 10,000 numbers will then be ported to the NE using existing LNP/NPAC capabilities.
  - Existing unused Service Provider numbers can also be ported to the NE.
  - Existing Service Provider numbers upon disconnect (and after intercept treatment has been completed) will snap back to the NE.
  - Lerg updates are completed the same as today for default routing.
    - If a call is default routed to the SP assigned the NXX, it will query and route to the ITN NE.

ITN Pooling using 3rd Party Network Element (continued)

LOCKHEED MARTIN

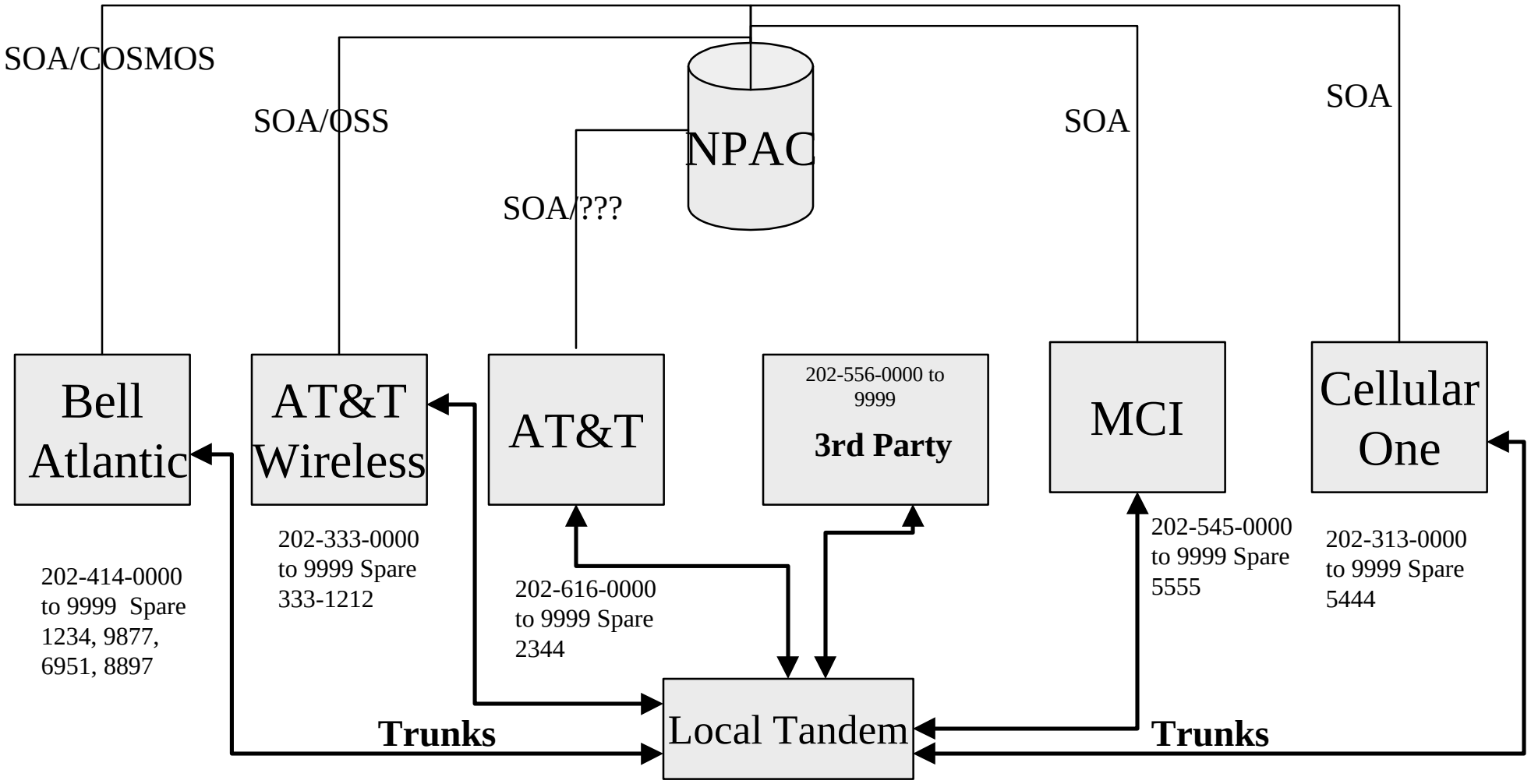
- Service Providers can obtain any spare number by querying NPAC for any number which is assigned LRN of the pooling administrator (note, this also solves issue of porting vacant numbers as they can be placed in the pool)
- May minimize changes to service provider OSS's
- Under this scenario Snap Back will be to the 3rd Party NE
  - This may require a change to NPAC software (pooled number bit or additional table) to support numbers subsequently ported to another provider after the initial assignment.
  - Can be easily transitioned from thousand block pooling. Existing NPAC software may be fully reusable.
- **Does not** cause any additional problems for **911**. Changes made initially for LNP should be sufficient.
- Non-LNP default routing not affected
- Should minimize or eliminate the cause code 26 issue
- Minimizes changes to existing Network Configurations (NANPA assigns CO codes, NPAC ports numbers, Service Providers route calls as normal)

Proposed ITN Pooling Network



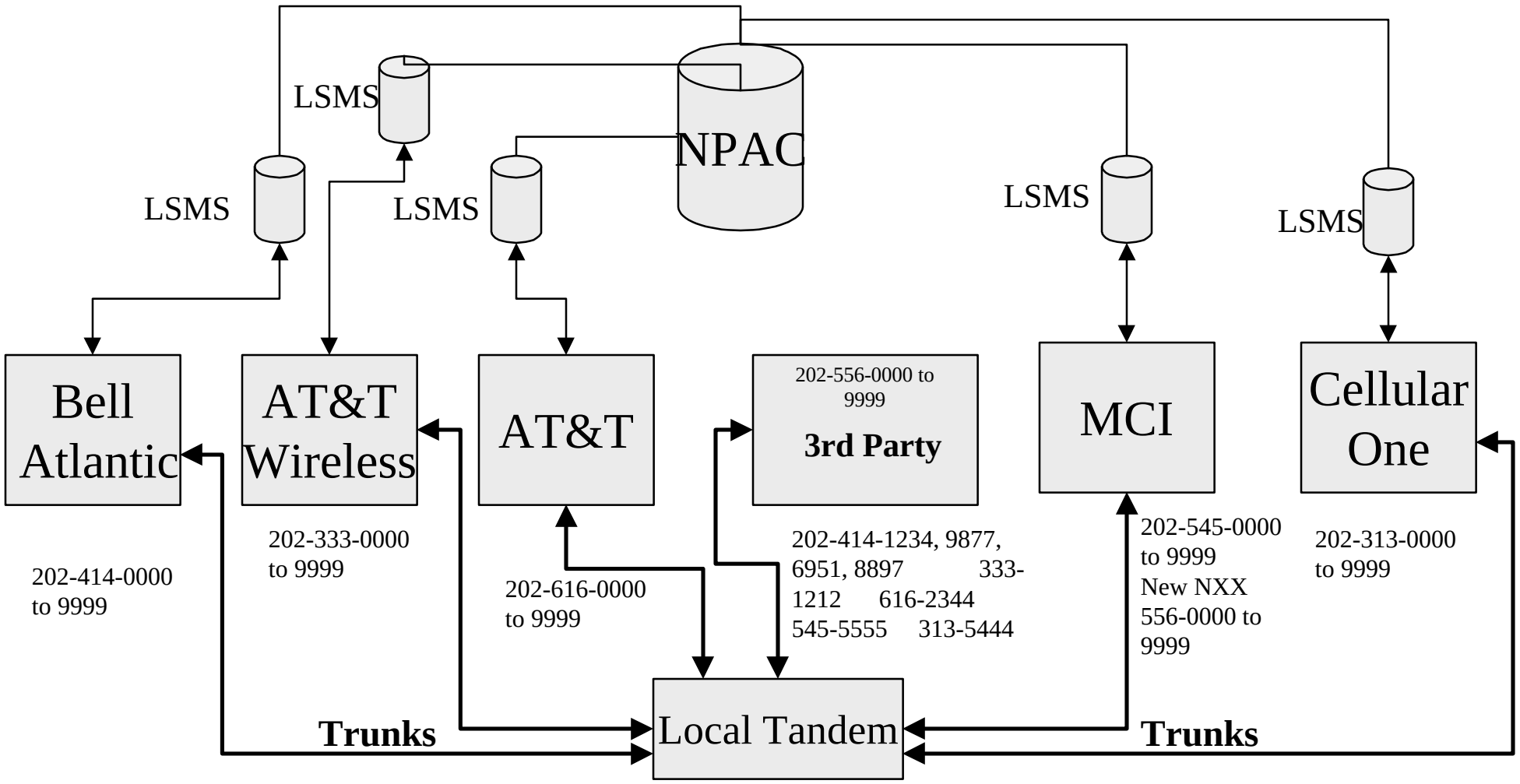
Querying NPAC for available # via SOA or Separate Link

LOCKHEED MARTIN

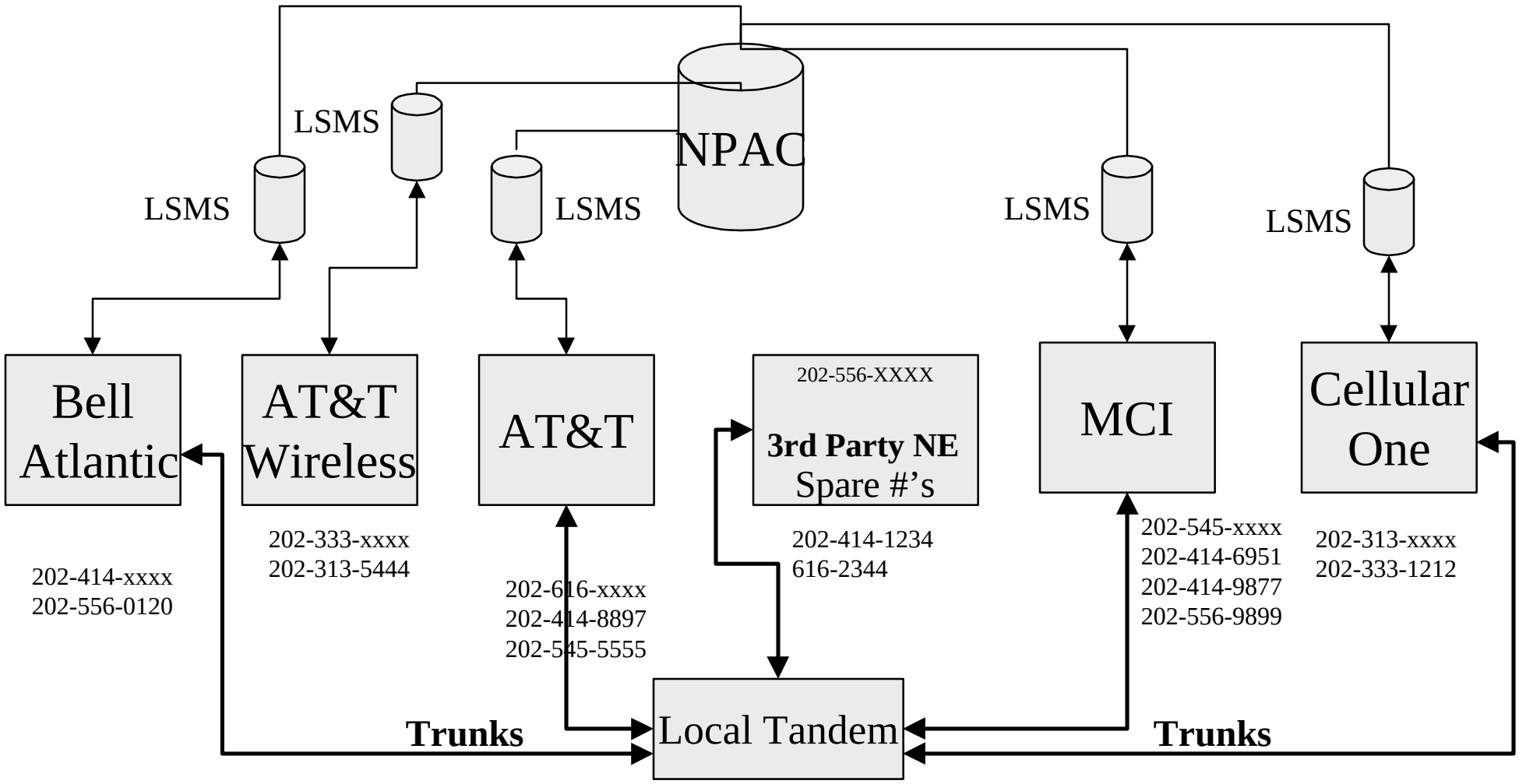


Spare #'s and new NXX "Ported" to 3rd Party Network Element

LOCKHEED MARTIN



Spare and new NXX #'s Ported from 3rd party NE to SP's as needed



Service Provider Questionnaire - Thousand Block Pooling

Total Responses Received: 6 (1 respondent did not provide any specific responses to questions)

Subscribers:	A <1K	B 1K-10K	C 10K-50K	D 50K-100K	E 100K-500K	F >500K
Responses:			I	I		III

Question	A <$10K	B $10K-100K	C $100K-$1M	D $1M-$5M	E $5M - $20M	F # >$20M
Tariffs, Pricing Changes & Contracts	I	I	I (Note 6)			
Customer Education	I, I	I	I			
Customer Care & Billing Systems			I, I	I		I, I (Note 4 & 8)
Service Activation Systems				I, I (Note 2), I		I (Note 7)
Service Maintenance Systems		I	I, I			I (Note 7)
Switching Systems		I	I	I		I, I (Note 4)
SS7 Signaling		I		I (Note 3), I		I
Employee Training	I	I, I		I	I (Note 4 & 9)	

(Note 1)

Although costs were requested in a per-MSA basis, it cannot be determined whether all of these costs would be duplicated if this optimization measure is applied to multiple MSAs.

Service Provider Questionnaire - Thousand Block Pooling

Time to Implement Ranges	0-6 Months	6-12 Months	12-18 Months I,I,I (Note 6), I (Note 4)	18-24 Months	2-4 years	>4 years
Time to Implement						
			12-14 months after regulatory approval			
			12-15 months			
			1 year			
			18 months			
	Undetermined until industry requirements are finalized					

$20-million is a lower limit to this cost range. The ATF has no additional information as to what the upper limit of SPs' estimates might be with the exception of the one response.

Thousand Block Pooling NOTES:

1. Regulatory decisions on cost allocation and recovery may impact tariffs and pricing
2. Includes allocated costs of shared administrative systems (e.g., NPAC transactions, industry pool and administrator, etc.)
3. Includes costs of SCP enhancements
4. Total Network Costs - F; Total Service Provider System Costs - F; Total Employee Expense - E
   Does not reflect PA costs; 12-14 months after regulatory mandate.
5. The time estimates provided in this report are dependent on vendor completion of required activities to support the specific number conservation option being described.
   Estimates to complete work assumes all vendors modifications are fully deployed and tested.
   Once the vendor schedules are available, a review of the SP interval would be appropriate to put the overall time estimates into a more specific time context.
6. Indicates costs for this category could be within categories A-C in the correspondingly marked total.
7. These costs have been included in combination with the response in Customer Care & Billing Systems.
8. Includes all SP OSS costs.
9. Includes all SP Employee costs.

Although costs were requested in a per-MSA basis, it cannot be determined whether all of these costs would be duplicated if this optimization measure is applied to multiple MSAs.

Service Provider Questionnaire - Traditional Rate Center Consolidation

Total Responses Received: 6 (1 respondent did not provide any specific responses to questions) 4 respondents replied

Subscribers:	A <1K	B 1K-10K	C 10K-50K	D 50K-100K	E 100K-500K	F >500K
Responses:			I	I		III

Question	A <$10K	B $10K-100K	C $100K-$1M	D $1M-$5M	E $5M - $20M	F # >$20M
Tariffs, Pricing Changes & Contracts	I, I					I (Note 1), I (Note 5)
Customer Education		I, I		I (Note 2)		I (Note 5)
Customer Care & Billing Systems		I	I		I (Note 3)	I (Note 5)
Service Activation Systems		I	I (Note 4), I			I (Note 5)
Service Maintenance Systems	I	I		I (Note 2)		I (Note 5)
Switching Systems	I	I	I (Note 4)			I (Note 5)
SS7 Signaling	I	I				I (Note 5) (Note 6)
Employee Training	I	I		I (Note 2)		I (Note 5)

Although costs were requested in a per-MSA basis, it cannot be determined whether all of these costs would be duplicated if this optimization measure is applied to multiple MSAs.

Service Provider Questionnaire - Traditional Rate Center Consolidation

Time to Implement Ranges	0-6 Months I	6-12 Months I,I	12-18 Months	18-24 Months	2-4 years I (Note 5)	>4 years
Time to Implement						
	3 to 6 months	8 months			2.5 years	
		4 to 12 months				

$20-million is a lower limit to this cost range. The ATF has no additional information as to what the upper limit of SPs' estimates might be with the exception of the one response.

RCC Notes:

1. Respondent identified costs between A-F
2. Respondent identified costs between A-D
3. Respondent identified costs between A-E
4. Respondent identified costs between A-C
5. The only cost data available for one SP is based upon a study completed for one state.
   This study indiciates that the costs, without considering revenue changes, would be in the F cost range and that the time to implement would be at least 2.5 years after regulatory manadate.
6. One SP did not provide any response to this question.

Although costs were requested in a per-MSA basis, it cannot be determined whether all of these costs would be duplicated if this optimization measure is applied to multiple MSAs.

Modified NRO Report to NANC
Rate Center Consolidation Questionnaire Responses

Service Provider Questionnaire - Existing Rate Center Consolidation

Total Responses Received: 6 (1 respondent did not provide any specific responses to questions) 4 respondents replied

Subscribers:	A <1K	B 1K-10K	C 10K-50K	D 50K-100K	E 100K-500K	F >500K
Responses:			I	I		III

Question	A <$10K	B $10K-100K	C $100K-$1M	D $1M-$5M	E $5M - $20M	F # >$20M
Tariffs, Pricing Changes & Contracts	I, I					I (Note 1), I (Note 5)
Customer Education		I, I		I (Note 2)		I (Note 5)
Customer Care & Billing Systems		I	I		I (Note 3)	I (Note 5)
Service Activation Systems		I	I (Note 4), I			I (Note 5)
Service Maintenance Systems	I	I		I (Note 2)		I (Note 5)
Switching Systems	I	I	I (Note 4)			I (Note 5)
SS7 Signaling	I	I				I (Note 5) (Note 6)
Employee Training	I	I		I (Note 2)		I (Note 5)

Modified NRO Report to NANC
Rate Center Consolidation Questionnaire Responses

Service Provider Questionnaire - Existing Rate Center Consolidation

Time to Implement Ranges	0-6 Months I	6-12 Months I,I	12-18 Months	18-24 Months	2-4 years I (Note 5)	>4 years
Time to Implement						
	3 to 6 months	8 months			2.5 years	
		4 to 12 months				

$20-million is a lower limit to this cost range. The ATF has no additional information as to what the upper limit of SPs' estimates might be with the exception of the one response.

RCC Notes:
1. Respondent identified costs between A-F
2. Respondent identified costs between A-D
3. Respondent identified costs between A-E
4. Respondent identified costs between A-C
5. The only cost data available for one SP is based upon a study completed for one state.
   This study indiciates that the costs, without considering revenue changes, would be in the F cost range and that the time to implement would be at least 2.5 years after regulatory manadate.
6. One SP did not provide any response to this question.

Service Provider Questionnaire - Unassigned Number Pooling

Total Responses Received: 6 (1 respondent did not provide any specific responses to questions)

Subscribers:	A <1K	B 1K-10K	C 10K-50K	D 50K-100K	E 100K-500K	F >500K
Responses:			I	I		III

Question	A <$10K	B $10K-100K	C $100K-$1M	D $1M-$5M	E $5M - $20M	F # >$20M	
Tariffs, Pricing Changes & Contracts	I	I	I (Note 6)				(Note 1), (Note 2)
Customer Education	I, I		I, I				(Note 1)
Customer Care & Billing Systems		I		I		I, I (Note 7)	(Note 1)
Service Activation Systems		I		I		I (Note 3), I	(Note 1)
Service Maintenance Systems		I	I,I			I (Note 7)	(Note 1)
Switching Systems	I	I	I			I	(Note 1)
SS7 Signaling		I		I	I (Note 4)		(Note 1)
Employee Training	I		I, I				(Note 1)

Although costs were requested in a per-MSA basis, it cannot be determined whether all of these costs would be duplicated if this optimization measure is applied to multiple MSAs.

Service Provider Questionnaire - Unassigned Number Pooling

Time to Implement Ranges	0-6 Months	6-12 Months I, I	12-18 Months I	18-24 Months	2-4 years	>4 years
Time to Implement						
		8 months	10 to 15 months			
		6 to 9 months				

I (Note 1), I (Note 5)

$20-million is a lower limit to this cost range. The ATF has no additional information as to what the upper limit of SPs' estimates might be with the exception of the one response.

Unassigned Number Pooling NOTES:

1. Unassigned Number Porting is not sufficiently defined at this time to estimate costs or time frames for implementation. Both the costs and time frame for implementation are dependent upon the application of UNP and the scope of its implementation.
2. Regulatory decisions on cost allocation and recovery may impact tarrifs and pricing.
3. Includes allocated costs of shared administrative systems (e.g. NPAC transactions, industry pool and administrator, etc.)
4. Includes cost of SCP enhancements.
5. Implementation intervals cannot be estimated until industry requirements are identified.
6. SP identified costs between A-C.
7. SP identified costs are included in correspondingly market total.

Although costs were requested in a per-MSA basis, it cannot be determined whether all of these costs would be duplicated if this optimization measure is applied to multiple MSAs.

Service Provider Questionnaire - Reduce Demand for Numbering Resources

Total Responses Received: 6 (1 respondent did not provide any specific responses to questions) 3 respondents provided data

Subscribers:	A <1K	B 1K-10K	C 10K-50K	D 50K-100K	E 100K-500K	F >500K
Responses:			I	I		III

Question	A <$10K	B $10K-100K	C $100K-$1M	D $1M-$5M	E $5M - $20M	F # >$20M	
Tariffs, Pricing Changes & Contracts							I (Note 1), I (Note 1), I (Note 2)
Customer Education							I (Note 1), I (Note 1), I (Note 2)
Customer Care & Billing Systems							I (Note 1), I (Note 1), I (Note 2)
Service Activation Systems							I (Note 1), I (Note 1), I (Note 2)
Service Maintenance Systems							I (Note 1), I (Note 1), I (Note 2)
Switching Systems							I (Note 1), I (Note 1), I (Note 2)
SS7 Signaling							I (Note 1), I (Note 1), I (Note 2)
Employee Training							I (Note 1), I (Note 1), I (Note 2)

Although costs were requested in a per-MSA basis, it cannot be determined whether all of these costs would be duplicated if this optimization measure is applied to multiple MSAs.

Service Provider Questionnaire - Reduce Demand for Numbering Resources

Time to Implement Ranges	0-6 Months	6-12 Months	12-18 Months	18-24 Months	2-4 years	>4 years
Time to Implement						

I (Note 1), I (Note 1), I (Note 2)

$20-million is a lower limit to this cost range. The ATF has no additional information as to what the upper limit of SPs' estimates might be with the exception of the one response.

Overlay NPA NOTES:

1. N/A
2. Per the ATF, information on this alternative is no longer being requested.

Although costs were requested in a per-MSA basis, it cannot be determined whether all of these costs would be duplicated if this optimization measure is applied to multiple MSAs.

Service Provider Questionnaire - 10 Digit Dialing

Total Responses Received: 6 (1 respondent did not provide any specific responses to questions) 3 respondents provided data

Subscribers:	A <1K	B 1K-10K	C 10K-50K	D 50K-100K	E 100K-500K	F >500K
Responses:			I	I		III

Question	A <$10K	B $10K-100K	C $100K-$1M	D $1M-$5M	E $5M - $20M	F # >$20M
Tariffs, Pricing Changes & Contracts	I	I (Note 1)				I (Note 2)
Customer Education		I (Note 1)	I			I (Note 2)
Customer Care & Billing Systems	I	I (Note 1)				I (Note 2)
Service Activation Systems	I	I (Note 1)				I (Note 2)
Service Maintenance Systems		I, I (Note 1)				I (Note 2)
Switching Systems		I	I			I (Note 2)
SS7 Signaling	I	I				I (Note 2)
Employee Training	I	I				I (Note 2)

Although costs were requested in a per-MSA basis, it cannot be determined whether all of these costs would be duplicated if this optimization measure is applied to multiple MSAs.

Service Provider Questionnaire - 10 Digit Dialing

Time to Implement Ranges	0-6 Months I	6-12 Months I	12-18 Months	18-24 Months	2-4 years	>4 years
Time to Implement						
	3 to 6 months	8 months				

(Note 3)

$20-million is a lower limit to this cost range. The ATF has no additional information as to what the upper limit of SPs' estimates might be with the exception of the one response.

10 Digit Dialing NOTES:

1. Assumes no 0xx or 1xx.
2. The costs to implement 10 digit dialing with an overlay are included in the NPA overlay cost estimates.
   This SP has insufficient information to evaluate all the implications and costs of 10 digit dialing (which includes opening the "D" digit - allowing 0/1 as the initial digit of the central office code). However, based on information currently available from vendors, this SP believes the associated costs would be in category F.
3. One SP did not provide any estimated implmentation timeframes.

Although costs were requested in a per-MSA basis, it cannot be determined whether all of these costs would be duplicated if this optimization measure is applied to multiple MSAs.

Service Provider Questionnaire - ELCA

Total Responses Received: 6 (1 respondent did not provide any specific responses to questions) 3 respondents provided data

Subscribers:	A <1K	B 1K-10K	C 10K-50K	D 50K-100K	E 100K-500K	F >500K
Responses:			I	I		III

Question	A <$10K	B $10K-100K	C $100K-$1M	D $1M-$5M	E $5M - $20M	F # >$20M	
Tariffs, Pricing Changes & Contracts		I	I				(Note 1)
Customer Education		I	I				(Note 1)
Customer Care & Billing Systems			I	I			(Note 1)
Service Activation Systems			I	I			(Note 1)
Service Maintenance Systems			I	I			(Note 1)
Switching Systems			I, I				(Note 1)
SS7 Signaling	I	I					(Note 1)
Employee Training		I, I					(Note 1)

Although costs were requested in a per-MSA basis, it cannot be determined whether all of these costs would be duplicated if this optimization measure is applied to multiple MSAs.

Service Provider Questionnaire - ELCA

Time to Implement Ranges	0-6 Months	6-12 Months I	12-18 Months	18-24 Months I	2-4 years	>4 years
Time to Implement						
		6 to 9 months				
				24 months		

$20-million is a lower limit to this cost range. The ATF has no additional information as to what the upper limit of SPs' estimates might be with the exception of the one response.

ELCA NOTES:

1. ELCAs, Inconsistent Rate Centers, and Location Portability are alternatives that this SP has not yet studied or quantified.
   These alternatives are related in that they drive toward a revised approach for rating calls across all service providers.
   Any perturbation of the current approach has network and systems (particularly billing systems) effects that are not yet fully understood by the industry.
   For example, inconsistent rate centers impact the efficiency of 1000s block administration. Likewise, true location portability divorces call rating from the TN which has yet to be studied implications for the industry.
   This SP's view is that the industry would need to begin a process of identifying and narrowing the issues and standards that are involved with
   true location portability before the company would be in a position to comment on the effectiveness or value of the alternatives.

Although costs were requested in a per-MSA basis, it cannot be determined whether all of these costs would be duplicated if this optimization measure is applied to multiple MSAs.

Although costs were requested in a per-MSA basis, it cannot be determined whether all of these costs would be duplicated if this optimization measure is applied to multiple MSAs.

Although costs were requested in a per-MSA basis, it cannot be determined whether all of these costs would be duplicated if this optimization measure is applied to multiple MSAs.

Modified NRO Report to NANC
Rate Center Consolidation Questionnaire Responses

Service Provider Questionnaire - Existing Rate Center Consolidation

Total Responses Received: 6 (1 respondent did not provide any specific responses to questions) 4 respondents replied

Subscribers:	A <1K	B 1K-10K	C 10K-50K	D 50K-100K	E 100K-500K	F >500K
Responses:			I	I		III

Question	A <$10K	B $10K-100K	C $100K-$1M	D $1M-$5M	E $5M - $20M	F # >$20M
Tariffs, Pricing Changes & Contracts	I, I					I (Note 1), I (Note 5)
Customer Education		I, I		I (Note 2)		I (Note 5)
Customer Care & Billing Systems		I	I		I (Note 3)	I (Note 5)
Service Activation Systems		I	I (Note 4), I			I (Note 5)
Service Maintenance Systems	I	I		I (Note 2)		I (Note 5)
Switching Systems	I	I	I (Note 4)			I (Note 5)
SS7 Signaling	I	I				I (Note 5) (Note 6)
Employee Training	I	I		I (Note 2)		I (Note 5)

Modified NRO Report to NANC
Rate Center Consolidation Questionnaire Responses

Service Provider Questionnaire - Existing Rate Center Consolidation

Time to Implement Ranges	0-6 Months I	6-12 Months I,I	12-18 Months	18-24 Months	2-4 years I (Note 5)	>4 years
Time to Implement						
	3 to 6 months	8 months			2.5 years	
		4 to 12 months				

$20-million is a lower limit to this cost range. The ATF has no additional information as to what the upper limit of SPs' estimates might be with the exception of the one response.

RCC Notes:
1. Respondent identified costs between A-F
2. Respondent identified costs between A-D
3. Respondent identified costs between A-E
4. Respondent identified costs between A-C
5. The only cost data available for one SP is based upon a study completed for one state.
   This study indiciates that the costs, without considering revenue changes, would be in the F cost range and that the time to implement would be at least 2.5 years after regulatory manadate.
6. One SP did not provide any response to this question.

Service Provider Questionnaire - Geographic Splits

Total Responses Received: 6 (1 respondent did not provide any specific responses to questions) 3 respondents provided data

Subscribers:	A <1K	B 1K-10K	C 10K-50K	D 50K-100K	E 100K-500K	F >500K
Responses:			I	I		III

Question	A <$10K	B $10K-100K	C $100K-$1M	D $1M-$5M	E $5M - $20M	F # >$20M
Tariffs, Pricing Changes & Contracts	I,I				I (Note 2)	
Customer Education		I,I			I (Note 2)	
Customer Care & Billing Systems	I			I (Note 1)	I (Note 2)	
Service Activation Systems	I		I		I (Note 2)	
Service Maintenance Systems	I		I		I (Note 2)	
Switching Systems		I	I		I (Note 2)	
SS7 Signaling	I	I			I (Note 2)	
Employee Training	I	I			I (Note 2)	

Although costs were requested in a per-MSA basis, it cannot be determined whether all of these costs would be duplicated if this optimization measure is applied to multiple MSAs.

Service Provider Questionnaire - Geographic Splits

Time to Implement Ranges	0-6 Months	6-12 Months I	12-18 Months I, I	18-24 Months	2-4 years	>4 years
Time to Implement						
		12 months	12 to 15 months			
			12 to 18 months			

$20-million is a lower limit to this cost range. The ATF has no additional information as to what the upper limit of SPs' estimates might be with the exception of the one response.

Geographic Splits NOTES:
1. SP identified costs between C and D, Regrogramming Cellular Phones
2. Cost category E: 12 - 18 months

Although costs were requested in a per-MSA basis, it cannot be determined whether all of these costs would be duplicated if this optimization measure is applied to multiple MSAs.

Service Provider Questionnaire - Inconsistent Rate Centers

Total Responses Received: 6 (1 respondent did not provide any specific responses to questions) 3 respondents provided data

Subscribers:	A <1K	B 1K-10K	C 10K-50K	D 50K-100K	E 100K-500K	F >500K
Responses:			I	I		III

Question	A <$10K	B $10K-100K	C $100K-$1M	D $1M-$5M	E $5M - $20M	F # >$20M	
Tariffs, Pricing Changes & Contracts		I	I				(Note 1)
Customer Education		I	I				(Note 1)
Customer Care & Billing Systems			I	I			(Note 1)
Service Activation Systems			I	I			(Note 1)
Service Maintenance Systems			I	I			(Note 1)
Switching Systems			I	I			(Note 1)
SS7 Signaling	I	I					(Note 1)
Employee Training	I		I				(Note 1)

Although costs were requested in a per-MSA basis, it cannot be determined whether all of these costs would be duplicated if this optimization measure is applied to multiple MSAs.

Service Provider Questionnaire - Inconsistent Rate Centers

Time to Implement Ranges	0-6 Months	6-12 Months I	12-18 Months	18-24 Months I	2-4 years	>4 years
Time to Implement						
		6 to 9 months		24 months		

$20-million is a lower limit to this cost range. The ATF has no additional information as to what the upper limit of SPs' estimates might be with the exception of the one response.

IRC NOTES:

1. ELCAs, Inconsistent Rate Centers, and Location Portability are alternatives that this SP has not yet studied or quantified.
   These alternatives are related in that they drive toward a revised approach for rating calls across all service providers.
   Any perturbation of the current approach has network and systems (particularly billing systems) effects that are not yet fully understood by the industry.
   For example, inconsistent rate centers impact the efficiency of 1000s block administration. Likewise, true location portability divorces call rating from the TN which has yet to be studied implications for the industry.
   This SP's view is that the industry would need to begin a process of identifying and narrowing the issues and standards that are involved with
   true location portability before the company would be in a position to comment on the effectiveness or value of the alternatives.

Although costs were requested in a per-MSA basis, it cannot be determined whether all of these costs would be duplicated if this optimization measure is applied to multiple MSAs.

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Although costs were requested in a per-MSA basis, it cannot be determined whether all of these costs would be duplicated if this optimization measure is applied to multiple MSAs.

Service Provider Questionnaire - Location Portability

Total Responses Received: 6 (1 respondent did not provide any specific responses to questions) 3 respondents provided data

Subscribers:	A <1K	B 1K-10K	C 10K-50K	D 50K-100K	E 100K-500K	F >500K
Responses:			I	I		III

Question	A <$10K	B $10K-100K	C $100K-$1M	D $1M-$5M	E $5M - $20M	F # >$20M	
Tariffs, Pricing Changes & Contracts	I			I			(Note 1)
Customer Education			I		I		(Note 1)
Customer Care & Billing Systems				I		I	(Note 1)
Service Activation Systems				I		I	(Note 1)
Service Maintenance Systems			I			I	(Note 1)
Switching Systems			I			I	(Note 1)
SS7 Signaling			I			I	(Note 1)
Employee Training		I		I			(Note 1)

Although costs were requested in a per-MSA basis, it cannot be determined whether all of these costs would be duplicated if this optimization measure is applied to multiple MSAs.

Service Provider Questionnaire - Location Portability

Time to Implement Ranges	0-6 Months	6-12 Months	12-18 Months	18-24 Months	2-4 years I	>4 years I	(Note 1)
Time to Implement							
					48 months	5 to 10 years	

$20-million is a lower limit to this cost range. The ATF has no additional information as to what the upper limit of SPs' estimates might be with the exception of the one response.

Location Portability NOTES:

1. ELCAs, Inconsistent Rate Centers, and Location Portability are alternatives that this SP has not yet studied or quantified.
   These alternatives are related in that they drive toward a revised approach for rating calls across all service providers.
   Any perturbation of the current approach has network and systems (particularly billing systems) effects that are not yet fully understood by the industry.
   For example, inconsistent rate centers impact the efficiency of 1000s block administration. Likewise, true location portability divorces call rating from the TN which has yet to be studied implications for the industry.
   This SP's view is that the industry would need to begin a process of identifying and narrowing the issues and standards that are involved with
   true location portability before the company would be in a position to comment on the effectiveness or value of the alternatives.

Although costs were requested in a per-MSA basis, it cannot be determined whether all of these costs would be duplicated if this optimization measure is applied to multiple MSAs.

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Although costs were requested in a per-MSA basis, it cannot be determined whether all of these costs would be duplicated if this optimization measure is applied to multiple MSAs.

Service Provider Questionnaire - Modify CO Code Guidelines

Total Responses Received: 6 (1 respondent did not provide any specific responses to questions) 3 respondents provided data

Subscribers:	A <1K	B 1K-10K	C 10K-50K	D 50K-100K	E 100K-500K	F >500K
Responses:			I	I		III

Question	A <$10K	B $10K-100K	C $100K-$1M	D $1M-$5M	E $5M - $20M	F # >$20M	
Tariffs, Pricing Changes & Contracts	I	I					(Note 1)
Customer Education	I, I						(Note 1)
Customer Care & Billing Systems		I, I					(Note 1)
Service Activation Systems		I	I				(Note 1)
Service Maintenance Systems		I, I					(Note 1)
Switching Systems	I		I				(Note 1)
SS7 Signaling	I	I					(Note 1)
Employee Training		I, I					(Note 1)

Although costs were requested in a per-MSA basis, it cannot be determined whether all of these costs would be duplicated if this optimization measure is applied to multiple MSAs.

Service Provider Questionnaire - Modify CO Code Guidelines

Time to Implement Ranges	0-6 Months	6-12 Months I, I	12-18 Months	18-24 Months	2-4 years	>4 years
Time to Implement						
		8 months				
		6 to 9 months				

(Note 1)

$20-million is a lower limit to this cost range. The ATF has no additional information as to what the upper limit of SPs' estimates might be with the exception of the one response.

Modification of industry Guidelines NOTES:

1. The adminitrative and operational costs to implement these potential changes to the industry guidelines would depend upon which changes were adopted.

Although costs were requested in a per-MSA basis, it cannot be determined whether all of these costs would be duplicated if this optimization measure is applied to multiple MSAs.

Service Provider Questionnaire - NXX-X Code Sharing

Total Responses Received: 6 (1 respondent did not provide any specific responses to questions) 3 respondents provided data

Subscribers:	A <1K	B 1K-10K	C 10K-50K	D 50K-100K	E 100K-500K	F >500K
Responses:			I	I		III

Question	A <$10K	B $10K-100K	C $100K-$1M	D $1M-$5M	E $5M - $20M	F # >$20M	
Tariffs, Pricing Changes & Contracts	I	I					(Note 1)
Customer Education	I, I						(Note 1)
Customer Care & Billing Systems			I	I			(Note 1)
Service Activation Systems			I	I			(Note 1)
Service Maintenance Systems			I	I			(Note 1)
Switching Systems		I			I		(Note 1)
SS7 Signaling	I					I	(Note 1)
Employee Training		I	I				(Note 1)

Although costs were requested in a per-MSA basis, it cannot be determined whether all of these costs would be duplicated if this optimization measure is applied to multiple MSAs.

Service Provider Questionnaire - NXX-X Code Sharing

Time to Implement Ranges	0-6 Months	6-12 Months	12-18 Months I	18-24 Months I	2-4 years	>4 years
Time to Implement						
			1 year	24 months		

(Note 1)

$20-million is a lower limit to this cost range. The ATF has no additional information as to what the upper limit of SPs' estimates might be with the exception of the one response.

NXX-X Code Sharing NOTES:

1. Given that LNP-based pooling is the NANC-endorsed and preferable technical solution for NXX code sharing, this SP has not undertaken any analysis of the costs to implement this alternative.

Although costs were requested in a per-MSA basis, it cannot be determined whether all of these costs would be duplicated if this optimization measure is applied to multiple MSAs.

Service Provider Questionnaire - Overlay NPA

Total Responses Received: 6 (1 respondent did not provide any specific responses to questions) 3 respondents provided data

Subscribers:	A <1K	B 1K-10K	C 10K-50K	D 50K-100K	E 100K-500K	F >500K
Responses:			I	I		III

Question	A <$10K	B $10K-100K	C $100K-$1M	D $1M-$5M	E $5M - $20M	F # >$20M
Tariffs, Pricing Changes & Contracts	I, I				I (Note 1)	
Customer Education		I, I			I (Note 1)	
Customer Care & Billing Systems	I		I		I (Note 1)	
Service Activation Systems	I		I		I (Note 1)	
Service Maintenance Systems	I		I		I (Note 1)	
Switching Systems		I		I	I (Note 1)	
SS7 Signaling	I	I			I (Note 1)	
Employee Training	I	I			I (Note 1)	

Although costs were requested in a per-MSA basis, it cannot be determined whether all of these costs would be duplicated if this optimization measure is applied to multiple MSAs.

Service Provider Questionnaire - Overlay NPA

Time to Implement Ranges	0-6 Months	6-12 Months I, I	12-18 Months I	18-24 Months	2-4 years	>4 years
Time to Implement						
		12 months	12 to 18 months			
		6 to 12 months				

$20-million is a lower limit to this cost range. The ATF has no additional information as to what the upper limit of SPs' estimates might be with the exception of the one response.

Overlay NPA NOTES:

1. First overlay costs - E; 12-18 months; Subsequent overlays - D; 4 - 6 months.

Although costs were requested in a per-MSA basis, it cannot be determined whether all of these costs would be duplicated if this optimization measure is applied to multiple MSAs.

Service Provider Questionnaire - Route Indexing

Total Responses Received: 6 (1 respondent did not provide any specific responses to questions) 3 respondents provided data

Subscribers:	A <1K	B 1K-10K	C 10K-50K	D 50K-100K	E 100K-500K	F >500K
Responses:			I	I		III

Question	A <$10K	B $10K-100K	C $100K-$1M	D $1M-$5M	E $5M - $20M	F # >$20M	
Tariffs, Pricing Changes & Contracts	I						(Note 1), (Note 2)
Customer Education	I						(Note 1), (Note 2)
Customer Care & Billing Systems			I				(Note 1), (Note 2)
Service Activation Systems		I					(Note 1), (Note 2)
Service Maintenance Systems		I					(Note 1), (Note 2)
Switching Systems		I					(Note 1), (Note 2)
SS7 Signaling	I						(Note 1), (Note 2)
Employee Training		I					(Note 1), (Note 2)

Although costs were requested in a per-MSA basis, it cannot be determined whether all of these costs would be duplicated if this optimization measure is applied to multiple MSAs.

Service Provider Questionnaire - Route Indexing

Time to Implement Ranges	0-6 Months	6-12 Months	12-18 Months I	18-24 Months	2-4 years	>4 years
Time to Implement						
			12 months			

(Note 1), (Note 2)

$20-million is a lower limit to this cost range. The ATF has no additional information as to what the upper limit of SPs' estimates might be with the exception of the one response.

Route Indexing NOTES:

1. N/A
2. Per the ATF, information on these alternatives is no longer being requested.

Although costs were requested in a per-MSA basis, it cannot be determined whether all of these costs would be duplicated if this optimization measure is applied to multiple MSAs.

Service Provider Questionnaire - Traditional Rate Center Consolidation

Total Responses Received: 6 (1 respondent did not provide any specific responses to questions) 4 respondents replied

Subscribers:	A <1K	B 1K-10K	C 10K-50K	D 50K-100K	E 100K-500K	F >500K
Responses:			I	I		III

Question	A <$10K	B $10K-100K	C $100K-$1M	D $1M-$5M	E $5M - $20M	F # >$20M
Tariffs, Pricing Changes & Contracts	I, I					I (Note 1), I (Note 5)
Customer Education		I, I		I (Note 2)		I (Note 5)
Customer Care & Billing Systems		I	I		I (Note 3)	I (Note 5)
Service Activation Systems		I	I (Note 4), I			I (Note 5)
Service Maintenance Systems	I	I		I (Note 2)		I (Note 5)
Switching Systems	I	I	I (Note 4)			I (Note 5)
SS7 Signaling	I	I				I (Note 5) (Note 6)
Employee Training	I	I		I (Note 2)		I (Note 5)

Although costs were requested in a per-MSA basis, it cannot be determined whether all of these costs would be duplicated if this optimization measure is applied to multiple MSAs.

Service Provider Questionnaire - Traditional Rate Center Consolidation

Time to Implement Ranges	0-6 Months I	6-12 Months I,I	12-18 Months	18-24 Months	2-4 years I (Note 5)	>4 years
Time to Implement						
	3 to 6 months	8 months			2.5 years	
		4 to 12 months				

$20-million is a lower limit to this cost range. The ATF has no additional information as to what the upper limit of SPs' estimates might be with the exception of the one response.

RCC Notes:

1. Respondent identified costs between A-F
2. Respondent identified costs between A-D
3. Respondent identified costs between A-E
4. Respondent identified costs between A-C
5. The only cost data available for one SP is based upon a study completed for one state.
   This study indiciates that the costs, without considering revenue changes, would be in the F cost range and that the time to implement would be at least 2.5 years after regulatory manadate.
6. One SP did not provide any response to this question.

Although costs were requested in a per-MSA basis, it cannot be determined whether all of these costs would be duplicated if this optimization measure is applied to multiple MSAs.

Service Provider Questionnaire - Unassigned Number Pooling

Total Responses Received: 6 (1 respondent did not provide any specific responses to questions)

Subscribers:	A <1K	B 1K-10K	C 10K-50K	D 50K-100K	E 100K-500K	F >500K
Responses:			I	I		III

Question	A <$10K	B $10K-100K	C $100K-$1M	D $1M-$5M	E $5M - $20M	F # >$20M	
Tariffs, Pricing Changes & Contracts	I	I	I (Note 6)				(Note 1), (Note 2)
Customer Education	I, I		I, I				(Note 1)
Customer Care & Billing Systems		I		I		I, I (Note 7)	(Note 1)
Service Activation Systems		I		I		I (Note 3), I	(Note 1)
Service Maintenance Systems		I	I,I			I (Note 7)	(Note 1)
Switching Systems	I	I	I			I	(Note 1)
SS7 Signaling		I		I	I (Note 4)		(Note 1)
Employee Training	I		I, I				(Note 1)

Although costs were requested in a per-MSA basis, it cannot be determined whether all of these costs would be duplicated if this optimization measure is applied to multiple MSAs.

Service Provider Questionnaire - Unassigned Number Pooling

Time to Implement Ranges	0-6 Months	6-12 Months I, I	12-18 Months I	18-24 Months	2-4 years	>4 years
Time to Implement						
		8 months	10 to 15 months			
		6 to 9 months				

I (Note 1), I (Note 5)

$20-million is a lower limit to this cost range. The ATF has no additional information as to what the upper limit of SPs' estimates might be with the exception of the one response.

Unassigned Number Pooling NOTES:

1. Unassigned Number Porting is not sufficiently defined at this time to estimate costs or time frames for implementation. Both the costs and time frame for implementation are dependent upon the application of UNP and the scope of its implementation.
2. Regulatory decisions on cost allocation and recovery may impact tarrifs and pricing.
3. Includes allocated costs of shared administrative systems (e.g. NPAC transactions, industry pool and administrator, etc.)
4. Includes cost of SCP enhancements.
5. Implementation intervals cannot be estimated until industry requirements are identified.
6. SP identified costs between A-C.
7. SP identified costs are included in correspondingly market total.

Although costs were requested in a per-MSA basis, it cannot be determined whether all of these costs would be duplicated if this optimization measure is applied to multiple MSAs.

Service Provider Questionnaire - Individual Telephone Number Pooling

Number of respondents: 6 (1 respondent did not provide any specific responses to questions)

Subscribers:	A <1K	B 1K-10K	C 10K-50K	D 50K-100K	E 100K-500K	F >500K
Responses:			I	I		III

Question	A <$10K	B $10K-100K	C $100K-$1M	D $1M-$5M	E $5M - $20M	F # >$20M
Tariffs, Pricing Changes & Contracts	I	I	I (Note 6)			
Customer Education	I	I	I, I			
Customer Care & Billing Systems			I, I		I	I (Note 4 & 8), I
Service Activation Systems				I		I, I, I (Note 2)
Service Maintenance Systems			I, I, (Note 6)		I	I (Note 7)
Switching Systems		I	I	I		I (Note 4), I
SS7 Signaling		I		I	I (Note 3)	I
Employee Training	I		I,I	I		I (Note 4)
Time to Implement Ranges	0-6 Months	6-12 Months	12-18 Months	18-24 Months	2-4 years	>4 years

(Note 1)

Although costs were requested on a per-MSA basis, it cannot be determined whether all of these costs would be duplicated if this optimization measure is applied to multiple MSAs.

			I (Note 5)		I	III
Time to Implement						
						Agree w/interval in ITN report
					36 months	
						4-6 years per ITN report
			12 - 18 months			
						4-6 years

$20-million is a lower limit to this cost range. The ATF has no additional information as to what the upper limit of SPs' estimates might be with the exception of the one response.

Although costs were requested on a per-MSA basis, it cannot be determined whether all of these costs would be duplicated if this optimization measure is applied to multiple MSAs.

ITN NOTES:

1. Regulatory decisions on cost allocation and recovery may impact tariffs and pricing
2. Includes allocated costs of shared administrative systems (e.g., NPAC transactions, industry pool and administrator, etc.)
3. Includes costs of SCP enhancements
4. Total Network Costs - F; Total Service Provider System Costs - F; ITN Administrator and ITN Administrator System Costs - F;
   4 - 6 years per ITN TF report
5. The time estimates provided in this report are dependent on vendor completion of required activities to support the specific number conservation option being described.
   Estimates to complete work assumes all vendors modifications are fully deployed and tested.
   Once the vendor schedules are available, a review of the SP interval would be appropriate to put the overall time estimates into a more specific time context.
6. Indicates costs for this category could be within categories A-C in the correspondingly marked total.
7. Costs have been included in combination with the response in Customer Care & Billing Systems.
8. Includes all SP OSS costs.

Although costs were requested on a per-MSA basis, it cannot be determined whether all of these costs would be duplicated if this optimization measure is applied to multiple MSAs.

Analysis Task Force
of the North American Numbering Council (NANC) Numbering Resource Optimization (NRO) Working Group

Co Chairs: Susan Baldwin and Karen Mulberry

August 10, 1998

Dear Telecommunication Industry Service Provider:

In a March 23, 1998 letter (attached) to Chairman Hasselwander of the North American Numbering Council (NANC), Mr. Richard A. Metzger, Chief of the FCC's Common Carrier Bureau (the Bureau), requested that NANC submit a report on national number pooling standards which could permit the implementation of a technology that may alleviate the recurring problems of area code exhausts. Mr. Metzger further stated that it would be helpful for the Bureau if NANC would also give number conservation solutions, other than pooling, a very high priority and expressed the hope that NANC and the state commissions will work cooperatively on these issues.

In response to this request from the Bureau, NANC recently established a Numbering Resource Optimization - Working Group (NRO-WG) to develop national recommendations for the FCC's consideration. This Working Group's efforts to look for ways to optimize the use of numbering resources have already been initiated. In large measure, the success of these efforts depend upon this group working closely with state commissions, equipment vendors, service providers and end users to receive their input and to reflect that input in developing recommendations to the FCC.

The Analysis Task Force (ATF) of the Number Resource Optimization Working Group (NRO-WG) seeks your assistance in analyzing several number conservation measures that are currently under consideration. Specifically, we seek your assistance in identifying potential costs and implementation time requirements for those alternatives which appear to require certain network enhancements or augmentation.

The ATF acknowledges that such information may be considered proprietary, and not normally disclosed. The information we seek, however, is not specific costs, but rather general cost ranges that can be aggregated and/or averaged to provide an overall picture of what service providers might expect if a particular alternative was pursued. The identification of the respondents will be withheld from any documentation on these alternatives.

Please report your best estimate of the average costs per MSA for deploying each of these alternatives. Assume that these alternatives would only be implemented in the top 100 MSAs nationwide. These costs should represent the implementation costs and one year's recurring costs of each of the alternatives. Please use the following cost ranges in reporting you're cost estimates:

A. <$10K
B. $10K - $100K
C. $100K - $1M
D. $1M - $5M
E. $5M - $20M
F. >$20M

In addition, would you please indicate the estimated range of subscribers you serve in each of the MSAs for which you are responding. Please use the table below to indicate the estimated subscriber range:

A. <1K
B. 1K - 10K
C. 10K - 50K
D. 50K - 100K
E. 100K - 500K
F. >500K

To aid in responding to this request, a completed example table illustrates the format to assist you in preparing your response. Values have been inserted into this example to demonstrate its potential use.

Please enter table entries to reflect your views on the cost for each the alternatives. This table format will also assist the Task Force in aggregating the data from all service providers to determine the comparative impact of each alternative to the industry. In addition, a description of the number conservation alternatives being considered is attached for your reference.

Your assistance in providing a response to the attached questions by August 28th would be greatly appreciated. Responses should be forwarded via the Internet to Karen Mulberry (karen.mulberry@mci.com) or Susan Baldwin (sbaldwin@econtech.com). Questions or clarifications regarding the attached questionnaire may be directed to Herb Manger, at 732-699-7919 (hmanger@notes.cc.bellcore.com) or Dan Gonos, at 248-539-7877 (dgonos@winstar.com).

Sincerely,

Karen Mulberry *Susan Baldwin*

Karen Mulberry
MCI
2400 North Glenville Dr.
Richardson TX 75082
ATF Co-Chair

Susan Baldwin
Ad Hoc Telecommunications Users Committee
Economics and Technology, Inc.
One Washington Mall
Boston, MA 02108
ATF Co-Chair

ATTACHMENTS

EXAMPLE

Company Name: ____**XYZ_Inc**._____

Company Contact: ____**John Smith**_____ Phone #:_____

Estimated Number of Subscribers Served in Analysis Area: ___**D**_____

Systems & Areas Impacted*	Rate Center Consolidation	Extended Local Calling	Geographic Splits	Inconsistent Rate Centers	Individual Telephone Number Pooling	1000's Block Admin.	Unassigned Number Pooling	Location Portability	NXX Code Sharing	Route Indexing	10 Digit Dialing	Modify CO Code Admin.	Overlay NPA	Reduce Demand for Numbering Resources
Tariffs, Pricing Changes & Contracts	B	B	B	B	A	A	A	D	A	A	A	A	A	A
Customer Education	B	B	B	B	B	B	B	C	A	A	C	A	C	A
Customer Care & Billing Systems	C	C	C	C	D	C	C	D	C	C	A	B	B	A
Service Activation Systems	B	B	C	B	D	C	C	C	C	B	B	B	B	A
Service Maintenance Systems	B	B	A	B	D	C	C	C	C	C	C	B	B	A
Switching Systems	C	C	B	C	C	C	C	D	C	B	B	B	B	A
SS7 Signaling	A	A	A	C	C	B	B	D	B	B	B	A	B	A
Employee Training	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Time to Implement														

***This questionnaire is seeking implementation costs, not revenue impacts or shifts.**

Company Name: _____

Company Contact: _____ Phone #:_____

Estimated Number of Subscribers Served in Analysis Area: _____

Systems & Areas Impacted*	Rate Center Consolidation	Extended Local Calling	Geographic Splits	Inconsistent Rate Centers	Individual Telephone Number Pooling	1000's Block Admin.	Unassigned Number Pooling	Location Portability	NXX Code Sharing	Route Indexing	10 Digit Dialing	Modify CO Code Admin.	Overlay NPA	Reduce Demand for Numbering Resources
Tariffs, Pricing Changes & Contracts														
Customer Education														
Customer Care & Billing Systems														
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Service Maintenance Systems														
Switching Systems														
SS7 Signaling														
Employee Training														
Time to Implement														

***This questionnaire is seeking implementation costs, not revenue impacts or shifts.**

Standards Committee T1
Telecommunications

Accredited by the American National
Standards Institute

1200 G Street, N.W.
Suite 500
Washington, D.C. 20005
202-434-8845
FAX: 202-347-7125

Gerald H. Peterson
Chairman

E. Raymond Hapeman
Vice Chairman

Harold Daugherty
Director

A Sponsored Committee of

Alliance for Telecommunications
Industry Solutions

T1S1/98-254R1
T1S1.6/98-272R2

September 8, 1998

Mr. Mike Whaley
Co-Chair NANC NRO
US West Communications
700 West Mineral, Room MND 19.28
Littleton, CO 80120

Subject: T1S1.6 Number Pooling Work Plan

Dear Mike:

T1S1 is nearing completion of its work on number portability. Supported by efforts of others, T1S1.6 has completed a first step in producing National Technical Requirements for Number Portability that are currently in T1 Letter Ballot. Following the close of the letter ballot comment period on August 26, 1998, resolving the ballot comments will be the T1S1.6 highest priority.

The documents being balloted are:

T1LB 702, "Draft Proposed Technical Requirements - Number Portability - Operator Services Switching Systems"
T1LB 703, "Draft Proposed Technical Requirements - Number Portability - Switching Systems"
T1LB 704, "Draft Proposed Technical Requirements - Number Portability - Database and Global Title Translation"
T1LB 705, "Draft Proposed Technical Report - Number Portability Program Management Plan"

Should you wish to review these documents, you can download them from:

http://www.t1.org/index/10001.htm

T1S1.6 will continue to develop further requirements for number portability, number pooling, wireless-wireline integration, portability outside the rate center (location

portability) and develop proposed ITU-T contributions for number portability (see attached work plan). At the September T1S1.6 meeting in Dallas, Ballots T1LB 702, and T1LB 705 were resolved. In future meetings T1S1.6 will focus on number pooling and resolving the T1LB 703 and T1LB 704 ballot. Final text for Letter Ballots 702 and 705 will be available on the T1 web site (http://www.t1.org) within one month.

We welcome future liaisons from your organization on these topics. If you have any questions, please contact Brian Foster at brian.foster@telops.gte.com or 972-718-6350.

Sincerely,

Jerry Peterson
Committee T1 Chairman

Att: T1S1.6 Work Plan

cc: Alan Hasselwander, NANC Chair
Ben Childers, NRO Co-Chair
Beth O'Donnell, NRO Co-Chair
Tom Sweeney, NANC LNPA Co-Chair
Marilyn Murdock, NANC LNPA Co-Chair
Ray Hapeman, Committee T1 Vice-Chair
Wayne Zeuch, T1S1 Chairman
Jay Hilton, T1S1 Vice-Chair
Brian Foster, T1S1.6 Chairman
Doris Lebovits, T1S1.6 Vice-Chair
Harold Daugherty, T1 Secretariat
John Manning, ATIS

2H1998 T1S1.6 Work Plan

Denver CO. Meeting, July 21 thru 23, 1998

- Resolve 1000's block number pooling contributions.
- Review new number pooling contributions.
- Review INC number pooling document/liaison.
- Develop a documentation plan for number pooling requirements.
- Select baseline document editor(s).

Dallas TX. Meeting, August 31 thru September 3, 1998

- Resolve number portability letter ballot comments.
- Review new and open number pooling contributions (if time is available).

San Antonio TX. Meeting, October 5 thru 9, 1998

- Resolve switch and NPDB number portability letter ballot comments.
- Default ballot the switch and NPDB number portability requirements
- Review new and open number pooling contributions.

Naperville Il. Meeting, November 3 thru 5, 1998

- Review new and open number pooling contributions.
- Resolve all outstanding issues.
- Review the number pooling requirements.

Long Branch NJ. Meeting, December 7 thru 10, 1998

- Resolve the switch and NPDB number portability requirements default ballot comments.
- Resolve all outstanding issues.
- Line by line review of the number pooling requirements.
- Ballot the number pooling requirements.

End User Questionnaire

Question	A <$5K	B $5K-$10K	C $10K-$50K	D $50K-100K	E $100K-$500K	F $500K-$1M	G $1M-$10M	H > $10M	unknown	N/A
Area Code Split										
Out-of-pocket costs, etc.		I	I		I (Note 1), I			I		
Intangible costs	I I							I	I I	
Implementation effort	I	I	I		I	I				
Miscellaneous costs	I I		I	I (Note 2)	I					I
Numbering Changes, Additions, etc.										
Costs imposed upon organizations that maintain data bases, etc.	I		I		I	I I				
10-Digit Dialing										
Costs of dialing pattern/protocol changes	I		I(Note 3), I			I		I		
Rate Center Consolidation										
Cost of reprogramming CPE to accommodate local calling area changes	I(note 4), I				I I				I	
Specialized Overlays										
Cost if existing/cellular/PCS phone numbers were assigned to a new area code	I (Note 5), I		I I			I			I	
Cost if any new cellular/PCS phone numbers were assigned to a new area code	I (Note 5), I				I				I	I

NOTES:
The questions, as shown in the matrix, are abbreviated. Please see Attachment C for the complete questions

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5. "Expect cellular carrier would provide this service."

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RESPONDENT INFORMATION

Total - 5	Access Lines	Employees	Database records containing telephone numbers
1. Large Businesses	45,000	120,000	> 30-million
2. Consumer advocates agencies estimating their constituents' costs	2-million	N/A	unknown
3. Consumer Advocate Agencies estimating their own agencies' costs	100, 8163, 23	30, 7673, 57	10,000, unknown, between 5,000 and 10,000

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Analysis Task Force

of the North American Numbering Council (NANC) Numbering Resource Optimization (NRO) Working Group

Co Chairs: Susan Baldwin and Karen Mulberry

August 4, 1998

Dear User of Telecommunications Services:

In a March 23, 1998 letter (attached) to Chairman Hasselwander of the North American Numbering Council (NANC), Mr. Richard A. Metzger, Chief of the Federal Communications Commission's Common Carrier Bureau (the Bureau), requested the NANC to submit a report on national number pooling standards which could permit the implementation of a technology that may alleviate the recurring problems of area code exhausts. Mr. Metzger further stated that it would be useful for the Bureau if the NANC would also give number conservation solutions, other than pooling, a very high priority and expressed the hope that the NANC and the state commissions will work cooperatively on these issues.

In response to this request from the Bureau, the NANC recently established a Numbering Resource Optimization -Working Group (NRO-WG) to recommend methods to develop national recommendations for the FCC's consideration. This Working Group's efforts to look for ways to optimize the use of our numbering resources have already been initiated. In large measure, the success of these efforts depends upon this group working closely with state commissions, equipment vendors, service providers, and end users to receive their input and to reflect that input in developing recommendations to the FCC.

The Analysis Task Force (ATF) of the NRO-WG seeks your assistance in analyzing the impact of numbering optimization measures. Specifically we seek your assistance in identifying the costs that end users may confront, particularly those costs associated with implementing a new numbering change.

The following range categories may be used in providing your response:

a) Less than $5,000
b) $5,000 to $9,999
c) $10,000 to $49,999
d) $50,000 to $99,999
e) $100,000 to $499,999
f) $500,000 to $999,999
g). $1-million to $9.9-million
h) More than $10-million

Analysis Task Force

of the North American Numbering Council (NANC) Numbering Resource Optimization (NRO) Working Group

Co Chairs: Susan Baldwin and Karen Mulberry

Your assistance in providing a response to the attached questions by August 28, 1998, would be greatly appreciated. Such responses should be forwarded via the Internet to Susan Baldwin (sbaldwin@econtech.com) or Karen Mulberry (karen.mulberry@mci.com) or faxed to Susan Baldwin at 617-227-5535. Questions or clarifications regarding the attached questionnaire may be directed to Susan Baldwin by e-mail or 617-227-0900 or Karen Mulberry by e-mail or 972-729-7914. Thank you for your attention to and assistance with this important matter.

Sincerely,

Karen Mulberry
MCI
2400 North Glenville Dr.
Richardson TX 75082
ATF Co-Chair

Susan Baldwin
Ad Hoc Telecommunications Users Committee
Economics and Technology, Inc.
One Washington Mall
Boston MA 02108
ATF Co-Chair

ATTACHMENT

Analysis Task Force

of the North American Numbering Council (NANC) Numbering Resource Optimization (NRO) Working Group

Co Chairs: Susan Baldwin and Karen Mulberry

ATF User Cost Questionnaire

Background: The introduction of a new area code may pose certain costs associated with implementing a numbering change. The following questions concern these costs.

Please provide an estimate of the costs your organization (or those you represent) has incurred or would incur in order to respond to an area code change. Where an estimate may not be possible (e.g., for an intangible cost), please indicate whether the cost specified applies. Please also identify any sources of cost that are not included among the examples given below:

1. Change in your organization's own telephone number(s) and/or in other telephone numbers in your local area arising from an area code split:

    a. Out-of-pocket costs incurred for reprinting stationery, signage, printed materials, brochures, product manuals and product packaging; costs associated with notifying customers (in the case of a business) or likely callers; costs associated with reprogramming, modifying, upgrading or replacing customer premises equipment that may be required to accommodate a change in area code. Also include costs incurred to reflect number changes. These include costs associated with updating PBX routing tables, revising personal directories, customer lists, reprogramming of automatic dialing equipment (such as alarm dialers, point-of-sale terminals, and personal speed call arrangements (whether CO or CPE based)).

        Estimate of cost: $ _____

    b. Intangible costs: Costs associated with loss of business (when a potential caller cannot reach a business, for example, whose number has changed), or loss of social contact (when residential customer cannot be reached).

        Estimate of cost: $ _____

    c. Implementation effort. Time and inconvenience, planning efforts, coordination of notices and other responses.

        Estimate of cost: $ _____

d. Miscellaneous costs, such as those associated with returning wireless phones to carriers for reprogramming wireless phones subject to a number change.

Estimate of cost: $ _____

2. Costs imposed upon organizations that maintain customer/client/citizen data bases in which telephone numbers are included. These include costs associated with mechanized and manual updating of data base entries to reflect area code changes or other telephone number (TN) changes, costs engendered by errors or obsolete data, loss of business, public safety concerns when TN information is not current or correct, loss of contact with customers/clients/citizens.

Estimate of cost: $ _____

3. Costs of dialing patterns/protocol changes (e.g., with the introduction of mandatory 10/11-digit dialing). These would include costs associated with reprogramming dialing devices, speed call lists, increased dialing time, increase in misdialed numbers, potential impact upon public safety where children/elderly have difficulty dialing and/or remembering additional digits.

Estimate of cost: $ _____

Background: The implementation of certain number optimization measures may result in certain costs. The following questions concern these costs.

For the following questions, please read the brief description of the number optimization measure, and then respond to the measure-specific questions.

Rate Center Consolidation is a measure that is being used to reduce the demand for NXX codes. This measure entails combining existing rate centers into a smaller number of rate centers so that carriers would require fewer NXX codes to serve an area. The degree to which rate center consolidation requires changes to local calling areas depends upon the magnitude of the consolidation and the local calling areas that presently exist in a given jurisdiction. One cost to end users that could occur is an increase to local rates to offset a decrease in toll charges. Other than this type of cost, please identify, and quantify where possible, costs associated with an expansion of local calling areas in your area.

1. Cost of reprogramming CPE to accommodate local calling area changes:

Estimate of cost: $ _____

Specialized Overlays: would be defined over a geographic footprint that corresponds to one or more geographic NPA but is used to assigned numbers to a subset of service providers, e.g., wireless providers.

Policymakers may be considering policies that would require customers to change their cellular/PCS phone number rather than their home or business phone numbers.

1. What specific costs would you incur if required to change your or your company's cellular/PCS phone numbers to a new special area code? If any new cellular/PCS phone numbers were assigned to a new special area code?

_____

Information about the respondent

Access lines of organization/business: _____

Total number of employees: _____

Total number of database records containing telephone numbers: _____

Revenues of organization/business: _____

Number of members in organization: _____

Co Chairs: Susan Baldwin and Karen Mulberry

ATTACHMENT 1

[Text of Chief, CCB letter to NANC]

March 23, 1998

Chairman Alan C. Hasselwander
North American Numbering Council
4140 Clover Street
Honeoye Falls, NY 14472-9323

Dear Chairman Hasselwander:

Thank you for your letters of November 5, 1997 and December 22, 1997, reporting to the Common Carrier Bureau (Bureau) on the North American Numbering Council's (NANC's) progress in developing a recommendation for the Federal Communications Commission (Commission) on national standards for number pooling. The NANC's recommendation will be an important step in the development of national standards for number pooling that will benefit telecommunications carriers and consumers. The Bureau is looking forward to receiving this recommendation.

In recent months, the Bureau has received inquiries from state public utility commissions and others regarding implementation of number conservation methods that will decrease the frequency of the need for area code relief. In your letters, you state that the NANC has tentatively concluded that the adoption of number pooling is in the public interest and could mitigate the problem of number exhaust. The NANC also has concluded that national guidelines for number pooling architecture, implementation, and administration are appropriate. You also note in your letter that some state public utility commissions have adopted or are considering adopting number pooling requirements and that is the NANC's position that states taking those actions do so at the risk that their decisions may have to be modified to be consistent with national guidelines on number pooling. The Bureau is monitoring these developments and is also aware that some state commissions have established task forces to examine the feasibility and utility of number pooling.

As you know, the NANC plays an important role in facilitating the development of an industry consensus on how number pooling should be implemented and the Bureau fully supports NANC's current efforts in studying pooling and preparing a report for the Commission's consideration. We also believe that efforts by state commissions will provide useful information that should help further the development of this capability. It is our hope that the NANC and the

state commissions will work cooperatively on these issues. The NANC is encouraged to respond to state commission requests for information regarding the NANC's work in studying pooling, and, where possible, to use information obtained from state commissions in developing the NANC report. The NANC's report on national number pooling standards will be critical to the implementation of a technology that may alleviate the recurring problem of area code exhaust. For this reason, we request that NANC submit its report to the Commission six months from the date of this letter. It would be most helpful for the Bureau if the NANC's report could be sufficiently detailed to support, both technically and operationally, a uniform, nationwide system for pooling by December, 1999. It would also be helpful to the Bureau if the NANC would give number conservation solutions, other than pooling, a very high priority.

Thank you, as always, for your continued efforts on these complex and important issues. Increased availability of numbering resources for all telecommunications carriers will promote competition, and the NANC's endeavors to that end are invaluable.

Sincerely,

/s/
A. Richard Metzger, Jr.
Chief, Common Carrier Bureau

End User Questionnaire

Question	A <$5K	B $5K-$10K	C $10K-$50K	D $50K-100K	E $100K-$500K	F $500K-$1M	G $1M-$10M	H > $10M	unknown	N/A
Area Code Split										
Out-of-pocket costs, etc.		I	I		I (Note 1), I			I		
Intangible costs	I I							I	I I	
Implementation effort	I	I	I		I	I				
Miscellaneous costs	I I		I	I (Note 2)	I					I
Numbering Changes, Additions, etc.										
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10-Digit Dialing										
Costs of dialing pattern/protocol changes	I		I(Note 3), I			I		I		
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Cost of reprogramming CPE to accommodate local calling area changes	I(note 4), I				I I				I	
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Cost if existing/cellular/PCS phone numbers were assigned to a new area code	I (Note 5), I		I I			I			I	
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NOTES:
The questions, as shown in the matrix, are abbreviated. Please see Attachment C for the complete questions

1. The respondent estimated an average cost of $20 per employee for time spent deciding how to deal with a number change and for expenses for executing those changes.

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4. Per PBX, if all done simultaneously, in the $100,000 - $500,000 range

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RESPONDENT INFORMATION

Total - 5	Access Lines	Employees	Database records containing telephone numbers
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Analysis Task Force

of the North American Numbering Council (NANC) Numbering Resource Optimization (NRO) Working Group

Co Chairs: Susan Baldwin and Karen Mulberry

July 30, 1998

Dear Telecommunications Industry Supplier:

In a March 23, 1998 letter (attached) to Chairman Hasselwander of the North American Numbering Council (NANC), Mr. Richard A. Metzger, Chief of the FCC's Common Carrier Bureau (the Bureau), requested the NANC to submit a report on national number pooling standards which could permit the implementation of a technology that may alleviate the recurring problems of area code exhausts. Mr. Metzger further stated that it would be helpful for the Bureau if the NANC would also give number conservation solutions, other than pooling, a very high priority and expressed the hope that the NANC and the state commissions will work cooperatively on these issues.

In response to this request from the Bureau, the NANC recently established a Numbering Resource Optimization - Working Group (NRO-WG) to develop national recommendations for the FCC's consideration. This Working Group's efforts to look for ways to optimize the use of our numbering resources have already been initiated. In large measure, the success of these efforts depends upon this group working closely with state commissions, equipment vendors, service providers and end users to receive their input and to reflect that input in developing recommendations to the FCC.

The Analysis Task Force (ATF) of the Number Resource Optimization Working Group (NRO-WG) seeks your assistance in analyzing several number conservation measures that are currently under consideration. Specifically, we seek your assistance in identifying potential network costs and timing requirements for those alternatives that appear to require certain network enhancements or augmentation.

The ATF acknowledges that such information is usually considered as proprietary, and not normally disclosed beyond a supplier's immediate customer(s). The information we seek, however, is not firm price quotes from each supplier, but rather general price ranges that can be aggregated and/or averaged to provide an overall picture of what service providers might expect if a particular alternative was pursued. The identification of the respondents will be withheld from any documentation on these alternatives.

The following range categories may be used in providing your responses. All prices should be identified and reported on an individual network element basis (e.g., per switch):

A) less than $50,000
B) $51,000 to $100,000
C) $101,000 to $200,000
D) $201,000 to $500,000
E) $501,000 to $1,000,000
F) $1,001,000 to $2,000,000
G) $2,001,000 to $5,000,000
H) $5,001,000 to $10,000,000
I) $10,001,000 to $50,000,000
J) $50,001,000 to $100,000,000
K) above $100,000,000

Your assistance in providing a response to the attached questions by August 28th would be greatly appreciated. Documentation regarding each alternative is also attached. Such responses should be forwarded via the Internet to Karen Mulberry (karen.mulberry@mci.com) or Susan Baldwin (sbaldwin@ECONTECH.COM). Questions or clarifications regarding the attached questionnaire may be directed to Brian Baldwin at 847-248-5324 or Mitch Kaufman at 703-918-6083.

Sincerely,

Karen Mulberry
MCI
2400 North Glenville Dr.
Richardson TX 75082
ATF Co-Chair

Susan Baldwin
Ad Hoc Telecommunications Users Committee
Economics and Technology, Inc.
One Washington Mall
Boston, MA 02108
ATF Co-Chair

ATTACHMENTS

cc: Telecommunications Industry Supplier Contact list

Mr. Larry Hulbert
Vice President
Alcatel Network Systems
MS 406-110
1225 N. Alma
Richardson, TX 75081

Mr. Peter C. Waal
Vice President, Strategic
Business Development
DSC Communications
Corporation
1000 Cort Road-MS035
Plano, TX 75075-5813

Mr. Bo Hedfors
President
Ericsson, Inc.
740 E. Campbell Road
Richardson, TX 75081

Mr. Gary Smith
President
Glenayre
11360 Lakefield Drive
Duluth, GA 30097

J. Patrick Rice
Director, Major Accounts
Tekelec
Enterprise Center
5151 McCrimmon Parkway,
Suite 216
Morrisville, NC 27560

Mr. Matt Wisk
Marketing Director
Nokia Mobile Phones
2300 Valley View Lane, #100
Irving, TX 75062

Mr. Joe Kingrey
Manager, Number Services
Northern Telecom Inc.
4001 E Chapel Hill-Nelson Hwy.
Research Triangle Park, NC
27709

Mr. Fred Fromm
President and CEO
Siemens Telecom Networks
900 Broken Sound Parkway
Boca Raton, FL 33487

Mr. Eric E. Sumner, Jr.
Architect and Chief Technical
Officer
Lucent Technologies, Inc.
Room C3D04
283 King George Road
Warren, NJ 07059

Richard A. Orriss
Vice President – Intelligent
Network Systems
Bellcore
RRC 4A473
444 Hose Lane
Piscataway, NJ 08854-4182

Analysis Task Force

of the North American Numbering Council (NANC) Numbering Resource Optimization (NRO) Working Group

Co Chairs: Susan Baldwin and Karen Mulberry

ATF Network Vendor Cost Questionnaire

The Analysis Task Force (ATF) of the Number Resources Optimization Working Group seeks your assistance in finding answers to the following questions regarding timing and costs for specific enhancements to the Public Switched Network. Respondents are requested to review the attached detailed descriptions of each number optimization alternative to better understand the questions being asked, and to assist the ATF in identifying any additional questions that should be asked, but are not captured below.

Location Number Portability

Q1. Bellcore GR-2936-CORE proposes that LNP data bases (e.g., SCPs) contain specific information identifying the geographic location of the called (and perhaps calling) party on calls involving location-ported numbers. This geographic information is referred to as the Geographic Unit Building Block (GUBB). Please provide timing and costs for adding this GUBB information to the data base record.

Q2. Bellcore GR-2936-CORE proposes that GUBB information associated with data base (e.g., SCP) records for location-ported numbers be included in the (LNP) query response as a new parameter. Please provide timing and costs for adding this new parameter to the query response message.

Q3. Bellcore GR-2936-CORE proposes that SSPs perform a digit analysis on the GUBB information received in the LNP query response for the purpose of determining toll discrimination and rating. Please provide timing and costs for adding this capability to SSPs.

Q4. Bellcore GR-2936-CORE proposes that SSPs include the GUBB information within the interoffice signaling message transmitted for call setup. Please provide timing and costs for the inclusion of the GUBB GDP parameter in ISUP signaling.

Thousands-Block Number Pooling

Reference information can be obtained at http:// www.atis.org/atis/clc/inc/incwdocs.htm

- INC 97-1017-019, INC Initial Report to the North American Numbering Council (NANC) on Number Pooling, Version 3, Issued January 1998, Revised June 1998
- AT&T Contribution regarding Thousands Block (NXX-X) Assignment Guidelines, Uploaded 7/14/98
- Draft 7, Thousands Block (NXX-X) Assignment Guidelines, Uploaded 7/8/98
- Proposed Forms for 1000s Block Pooling Assignment Guidelines, Uploaded 7/6/98
  - Months to Exhaust Worksheet
  - 1000s Block Assignment Request, Part 1
  - Pool Administrator's Responsibilities/Confirmation
  - Confirmation of NXX-X Block Activation

Co Chairs: Susan Baldwin and Karen Mulberry

Q1. This alternative proposes that large blocks of sequential numbers ported for pooling purposes be represented in carrier LNP data bases (e.g., SCPs) as single (range) records, rather than individual number records. This capability is generally referred to as Efficient Data Representation (EDR). Please provide timing and costs for equipping LNP data bases with this capability, consistent with the specifications currently under development within the NANC T & O Committee.

Q2. An expressed concern with this alternative is the inappropriate application of Cause Code 26 treatment to calls to numbers that have been ported for pooling purposes, but either disconnected or unassigned. Please provide solutions, costs and timing for eliminating this problem.

Q3. Several enhancements to the NPAC operating software have been identified to better facilitate thousands-block number pooling. Please provide timing and costs for providing such enhancements consistent with specifications under development within the NANC T & O Committee.

NXX Code Sharing

Q1. This alternative requires carrier switches to be capable of screening and routing at the NPA/NXX-X level. Please indicate whether your switches are capable of 7-digit screening today. If this capability must be added, please provide timing and costs for same.

Q2. Seven digit screening (e.g., NPA/NXX-X) may require additional translations tables and processor memory to perform this function. If applicable, please provide timing and costs for same.

10-Digit Dialing

Q1. This alternative suggests that if 10-digit dialing is required on all calls, number administrators could assign 0XX and 1XX codes as working prefixes (i.e., NXXs). Please provide timing and costs for enhancements, if needed, to allow the use of 0 or 1 as the lead digit within an NXX.

NPA Overlays

Q1. Please provide timing and costs for enhancements, if needed, to allow the same NXX from more than one NPA to be assigned to the same switch.

Analysis Task Force

of the North American Numbering Council (NANC) Numbering Resource Optimization (NRO) Working Group

Co Chairs: Susan Baldwin and Karen Mulberry

ITN Pooling

Reference information can be obtained at http://www.atis.org/atis/nanp/nrodocs.htm

- MCI Architecture Plan, 5/30/98
- AT&T ITN Architecture Plan

Q1. This alternative requires the deployment of a Pool Administration System (PAS), with functionality similar to the 800 SMS, which would allow carriers the capability to browse, reserve and port telephone numbers for subsequent assignment to their customers. Please provide timing and costs for the hardware and facilities needed to support a region-wide PAS, capable of storing 50 million telephone number records and handling 12,500 transactions during the average busy hour.

Q2. Please provide timing and costs for the development of operating and maintenance software to support the regional PAS detailed in Question 1.

Q3. Some have suggested that, with certain enhancements, the current NPAC SMS could also function as the regional ITN Pooling PAS. To the extent possible, please provide timing and costs for NPAC enhancements needed to support the functionality detailed in Question 1.

Q4. This alternative may require enhancements to carrier LNP data bases (e.g., SCPs) which would allow the automatic recompiling of (sequential) individual telephone number records with similar data attributes into single (range) records. This capability is sometimes referred to as a dynamic EDR. Please provide timing and costs for adding this capability to carrier LNP data bases.

Q5. One of the alternatives described for ITN pooling suggests the addition of a new network element that would provide vacant number announcements for calls to unassigned numbers within the pooling area. This network element would be assigned a unique LRN value for routing purposes. All LNP query responses with this unique LRN (i.e., all unassigned numbers) would result in the associated call being forwarded to this network element for vacant code treatment. Please provide timing and costs for providing this new network element.

Q6. Please provide timing and costs for the enhancements needed to the NPAC to support the process flows and message sets detailed within the ITN pooling architecture descriptions.

Unassigned Number Porting

Q1. Please provide timing and costs for providing a dynamic range capability to carrier LNP data bases (See Q4 under ITN Pooling).

ATTACHMENT

[Text of Chief, CCB letter to NANC]

March 23, 1998

Chairman Alan C. Hasselwander
North American Numbering Council
4140 Clover Street
Honeoye Falls, NY 14472-9323

Dear Chairman Hasselwander:

Thank you for your letters of November 5, 1997 and December 22, 1997, reporting to the Common Carrier Bureau (Bureau) on the North American Numbering Council's (NANC's) progress in developing a recommendation for the Federal Communications Commission (Commission) on national standards for number pooling. The NANC's recommendation will be an important step in the development of national standards for number pooling that will benefit telecommunications carriers and consumers. The Bureau is looking forward to receiving this recommendation.

In recent months, the Bureau has received inquiries from state public utility commissions and others regarding implementation of number conservation methods that will decrease the frequency of the need for area code relief. In your letters, you state that the NANC has tentatively concluded that the adoption of number pooling is in the public interest and could mitigate the problem of number exhaust. The NANC also has concluded that national guidelines for number pooling architecture, implementation, and administration are appropriate. You also note in your letter that some state public utility commissions have adopted or are considering adopting number pooling requirements and that is the NANC's position that states taking those actions do so at the risk that their decisions may have to be modified to be consistent with national guidelines on number pooling. The Bureau is monitoring these developments and is also aware that some state commissions have established task forces to examine the feasibility and utility of number pooling.

As you know, the NANC plays an important role in facilitating the development of an industry consensus on how number pooling should be implemented and the Bureau fully supports NANC's current efforts in studying pooling and preparing a report for the Commission's consideration. We also believe that efforts by state commissions will provide useful information that should help further the development of this capability. It is our hope that the NANC and the state commissions will work cooperatively on these issues. The NANC is encouraged to respond to state commission requests for information regarding the NANC's

commissions in developing the NANC report. The NANC's report on national number pooling standards will be critical to the implementation of a technology that may alleviate the recurring

Commission six months from the date of this letter. It would be most helpful for the Bureau if the NANC's report could be sufficiently detailed to support, both technically and operationally,

Bureau if the NANC would give number conservation solutions, other than pooling, a very high priority.

issues. Increased availability of numbering resources for all telecommunications carriers will promote competition, and the NANC's endeavors to that end are invaluable.

/s/
A. Richard Metzger, Jr.

Spreadsheet Instructions

R1C6	Code Holder Name
R2C6	Code Holder Telephone Number
R8C2	NPA
R9C2	The name of your company (while this is duplicative, it assists with aggregation)
R10C4	Rate center name
R13C4	This cell should contain the forecasted quantity of thousand blocks for the 3Q98 for all LNP providers for the appropriate rate center listed in row 10. This entry would represent thousand blocks, not individual telephone numbers or whole NXX's. e.g. "3" means you would need 3000 numbers from a pool of thousand number blocks For non-LNP-capable providers this entry represents full NXX codes.
R14C4	Same as above but for 4Q98
R15C4	Same as above but for 1Q99
R16C4	Same as above but for 2Q99
R17C4	Same as above but for 3Q99
R18C4	Same as above but for 4Q99
R20C4	the total number of thousand blocks that will be needed for LNP providers
R21C4	the total number of whole NXX's needed for non-LNP providers

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number conservation solutions, other than pooling, a very high priority.

Thank you, as always, for your continued efforts on these complex and important issues. Increased availability of numbering resources for all telecommunications carriers will promote competition, and the NANC's endeavors to that end are invaluable.

Sincerely,

A. Richard Metzger, Jr.
Chief, Common Carrier Bureau

PUBLIC NOTICE

FEDERAL COMMUNICATIONS COMMISSION
1919 M STREET, N.W.
WASHINGTON, D.C. 20554

News Media Information (202) 418-0500. Fax on Demand 202/418-2830
Internet: http:/www.fcc.gov FTP site: ftp.fcc.gov

DA 98-597

Released: March 27, 1998

CHAIRMAN ALAN C. HASSELWANDER, NORTH AMERICAN NUMBERING COUNCIL ANNOUNCES NUMBERING RESOURCE OPTIMIZATION WORKING GROUP FORMATION, ORGANIZATIONAL MEETING AND AGENDA

(CC Docket No. 92-237)

On March 24, 1998, in response to a letter from the Chief, Common Carrier Bureau of March 23, 1998, the North American Numbering Council (NANC) created a new working group to address issues of number availability and conservation. The Common Carrier Bureau has requested that NANC report to it on national number pooling standards no later than September 23, 1998, and that the report be sufficiently detailed to support, both technically and operationally, a uniform, nationwide system for pooling by December 1999.

Additionally, the Bureau urged the NANC to work cooperatively with state commissions on these issues and further requested that the NANC give number conservation solutions, other than pooling, a high priority. A copy of the Bureau's letter is attached to this notice.

The Numbering Resource Optimization Working Group (NRO-WG) will hold its organizational meeting on April 16, 1998, from 8:30 a.m. until 4:00 p.m., at the Federal Communications Commission, 1919 M Street, NW, Room 856, Washington, DC. The NANC seeks to have broad representation on the new working group, including participants from NANC, NANPA, NARUC, state interests, consumers, equipment manufacturers (both hardware and software), all telecommunications industry segments, and international interests. Selected participants may be required to attend more than one meeting per month.

Parties interested in participating on the NRO-WG should contact Chairman Alan C. Hasselwander via email at ahasselw@frontiernet.net and provide a brief description of their background and interest group they represent **no later than April 9, 1998.**

Organizational Meeting Agenda

1. Introductions. North American Numbering Council Chairman, Alan C.

Hasselwander; Interim Co-chairs (NANC members), Mike Bennett, SBC; Woody Kerkeslager, AT&T, and Beth O'Donnell, NCTA.

2. Discussion of group mission and practices.

3. Identification of key issues relevant to number pooling and other number conservation methods. Further identification of current state projects relevant to number conservation.

4. Set up Task Groups and define their relationship to NANC, INC and other industry fora. Select co-chairs.

5. Define work plan for developing NANC report to FCC on national number pooling standards.

6. Schedule of future NRO-WG meetings.

7. Nomination of permanent co-chairs for NRO-WG for confirmation by NANC at April 21, 1998 meeting.

8. Other business.

FOR FURTHER INFORMATION CONTACT: Jeannie Grimes at (202) 418-2313 or via the Internet at jgrimes@fcc.gov. The address is: Network Services Division, Common Carrier Bureau, Federal Communications Commission, 2000 M Street, NW, Suite 235, Washington, D.C. 20554. The fax number is: (202) 418-7314. The TTY number is: (202) 418-0484.

-FCC-

[Text of Chief, CCB letter to NANC]

March 23, 1998

Chairman Alan C. Hasselwander
North American Numbering Council
4140 Clover Street
Honeoye Falls, NY 14472-9323

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In recent months, the Bureau has received inquiries from state public utility commissions and others regarding implementation of number conservation methods that will decrease the frequency of the need for area code relief. In your letters, you state that the NANC has tentatively concluded that the adoption of number pooling is in the public interest and could mitigate the problem of number exhaust. The NANC also has concluded that national guidelines for number pooling architecture, implementation, and administration are appropriate. You also note in your letter that some state public utility commissions have adopted or are considering adopting number pooling requirements and that is the NANC's position that states taking those actions do so at the risk that their decisions may have to be modified to be consistent with national guidelines on number pooling. The Bureau is monitoring these developments and is also aware that some state commissions have established task forces to examine the feasibility and utility of number pooling.

As you know, the NANC plays an important role in facilitating the development of an industry consensus on how number pooling should be implemented and the Bureau fully supports NANC's current efforts in studying pooling and preparing a report for the Commission's consideration. We also believe that efforts by state commissions will provide useful information that should help further the development of this capability. It is our hope that the NANC and the state commissions will work cooperatively on these issues. The NANC is encouraged to respond to state commission requests for information regarding the NANC's work in studying pooling, and, where possible, to use information obtained from state commissions in developing the NANC report. The

NANC's report on national number pooling standards will be critical to the implementation of a technology that may alleviate the recurring problem of area code exhaust. For this reason, we request that NANC submit its report to the Commission six months from the date of this letter. It would be most helpful for the Bureau if the NANC's report could be sufficiently detailed to support, both technically and operationally, a uniform, nationwide system for pooling by December, 1999. It would also be helpful to the Bureau if the NANC would give number conservation solutions, other than pooling, a very high priority.

Thank you, as always, for your continued efforts on these complex and important issues. Increased availability of numbering resources for all telecommunications carriers will promote competition, and the NANC's endeavors to that end are invaluable.

Sincerely,

/s/
A. Richard Metzger, Jr.
Chief, Common Carrier Bureau

MINORITY STATEMENT

INTRODUCTION

This Minority Statement is submitted and supported by the companies identified on the last page of this document who will be referred herein as the "Minority Parties". The Minority Parties also contributed to the process and information which led to the submission of the Majority Statement, entitled the NRO Report. However, it is the opinion of the Minority Parties that the result of the process has not resulted in an entirely credible document. Further, the document, although perhaps minimally meeting the terms of the FCC's assignment does not do so in a manner which provides a road map to the expeditious implementation of solutions to the NPA relief problems that threaten the success of the competitive local exchange service market. Rather, it continues the stranglehold that the incumbent local exchange companies have on the publicly owned resource most essential to competition, telephone numbers, and does so for a period long enough (4 to 6 years) to curtail if not eliminate competition. We therefore cannot support the Majority Statement with respect to the issues identified below and are providing our views through this submission.

In order to best serve the reader this document approximately follows the issue flow in the Majority Statement so that ready contrasts of the positions can be easily made.

THE MINORITY PARTIES SUPPORT THE FCC'S INTENTION BUT DO NOT SUPPORT ASPECTS OF THE NRO REPORT.

A. The 1000 Number Block NRO Recommendations are Wrong in Five Major Ways

The Minority Parties wholeheartedly supports the FCC's goal of implementing telephone number pooling as one contribution to the optimal use of the North American Numbering Plan (NANP) and to the enhancement of competitively neutral telephone number administration. Unfortunately, the recommendations developed under the Numbering Resource Optimization Working Group ("NRO") for 1000 block pooling fall far short of its potential to; maximize efficient and competitively neutral allocation of telephone numbers, to support increased consumer choice of numbers, and to reduce the accelerating pressures on state public service commissions for Number Plan Area (NPA) relief.

As framed by the NRO, 1000 block number pooling is "too little - too late" to have any appreciable impact on near to intermediate term number resource exhaust and will have a discriminatory, and thus anti-competitive, effect on competitive LECs (CLECs). For these reasons, as detailed below, the Minority Parties believed it necessary to withhold support from the 1000 block pooling section of the NRO's report to NANC. In addition, other pooling or “pooling like” solutions have not been adequately addressed by the NRO report and will be addressed in this document.

If implemented in an optimal fashion, 1000 block pooling could result in a marked improvement in number utilization efficiency and in competitive access to the entire number resource the huge quantity currently warehoused by the incumbents and those new and minimal resources currently being made available. Instead, the recommendations for 1000 block pooling developed for the NRO report would create a competitively biased number aggregation and allocation system and would undermine the effectiveness of 1000 block pooling as a means of improving number utilization. The issues are:

1. "Contamination" Levels

The ten percent contamination level (the percent of an NXX above which 1000 number blocks escape pooling) accepted by NRO mean that the carriers holding most of the current inventory of 1000 block assignments, namely incumbent LECs (ILECs), will not be required to contribute any significant proportion of their unused and warehoused numbers to the industry pool. By setting block contamination at 10%, the NRO recommendation will significantly limit the total ILEC contribution to the pool, thus reducing the overall effectiveness of pooling on NPA exhaust. This will result in a disproportionate contribution of CLEC inventories to the block pool, and virtually eliminate the potential offered by pooling to provide improved competitive access to the embedded base of unassigned numbers in any NPA and rate area. The contamination level should be set at 50% as a minimum and perhaps higher in some localities depending on the present and forecast number requirement growth rates.

2. Inventory Size

The service provider and industry inventories recommended by the, NRO report are so large - indeed, greater than presently in use in the industry - that they contradict the objective of reducing the current inefficiency of assigning full NXX (10,000 number) blocks to specific carriers. The recommendation for 18 months of inventory (9 month carrier inventories plus an additional 9 month pool inventory), applicable to each switch in each rate area, will reduce potential number optimization benefits by pre-maturely draining the NPA resource and increasing the potential for permanently stranded resources in carrier inventories. In addition, these large inventories will reduce competitive access to available numbers by protecting more numbers than necessary for individual carriers, rather than leaving them available to all carriers via their access to the industry pool.

3. Block Assignment

The intention of number resource optimization is to be able to allocate numbers where they are needed and can be used efficiently and effectively. Currently, because of billing considerations, that allocation should be at the rate center and proper management of the number resource requires matching allocations to the growth requirement for numbers on a rate center by rate center basis irrespective of the number of ILEC and CLEC switches in those rate centers. When managed optimally the need for telephone numbers is determined by the requirement for new dial tone lines, not by the number of switches being installed.

The NRO report, by assigning 1000 number blocks to each carrier's switch rather than to the rate centers, could and very likely will, unnecessarily deplete 1000 number block resources. The assumption that 1000 number blocks will be assigned to carriers on a per-switch basis, rather than on a per rate area basis, ignores the ability of carriers to share these blocks among multiple switches within a rate area using LNP.

The failure to consider this fundamental aspect of effective telephone number utilization competitively advantages carriers who have the largest number of switches in each rate area because they will obtain more numbers in totality. This is primarily true of course for the ILECs, with their multiple switches per rate area, and it may significantly increase the number of blocks required by all carriers for a given rate area. This NRO recommendation can easily lead to even greater sub-optimal use of numbering resources than exists now.

4. Exemptions for Some ILEC Switching Systems

The blanket exemption from pooling for certain switch types will dramatically reduce ILEC participation in pooling, especially where some of the most commonly used electronic switches (e.g. ,5ESS and DMS 100) may qualify for exemption. If there are valid technical constraints for some switches, the question of whether or not such constraints justify a more extended schedule for pooling implementation, let alone the broader relief of a complete exemption or waiver, is a policy question appropriately decided by the FCC.

5. The Schedules are Exaggerated

The schedules presented in the report which defer pooling as a real solution for four to six years are simply not realistic. They do not solve the problem presented by the FCC but merely defer the solution. Rather than to adopt a reasonable time-table for pooling implementation and finding a solution that fits into it, the NRO Report postulates a solution that appears to have maximized cost, complexity, and time to implementation.

B. THE NRO REPORT RECOMMENDATIONS DELAY THE INEVITABLE

The NRO Report does not emphasize and support pooling and “pooling like” solutions that can be quickly implemented and that will bring badly needed relief quickly, such as the porting of unassigned numbers and rate center consolidation. The Minority Parties believe that greater emphasis should be put on these solutions. If it is not done by the FCC it will be done by the states because they have no choice and they are on the front line in combating the number use optimization problem.

THE POSITION OF THE MINORITY PARTIES

As emphasized above the Minority Parties enthusiastically and fully support the FCC's goal of implementing telephone number pooling as one of the means to optimize efficient use of the North American Numbering Plan (NANP) and enhance competitively neutral administration. Although recognizing that 1000 number block pooling, when properly designed and implemented unlike the NRP Report recommendation, is one potential pooling solution it is clear that Individual telephone number (ITN) pooling clearly represents the best potential method for improving number utilization. ITN pooling will also optimally relieve NPA exhaust and allow competitive parity in access to numbering resources. If implemented correctly, ITN pooling would result in a maximization of administration efficiency within a rate area and allow completely neutral access to the entire number resource. Comments on ITN and other Minority Party recommendations follow.

1. Number Optimization Benefits of ITN Pooling

It is extremely disappointing that the NRO was, in their report, reluctant to reflect the full benefits of ITN pooling in improved number utilization, competitively neutral access to the number resources, and consumer choice of numbers. While the exact benefits of either ITN or 1000 number block pooling cannot be quantified, and no quantification is attempted by NRO, it is both an obvious and logical conclusion that administering numbers on an individual basis would provide substantial improvements over administration in larger number blocks. ITN pooling also increases the ability of the NANPA to accurately forecast depletion and exhaustion of available numbers in NPAs. Under ITN pooling, number administrators can maintain current, accurate data on actual number utilization instead of relying on carrier reports and estimates which may count every newly required line once for each carrier intending to market to the

consumer needing that line. This improved accuracy will increase the reliability of area code projections and further reduce the costs, organizational burdens and public confusion associated with NPA relief.

2. Realistically Extended Implementation Schedules are Required

The 4-6 year time frame projected for ITN implementation by the NRO Report is grossly exaggerated. Force fitting the ITN solution into that time frame will significantly delay the date by which number administration would become competitively neutral. No other industry effort of comparable magnitude (LNP, 800 portability and equal access as but a few examples) has required such a lengthy interval. MCI, one of the Minority Parties, has determined through an internal assessment, that with a firm regulatory deadline and resource prioritization, ITN pooling could be accomplished in as little as 3 years and perhaps less. Indeed, as ITN pooling would be built on the existing LNP databases and resources, its implementation will likely prove far simpler than prior industry changes that required the development and deployment of new, interconnected database systems.

3. Inventory Levels

Modest inventory levels may be acceptable for reasons of carrier and customer convenience, but because the promise of ITN is near real-time access to any number, by any customer and carrier, inventories must be held to an absolute minimum in order to realize the full potential benefits of ITN. Further, inventory sizes should be based on forecasts done by NANPA wherein the counting of every potential new customer by each carrier's forecast is minimized. The NRO Report does not adequately address this issue of exaggerated forecasts.

4. The Porting of Unassigned Numbers

The porting of unassigned numbers from the existing warehouse of numbers in rate centers will contribute immediate savings of the assignment of thousands of 10,000 number NXX blocks and provide immediate relief to NPA exhaust situations. This implementation can take place in a matter of months and will bring the immediate benefits of number utilization optimization required while the debate over other relief mechanisms rages on.

5. Rate Center Consolidation - A “Pooling Like” Solution

Many states have implemented Rate Center Consolidation to provide relief to NPA exhaust. When rate center areas are consolidated all of the NXX codes previously designated to each rate center are now “pooled” and the telephone numbers from this pool serve the single rate center area which results from the consolidation.

Many of the problems associated with the initial consolidations efforts, such as maintaining the integrity of the 911 and E911 systems have now been solved. At this time a national policy is required which will mandate Rate Center Consolidation as a required NPA relief mechanism when it is possible to do so. The policy should provide for a “statement of proof” for situations wherein it is claimed consolidation is not feasible.

CONCLUSION AND RECOMMENDATIONS

The Minority Parties recognize that ITN pooling may appear aggressive to some dominant firms in the industry, and that regulators may fear that ITN pooling is too "radical" a change in the manner of telephone number administration. These

concerns can be addressed directly, because carriers and policy makers must understand that efficient number utilization and competitively equal access to numbering resources cannot be achieved with incremental "tweaks" to current industry practices. Number assignment and utilization, as developed in the local exchange industry over several decades, was not based on a competitive industry model. It was and is based on a monopoly model which when applied to more than one carrier in an area incurs tremendous waste of finite numbering resources. The monopoly model does not fit nor will it adequately support the competitive industry.

Unless and until industry state and federal policy makers are willing to take a radically new approach and implement a major overhaul of number administration and utilization, the tremendous costs of relief for repetitive NPA exhaust situations will continue to be imposed on all telecommunications carriers and consumers in the United States and throughout North America. The way to accomplish this critically needed transition from the monopoly model to the competitive model is by an immediate start of development of an ITN pooling solution. Delaying such fundamental change with other, less effective approaches to number pooling will merely prolong the status quo.

In conjunction with complementary long-term measures such as rate center consolidation and independent and more accurate forecasting, ITN pooling can serve as a key element, perhaps the most important, in conservation of numbering resources and the promotion of truly competitive telecommunications markets. The Minority Parties urge the FCC to step forward and establish a three step process for the development and implementation of ITN pooling. First the process should use as a starting point the immediate implementation of a national requirement for the porting of unassigned numbers within existing rate centers. Second, the FCC should require Rate Center Consolidation wherever and whenever code relief is required and it is possible to do so. A “statement of

proof" from the incumbent carrier should be required if it is claimed that rate center consolidation is not practical or feasible. Third, the development of a system for ITN pooling and pool administration should be started immediately. The development should be conducted with NANPA oversight and industry participation.

National Association of State Utility Consumer Advocates Separate Opinion
Concerning Number Resource Optimization - Working Group
September Report

The National Association of State Utility Consumer Advocates ("NASUCA") has participated in the work of the Number Resource Optimization - Working Group ("NRO-WG") since its beginning early this year. The September Report reviews the use of Thousands Block and Individual Telephone Number Pooling. The NRO-WG September Report represents a positive step forward. However, it is disappointing to the extent that it fails to propose national number pooling solutions that would be available in the near future. As a result, NASUCA files this Separate Opinion.

NASUCA members have been forced to deal with a proliferation of area code changes in recent years. In many states, area codes that have been in existence for decades have been replaced in the last few years - in some locations one or more times. The real problem is that telephone numbers are given out in 10,000 number NPA-NXX blocks even when only a few numbers are used.

Much of the need for these area code changes was accelerated by the passage of the Telecommunications Act of 1996 in February 1996. That Act permits many Local Exchange Carriers to compete in, and take NPA-NXX codes in, the same rate areas. In this manner, the area code problem has been growing and evident for more than two years.

Many consumers have expressed their outrage that area codes have proliferated with little apparent management or control. Even when few telephone numbers are actually being used by Local Exchange Carriers, more telephone numbers and area codes have been added with little apparent foresight or control. The costs to consumers of area code changes, e.g. changing their area code or going to 10 digit dialing, have been immense. This has lead to the current area code crisis and the attempt by the NRO-WG to take action to bring this crisis under control.

Given the serious area code problems that exist, the Report is disappointing to the extent that it offers little in the way of national pooling solutions in the near future. Thousands Block Pooling is already being implemented in the Chicago 847 area code at the present time. However, the Report proposes that Thousands Block Pooling will not be implemented on a national basis until Fourth Quarter, 1999 to Second Quarter, 2000. Individual Telephone Number Pooling will not be implemented for another four to six years or until 2002 or 2004. Pushing national number pooling solutions off into the future would not effectively deal with the current crisis. NASUCA submits that the industry must deal with these problems in a more expeditious manner and encourages the industry to complete national pooling solutions as soon as possible.