CC Docket 92-237

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Federal Communications Commission
Office of Secretary

4140 Clover Street
Honeoye Falls, New York 14472-9323

May 12, 1999

Lawrence E. Strickling
Chief, Common Carrier Bureau
Federal Communications Commission
The Portals
445 Twelfth Street, SW
Washington, D.C. 20554

Dear Mr. Strickling:

Attached for your information and use are the following documents:

- North American Numbering Plan Exhaust Study Submitted by: North American Numbering Plan Administration (NANPA) Lockheed Martin CIS April 22, 1999.
- Report of the NANP Exhaust Review Team May 3, 1999.
- Comments by the National Association of Regulatory Utility Commissions to the North American Numbering Council Regarding the Forecasted Exhaust of the North American Numbering Plan April 23, 1999.
- April 22, 1999 Letter from Michael F. Altschul Re: North American Numbering Plan Administrator ("NANPA") Report on NANP Exhaust and the Impact of Thousand Block Number Pooling.

Sincerely,

Alan C. Hasselwander
Chairman, North American Numbering Council

cc: Yog R. Varma, Anna Gomez, Diane Harmon, Jared Carlson, Jeannie Grimes

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REPORT OF THE NANP EXHAUST REVIEW TEAM

May 3, 1999

Introduction

At the February 1999 NANC meeting, a NANP Exhaust Review Team (Team) was created to review the underlying assumptions and conclusions of the NANP Exhaust Model created by NANPA. This report provides the conclusions reached by the Team and updates the February findings.

NANP Exhaust Model Overview

The NANP Exhaust Model created by NANPA actually consists of three models. The models include the NPA Demand Model (top-down), the CO Code Demand Model (bottom-up), and the Pooling Model. The NPA Demand Model and CO Code Demand Model are stand-alone models that estimate NANP exhaust using two different methods. The Pooling Model assesses the impact of Pooling. The NANC directed the Team to limit its review to the contents of the NANPA Models only. No conservation measures other than pooling were modeled. A description of the models is included as an attachment to this report.

NPA Demand Model

Using the NPA Demand Model, NANPA estimates that the NANP is likely to exhaust between 2006 and 2012.

The NPA Demand Model uses recent NPA demand and estimated near term demand for 1999 and 2000 to project future NPA demand. It applies a constant growth rate each year to the number of US Geographic NPAs for 2001 and beyond. Specifically the growth rates considered were 7% (for an exhaust date of 2012) and 15% (for an exhaust date of 2006). It also assumes that there will be two NPAs per year required for non-US Geographic purposes (international or service NPAs). The model uses recent historical data because there has been an increase in demand since 1995. NANPA's model assumes that a growth rate similar to that exhibited since 1995 (i.e. 7%-15%) will continue.

Although the Review Team did not agree with NANPA's estimate of future NPA demand, they did agree that projecting demand depends upon many things but there is a single critical element, i.e., whether recent NPA demand is an aberration or whether it represents a trend that is likely to continue.

CO Code Demand Model

Using the CO Code Demand Model, NANPA estimates NANP exhaust between 2005 and 2012. Using the same model but revising the assumptions to reflect the input of the Team, NANP exhaust is estimated at 2016. (This date compares to a 2008 date using NANPA's assumptions.)

The CO Code Demand Model consists of two separate modules. The first module estimates yearly CO code demand. The second module uses the results from the first module and estimates yearly NPA demand. The first module is called the CO Code Demand Module the second module is called the NANP Exhaust Module.

The industry review team disagrees with many of the assumptions used by NANPA in its bottom up NANP Exhaust projection. However when all changes recommended by industry are reflected in the NANPA Model, with the exception of two factors driving new providers' NXX demand, the estimated NANP exhaust date shifts only about two years, to 2010 versus NANPA's 2008 estimate. When industry concerns about the assumptions used to drive new providers' NXX demand also are included, the NANP exhaust date estimate moves to 2016. A further refinement (capping the quantity of new "equivalent CLECs" at 20 in 2005) indicates a NANP exhaust of 2023.

The CO Code Demand Module was specifically developed to quantify the impact of new service providers on CO code demand. The exhaust date is sensitive to the assumptions within the model regarding new service providers' demand for CO codes. NANPA and the Team could not agree on these assumptions. It should also be noted that determining the number of new service providers is also the most difficult assumption to predict.

Pooling Model

NANPA's estimate of the impact of thousands block pooling on the NANP exhaust date is summarized in the table below.

Participation[1]	Year Pooling Begins[2]	1KB Donation[3] (Y/N)	NANP Exhaust Date
All Segments	2000	N	2058
All Segments	2000	Y	2094
ILEC, CLEC, CMRS	2000	Y	2048

The Review Team was unable to reach consensus with regard to estimating a NANP exhaust date using the Pooling Model. This was due primarily to a concern that the model assumed the implementation of pooling in all NPAs at the same time. In addition these assumptions do not address technical feasibility and availability. The Team did however agree that the effect of pooling would be to extend the life of the NANP, perhaps as far as mid-21st century.

The Pooling Model was developed to estimate pooling's impact on NANP exhaust. Impacts of pooling on a specific NPA will vary depending on the characteristics of the NPA. The Pooling Model applies assumptions to the yearly CO code demand from the CO Code Demand Module to generate a new yearly CO code demand in a pooling environment. The new yearly CO code demand is applied to the NANP Exhaust Module to estimate NANP exhaust. The model assumes that all NPAs implement pooling in the same year. It is interesting to note that even under this model a substantial amount of TNs are spare when the NANP exhausts.

[1] All Segments means all ILEC, CLEC, CMRS and Paging service providers. The All Segments assumption covers all service providers who currently obtain NANP CO code resources.
[2] Year 2000 was selected for the Year Pooling Begins simply to show the impact of 1000s block pooling on the year of NANP Exhaust. This is not to imply that pooling will actually be implemented in the segments noted in the year noted.
[3] 1KB Donation refers to a practice wherein service providers donate 1000s blocks, with low or no contamination rates, towards the creation of a 1000s block pool.

Next Steps

NANPA should evaluate the 1999 COCUS data and provide information on CO code and numbering usage assignment trends based on current activity.

ALTERNATIVE SCENARIO DESCRIPTION

(BASED ON REVISED ASSUMPTION BY THE REVIEW TEAM)

Industry members of the NANP Exhaust Review Team revised NANPA's base assumptions to create an alternative scenario. The following revised assumptions projects a NANP exhaust date of 2016 versus 2008 using NANPA's assumptions. The revised assumptions include the following:

1. Continue Working Telephone Number (WTN) growth rates for each industry segment to a minimum of 3% per year rather than the lower levels in the NANPA model. The Team concluded that long-term growth utilization would continue at historical levels.
2. Use an equivalent service provider rate center starting point as follows:
   - CMRS at 2000 rate centers per mature equivalent service provider instead of NANPA's estimate of 2749.
   - CLEC at 2632 rate centers per equivalent service provider instead of NANPA's estimate of 4386.

   The Team believed the NANPA methodology of defining a mature equivalent carrier, by counting every rate center where at least one carrier had an existing NXX was an overstatement. The Team developed an estimate of the number of rate centers with at least two CLECs.
3. Buildout Commercial Mobile Radio Services (CMRS) to a maximum of six equivalent Personal Communications Service (PCS) providers. NANPA had estimated seven equivalent PCS carriers by 2003, growing to twelve by 2018. There are four reasons for this change:
   - The FCC has announced no plans to auction additional spectrum to justify increasing the number of equivalent CMRS PCS carriers beyond the six licensees.
   - In many markets one PCS carrier has more than one license, making even a limit of six conservative.
   - The FCC is considering raising or removing current spectrum cap limits which could facilitate additional industry consolidation.
   - The FCC's recent reauction of C, D, E and F licenses concluded with over 30 licenses that did not receive even a minimum bid.
4. Mature CMRS service providers expand their footprint at 0.5% per year rather than NANPA's estimate of 2.0% per year. Providing sufficient wireless coverage to serve rural areas with a

commercially-acceptable level of service is an expensive endeavor, particularly with established competitors already holding 100% of the potential market share. Unlike wireline service, where customers can be served via unbundled network elements and co-located facilities while market share develops, wireless carriers must build a fairly robust, entire network before even one customer is able to receive service. Despite this, the NANPA perceives an unbridled, uneconomic expansion, of even mature carriers, into rate centers that cannot support more than one or two competitors.

5. Mature Paging service providers expand their footprint at 0.5% per year rather than NANPA's estimate of 2.0% per year for the same reasons identified in 4, above.

No industry segments (CMRS, Paging, CLEC, or Incumbent Local Exchange Carrier) use the CO Code Demand Model's incremental CO code per NPA per switch/node assumption. The Team concluded that since the Model already provided carriers with new codes as new rate centers are entered that this assumption would add an invalid additional demand for codes. Even ILECs typically populate new switches with existing NXX codes.

COMMENTS BY
THE NATIONAL ASSOCIATION OF REGULATORY UTILITY COMMISSIONS
TO THE NORTH AMERICAN NUMBERING COUNCIL
REGARDING THE FORECASTED EXHAUST OF
THE NORTH AMERICAN NUMBERING PLAN
April 23, 1999

The North American Numbering Plan Administrator (NANPA) has submitted details regarding the projected exhaust of the North American Numbering Plan (NANP) to the North American Numbering Council (NANC). NANC Representatives of the National Association of Regulatory Utility Commissions (NARUC) respectfully submit the following comments to the forecast by NANPA. NARUC has been involved as a member of the review team designated by NANC to study the various models and estimates performed by NANPA to project the exhaust date of NANP. We believe that the results of this effort are of major importance to our constituents and, therefore, urge NANC and the Federal Communications Commission (FCC) to accept these comments in your consideration of these issues.

NARUC asks the NANC to consider the following items in its consideration of the NANPA forecast:

- The forecasts developed by NANPA using its models are highly complex and contain many assumptions;
- Many of the NANPA model details and underlying assumptions remain subject to controversy;
- NARUC forecasts using simple regression analysis on historical area code demand produces results consistent with NANPA baseline forecasts;
- NANPA forecasts are not driven by demand for telephone numbers but by demand for central office codes for other purposes; and
- The total NANP resource theoretically provides for sufficient telephone numbers to satisfy the needs in North America far beyond the forecasts presented by NANPA.

Because of NARUC's belief in these statements, we conclude the following:

- Results of the NANP forecasting model highlight the inefficient use of NANP resources under current utilization methods;
- Assuming the NANP resource continues to be used in the same inefficient manner as has been exhibited during the past five years, NARUC generally agrees with the results provided by the NANPA forecast;
- Because NARUC's independent evaluation of the growth in area codes provides results consistent with NANPA baseline forecasts, NARUC takes no position regarding the controversies surrounding the NANPA model and accepts the results for planning purposes, assuming no change in the inefficient use of the NANP resource;
- NARUC requests that the NANPA model be updated and verified periodically as actual results are available; and
- Most importantly, the NANC and the FCC should perform an immediate high level analysis of the cost trade-off between NANP expansion resulting from continued inefficient resource utilization and system infrastructure changes necessary to remove the inefficiencies. This study should be used for comparative purposes only. NARUC believes that the societal and industry costs for NANP expansion are currently underestimated.

Background

In February 1999, NANPA provided information to NANC that indicates an exhaust of NANP on or about the year 2007. NANPA presented some of the details of its projections during the February NANC meeting. NANC members expressed concern about the results of the forecast and also questioned some of the underlying assumptions. NANC decided to provide an opportunity for all interested parties to study the NANPA model and its assumptions by assembling a study team. As NARUC understands the directions from NANC, this study team was to meet over a period of the subsequent two months and to provide a report back to NANC at its April meeting. NANC directed the study team to reach as much understanding of the NANPA model while also attempting to reach as much consensus as possible. Study team meetings were held on March 9-10, March 30-April 1, and April 14-16. NARUC representatives participated in all meetings.

The meetings of the study team concentrated on NANPA explanations of all model assumptions and methods. Team members were provided working copies of all models and written explanations of methodology and assumptions. The participants provided discussion, input, and criticism of the model, its assumptions, and the results.

Discussion

In its preparation for examining the NANPA forecast, NARUC studied the historical area code demand and basic telephone number demand criteria. Our preliminary analysis resulted in a real concern about the results of the NANPA model for two basic reasons: (1) inefficient allocation of central office codes and (2) unrealistic projections of consumer demand for telephone numbers.

NARUC is concerned that the recent acceleration in demand for area codes (driven primarily by demand for central office codes) is due to inefficient allocation of central office codes and not due to demand for telephone numbers. Competitive Local Exchange Carriers (CLECs) are currently required to obtain an entire central office code (*i.e.*, ten thousand telephone numbers) for each and every rate center in which they offer service. Additionally, in order to provide its customers with local calling to and from wireline subscribers, wireless carriers similarly are required to obtain central office codes for each and every rate center in each local calling area (if they desire to have local access for their customers from wireline providers). Neither of these significant drains on central office codes is driven primarily by demand for telephone numbers. In fact, many, if not most, of the recent area code relief situations are in fact caused primarily by such inefficient demand for central office codes.

Data provided by NANPA demonstrates that the historical trend of area code demand follows two distinct growth rates. From 1947 through approximately 1994, the trend is fairly consistent at a linear growth rate of slightly greater than one area code per year. Since 1994, the trend has increased significantly to over 27 area codes per year. If this trend continues, a simple projection using regression analysis demonstrates a total NANP exhaust somewhere between 2004 and 2011, depending upon the type of growth curve selected. These projections, although less elegant than the complex models produced by NANPA, confirm the general conclusions of the NANPA baseline forecast model.

Why is this trend of concern to NARUC? State commissions are being asked repeatedly to disrupt consumers in their states with yet more area code relief situations. Since the FCC, under its statutory authority, has delegated area code relief decisions to the States, the results of this difficult decision are often blamed on the States. Recent reports by NANPA demonstrate that States are attempting various strategies to take numbering matters into their own hands. Examples include mandatory number pooling, waiver requests to the FCC for service-specific overlays, and modified rationing plans. NARUC views each of these as attempts to forestall an area code relief situation when the State does not believe it is truly necessary.

NARUC is concerned that simply accepting or arguing about the forecast prepared by NANPA is to ignore the problem. As we have already stated, we agree that the NANPA forecast likely predicts the fate of the NANP if current trends continue and nothing is done to correct the problems. Although stopgap measures, such as number pooling or rate center consolidation, might slow the process to some extent, they do not completely solve the real problem. To solve the real problem, a major shift in the way telephone numbers are deployed needs to be examined. A major source of the problem lies in the constraints caused by the current rate areas or rate centers. Currently, all number allocation and recommended efficiency solutions remain limited to existing rate centers. Because of the extended time frames and possible high level of expense for such changes, planning should begin immediately to develop solutions to this constraint.

NARUC's second concern is related to a basic reality check of the consumer demand for telephone numbers. Absent inefficiencies in the allocation of telephone numbers, the current NANP has an enormous storehouse of numbers. In fact, the current NANP theoretically has almost 5.4 billion telephone numbers available. That number amounts to approximately 46 telephone numbers per household in the U.S. and Canada or 23 telephone numbers for every person over the age of 15. However, it is obvious that we have not been able to manage the pool of telephone numbers in an efficient manner. But if we even assume a very poor utilization rate of 25%, it still allows 11.5 telephone numbers per household or 6 telephone numbers for every person over the age of 15. We find it illuminating to examine the data in this manner because it provides a conclusion that is clear. The NANP exhaust forecast is not driven by demand for telephone numbers, but by inefficiencies in the current allocation of resources.

NARUC has not performed any specific cost analyses on NANP exhaust; however, we believe there is enough evidence to conclude that expansion of the NANP to allow for additional digits (*e.g.*, from 10 digits to 12 digits within the North America Numbering Plan Area)[1] will burden society with extremely high costs and inconveniences. Some have anecdotally predicted that NANP expansion will be more costly and disruptive than Y2K. Based on our knowledge of computer systems, it is apparent that the expansion of the telephone number field will affect a majority of major computer systems in this country. On the other hand, there is also resistance by many in industry to the alternative, *i.e.*, making changes to all the systems (hardware, software, etc.) in order to accommodate more efficient use of the resource. There is likely a significant cost associated with making these changes as well. NARUC recommends that a high level industry cost analysis be performed without delay that will determine the ultimate effects of either decision. After such an analysis is performed, then the FCC should be in a position to make a determination in which direction the industry should progress.

NARUC respectfully requests the NANC to consider these comments in conjunction with the projected report prepared by the NANPA.

Vince Majkowski
for NARUC

[1] The NANP exhaust industry forum has proposed the expansion of the current NANP to include 12 digits for domestic calls. This would include an expansion of the current NPA from 3 digits to four digits and the telephone number from 7 digits to 8 digits.

April 22, 1999

Alan Hasselwander
Chairman
North American Numbering Council
P.O. Box 39396
Rochester, NY 14604

Re: North American Numbering Plan Administrator ("NANPA") Report on NANP Exhaust and the Impact of Thousand Block Number Pooling

Dear Chairman Hasselwander:

Representatives from the Cellular Telecommunications Industry Association ("CTIA"), GTE, AT&T, Bell Atlantic, Bell South, MCI, Omnipoint, the Personal Communications Industry Association ("PCIA"), Nextel, SBC, the United States Telephone Association ("USTA"), and from the FCC and state commissions (collectively, the "Review Team") have spent the past month reviewing a report authored by Lockheed Martin, the NANPA, regarding the forecast exhaust of the NANP and the impact of thousand block number pooling. The NANC asked the Review Team to review the models and underlying assumptions contained in this report. The NANC also asked Lockheed Martin and the Review Team to generate a report highlighting areas of "comfort" or consensus.

Today, Lockheed Martin formally submitted its report to the NANC. During the past month, the undersigned Review Team members, with the assistance of Lockheed Martin, have obtained a much better understanding of the Lockheed Martin exhaust model. Unfortunately, in our opinion, the report submitted by Lockheed Martin today does not adequately capture the sensitivity of the model to certain key assumptions and the range of the Review Committee's concerns. [1] In particular, the most sensitive variables in the model are among the most unpredictable, *i.e.* the number of new competitors and their presence in rate centers in the future. While the industry has not reached consensus on specific values for each of these variables, the Review Committee

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[1] Lockheed forecasts exhaust between 2006 and 2011 using the NPA Demand Model and between 2005 and 2012 using the CO Code Demand Model. The industry assumptions move the exhaust forecast back at least ten years.

did develop a range of values for each of these key variables. Attached to this letter is a summary describing the key assumptions that drive the Lockheed Martin study, and how the industry view differs from the assumptions advanced by Lockheed Martin.

One final point needs to be made. Because the original Lockheed Martin report and code exhaust model focused exclusively on 1000 block pooling as the sole conservation methodology, the impact of the other conservation approaches identified in the NRO report were not considered by the Review Team. These additional conservation approaches may permit further extension of the NANP exhaust date in conjunction with, or as an alternative to, 1000 block pooling.

Sincerely,

Michael F. Altschul
Vice President & General Counsel
Cellular Telecommunications
Industry Association

On behalf of:

Bell Atlantic
SBC
GTE
Nextel

REVIEW OF THE NANPA REPORT

These are the key assumptions which significantly affect the projected dates for NANP exhaust and the impact of thousand block number pooling.

- The number of Service Providers

  CMRS:

  NANPA assumed the entry of as many as 14 CMRS providers by 2009.

  In light of the FCC's rules prescribing the maximum number of CMRS licenses in a market, the industry proposed that there will be two cellular licenses, 6 PCS licenses, and 1-2 satellite or SMR licenses. There must be some accommodation for the fact that: licensees may hold more than one license in a market, not all licenses will be purchased, the relative ability of markets to support numerous carriers, the trend toward consolidation, and handsets with multifunctionality.

  CLECs:

  NANPA assumed there will be the equivalent of 27 CLECs in 23% of the rate centers (i.e., one equivalent CLEC has 4,386 equivalent CO Codes) by 2010, resulting in an exhaust date of 2008.

  Because this number is the most unpredictable, the industry questioned NANPA's assumptions. For example, NANPA assumed that the full (27) CLEC presence in a rate center if just one CLEC had a presence in that rate center today. The industry could not adequately speculate and reach consensus around what number should be substituted. To show the sensitivity and importance of these assumptions, 20 CLECs in fewer rate centers were run through the model. Changing the number of CLECs and/or the number of rate centers resulted in exhaust dates ranging from 2016 to 2023.

- NANPA indicated that CMRS providers were in 14% of the rate centers. The industry questioned the methodology used to calculate this percentage. The industry numbering experts believe that 14% is too high.

- NANPA included paging in the pooling model despite the exclusion of paging from the FCC's LNP rules.

- NANPA used 2000 as the start date for pooling for all industry segments despite the absence of an FCC order, or the ability of CMRS carriers to implement pooling by this date.

- NANPA assumed that pooling will be deployed everywhere, i.e., ubiquitous deployment.

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