

# Number Utilization Forecast and Trends

Lockheed Martin - CIS

NANPA

1-29-99

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# Topics

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- ◆ Lockheed Martin NANPA will start processing our first annual COCUS (the 1999 COCUS) after surveys are received from the industry shortly
  
- ◆ The following material follows from our baseline analysis in preparation for this processing:
  - NPA Assignment Growth Projections
  
  - CO Code Assignment Growth Projections
  
  - Thousands Block (1KB) Pooling - Impact on Estimated NPA Growth and CO Code Growth

# Available NPA Resources for US

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◆ Current available NANP Resources for US Geography:

Total Available NXX NPAs	800
Reserved for NANP Expansion	80
Unassignable (N11, etc.)	20
Reserved for future NANP needs	20
Assigned/Reserved Service Codes	21
<u>Assigned to Inter'l Countries</u>	<u>41</u>
Total Available for US Geography	618

- ◆ There are currently 207 Geographic NPAs assigned in the US.
- ◆ There are currently 10 Service Codes assigned.
- ◆ Total geographic NPAs assigned is 248 (207+41).

## Current Utilization of NANP Resources



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	<u>Available</u>	<u>Assigned</u>	<u>% Assigned</u>
US Geographic NPAs	618	207	33%
CO Codes in US Assigned NPAs	163,944 (=207*792)	96,168	59%
TNs in US Assigned CO Codes (Estimated)	961,680,000 (=96,168 * 10,000)	328,340,000(E)	34%(E)

- ◆ Additional TNs are obtained by adding CO Codes.
- ◆ Additional CO Codes are obtained by adding NPAs.
- ◆ When NPAs exhaust, the only solution is to expand the current 10 digit NANP format.

# NPA Assignment History



NPA Assignment Rate 1991 - 1998:

<u>Year</u>	<u>New NPAs</u>	<u>Total NPAs(YE)</u>	<u>% Increase</u>	<u>Jeopardy</u>	<u>Previous Exhaust Forecasts</u>
1991	3	138	2%		(issued by prior NANPA)
1992	4	142	3%		
1993	4	146	3%		
1994	4	150	3%	7	
1995	17	167	11%	7	2031
1996	22	189	13%	6	2025
1997	43	232	23%	15	2036
1998	26	258	11%	28	(none issued)
1999	22(E)	280(E)	8%(E)	54(E)	

- Jeopardy = # of new NPAs declared in jeopardy in that year
- 54 Estimated 1/1/99
- % Increase = New NPAs / Prior year's Total NPAs

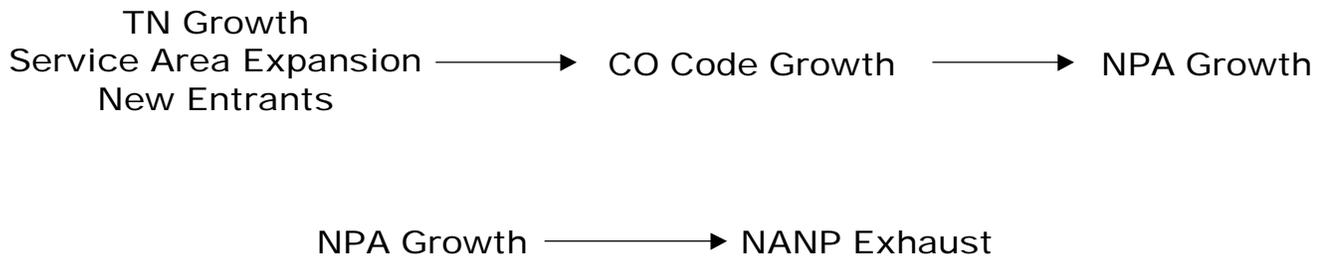
# NPA Assignment Projections



- ◆ The Table below provides the NANP Exhaust Date based on various yearly growth rates.
- ◆ It starts with 248 assigned NPAs out of a total of 659 available.
- ◆ Average of 94-98 NPA compounded growth rate: 12.2% NPAs/year
- ◆ Average of 95-99E NPA compounded growth rate: 13.2% NPAs/year

<u>Rate of Yearly Growth</u> <u>In Quantity of NPAs</u>	<u>NANP Exhaust</u>
6%	2015
8%	2011
10%	2009
12%	2007
14%	2006
16%	2005
18%	2005
20%	2004

# NANP Exhaust Drivers



- ◆ CO Code growth fueled by several factors (above), not necessarily TN consumption
- ◆ NPA exhaust results from CO code consumption, not TN consumption directly
- ◆ NANP exhaust results from NPA consumption

# Analysis of CO Code Use



## CO Code Use By Industry Segment as of December 31, 1998

CO Code Use by Segment	Code Type	NXX Count	Miscellaneous Allocation	Adjusted NXX Codes
CMRS	C	15,058	1,218	16,276
PAGING	B	9,333	-	9,333
CLEC	N	13,429	567	13,996
ILEC	N	55,807	756	56,563
MISCELLANEOUS		2,541	-	-
<b>Total CO Codes Assigned</b>		<b>96,168</b>	<b>2,541</b>	<b>96,168</b>

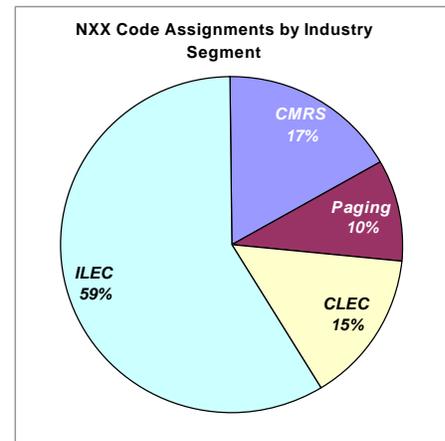
Note: Source data obtained from the Local Exchange Routing Guide ("LERG") a Bellcore report.  
Additional analysis by Lockheed Martin CIS.

# CO Code Use by Industry Segment



## CO Code Assignments - Summary

	(Actual) CO Codes 31-Dec-98	Segment Share
<b>NXX Code Assignments by Industry Segment</b>		
Commercial Mobile Radio Services ("CMRS")	16,276	17%
Paging	9,333	10%
<b>Total Wireless CO Code Assignments</b>	<b>25,609</b>	<b>27%</b>
Competitive LEC ("CLEC")	13,996	15%
Incumbent LEC ("ILEC")	56,563	59%
<b>Total Wireline CO Code Assignments</b>	<b>70,559</b>	<b>73%</b>
<b>Total CO Codes Assigned</b>	<b>96,168</b>	<b>100%</b>



## Historical CO Code Assignments (Estimate)



### CO Code Assignments - History

	(A)	(B)	(C)	(D) = (C) - (B)	(E) = (D) / (B)	(F)
	(Estimate)	(Estimate)	(Actual)	1998	1998	2 Year
	(Normalized)	(Normalized)	(Actual)	CO Codes	Growth	Growth
	Jan-97	Jan-98	Jan-99	Assigned	Rate	Rate
<b>Normalized CO Code Counts</b>						
CMRS	10,477	13,724	16,276	2,552	18.6%	24.8%
Paging	6,393	8,121	9,333	1,212	14.9%	21.0%
CLEC	2,376	6,128	13,996	7,868	128.4%	143.2%
ILEC	55,135	55,341	56,563	1,222	2.2%	1.3%
<b>Total</b>	<b>74,381</b>	<b>83,315</b>	<b>96,168</b>	<b>12,853</b>	<b>15.4%</b>	<b>13.7%</b>

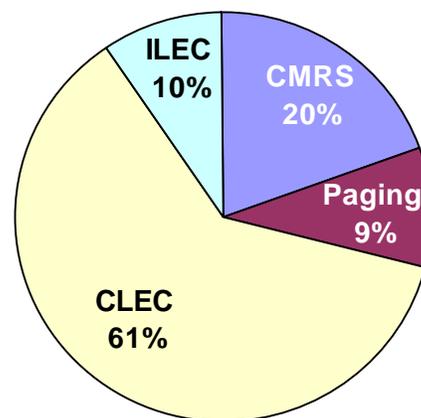
## Share of CO Code Growth by Industry Segment

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### Share of Growth by Industry Segment

- Percentage of total new CO codes assigned by segment
- Based on 1998 CO codes assigned



# Telephone Number (“TN”) Utilization by Industry Segment



## Telephone Number Assignment Summary

	(A) Total Telephone Numbers Assigned by Segment (M)	(B) Estimated Customers by Segment (M)	(C) Customer to TN Ratio	(D) = (B) * (C) Customer TNs (M)	(E) = (D)/(A) Estimated TN Fill Rate by Segment
<b>Telephone Number Assignments</b>					
Commercial Mobile Radio Services (“CMRS”)	162.8	69.0	1.01	69.7	42.8%
Paging	93.3	54.5	0.90	49.1	52.6%
<b>Total Wireless TN Assignments</b>	<b>256.1</b>	<b>123.5</b>	<b>0.96</b>	<b>118.7</b>	<b>46.4%</b>
Competitive LEC (“CLEC”)	140.0	4.0	2.00	8.0	5.7%
Incumbent LEC (“ILEC”)	565.6	168.0	1.20	201.6	35.6%
<b>Total Wireline TN Assignments</b>	<b>705.6</b>	<b>172.0</b>	<b>1.22</b>	<b>209.6</b>	<b>29.7%</b>
<b>Total TNs Assigned</b>	<b>961.7</b>	<b>295.5</b>	<b>1.11</b>	<b>328.3</b>	<b>34.1%</b>

## Customer to TN Ratio Assumptions

Customer to TN Ratio Assumption	(C) Ratio Assumption	
CMRS	1.01	[Allocation for TLDNs, Roamer Ports, VM (etc.), and System TNs]
Paging	0.90	[Allocation for 800 numbers and PIN pagers]
CLEC	2.00	[Allocation for DID and system TNs in a majority business environment]
ILEC	1.20	[Allocation for DID and system TNs in an incumbent environment]

### Sources:

- (A) Calculated from the Total CO Codes Assigned in the US \* 10,000 TNs/CO Code
- (B) Industry estimates from DLJ for Wireless and FCC for Wireline
- (C) TNs to customer ratio assumption derived from survey data

(D): Customer TNs is estimated number active and in-use TNs

# Model NPA Based on Average US Geographic NPA



## Model NPA Assumptions

Average Area Code (NPA) Statistics		
(A)	Total US Geographic NPAs	207 [In service as of December 31, 1998]
(B)	Total CO Codes Assigned YE 1998	96,168 [Total US CO Code Assignments as of December 31, 1998]
(C)=(B)/(A)	<b>Average NXXs Assigned per NPA</b>	<b>465</b>
(D)	Total NXXs Assignable per NPA	792 [Total NXXs assignable in a Geographic NPA]
(E) = (C)/(D)	<b>Average NPA Fill Rate</b>	<b>59%</b>

## Model NPA Calculations

	(F)	(G) = (C) * (F)
	<b>NXX Share by Segment</b>	<b>Total NXXs per NPA</b>
<b>Average NXX Utilization by Segment</b>		
CMRS	17%	79
Paging	10%	45
<b>Total Wireless</b>	<b>27%</b>	<b>124</b>
CLEC	15%	68
ILEC	59%	273
<b>Total Wireline</b>	<b>73%</b>	<b>341</b>
<b>Total NXX Codes Assigned</b>	<b>100%</b>	<b>465</b>



# Exhaust of Model NPA (“Bottom-Up Model”)

- Starting with Model NPA profile from prior chart , this model uses independent assumptions to forecast future CO code consumption
- CO code growth rates for existing local service providers are assumed proportional to market share growth rates projected by industry segment, by year, from DLJ, FCC, and historical trends
- Also assumed are CO code consumption by new entrants for service coverage
- Assumed new entrants by segment are from various industry sources
- Average of 0.5 - 1.5 new entrants per year per industry segment
- New entrants are assumed to need CO codes for service coverage based on historical rate center coverage percentages (10% of rate centers in NPA for CMRS, 25% for CLEC, 10% for paging)
- With projected CO Code growth rates, the Model NPA exhausts in late 2001
- Consequently, 50% of US geographic NPAs will exhaust by late 2001

No Pooling Scenario - CO Codes Required (Model NPA Exhaust)				
No Pooling Scenario	1998	1999	2000	Exhaust 2001
Total CO Codes Required				
CMRS	79	99	124	155
Paging	45	51	57	64
CLEC	68	115	198	294
ILEC	273	281	290	298
<b>Total Codes Required</b>	<b>465</b>	<b>547</b>	<b>669</b>	<b>811</b>
NPA CO Code Capacity	792	792	792	792
<b>CO Codes Available</b>	<b>327</b>	<b>245</b>	<b>123</b>	<b>(19)</b>

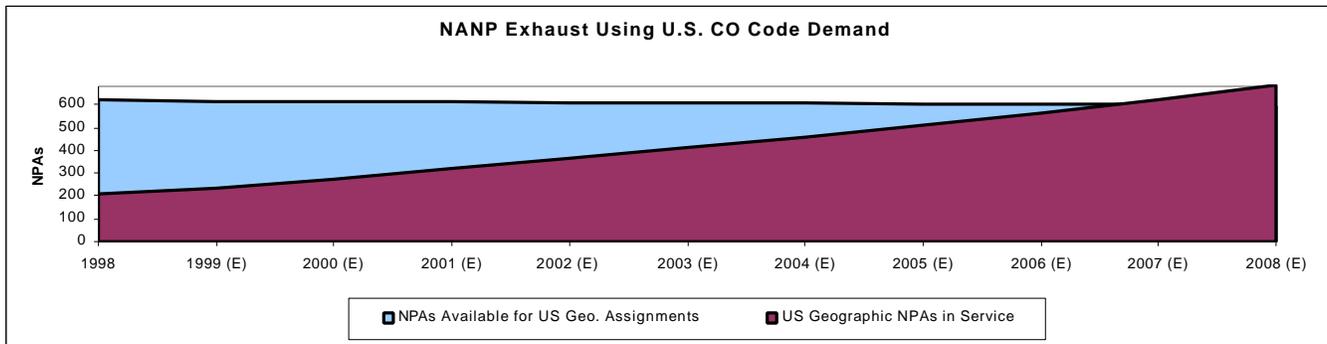
# NANP Exhaust by CO Code Demand



## NANP Exhaust by US CO Code Demand

Assumes new CO codes create new NPAs at a fill rate of 80%, versus 58.6% for current NPAs

	Growth NPA Fill	1998									Exhaust	
			1999 (E)	2000 (E)	2001 (E)	2002 (E)	2003 (E)	2004 (E)	2005 (E)	2006 (E)	2007 (E)	2008 (E)
NPAs Available for US Geo. Assignments	792	618	616	614	612	610	608	606	604	602	600	596
US Geographic NPAs in Service	80%	207	234	274	321	365	410	460	512	564	623	688
Remaining NPAs for US Geo. Assignment	634	411	382	340	291	245	198	146	92	38	(23)	(90)



**With prior CO Code projections, the NANP exhausts in 2007**

## TN Fill Rate Assumption for Model NPA

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### TN Fill Rate Assumption for Model NPA

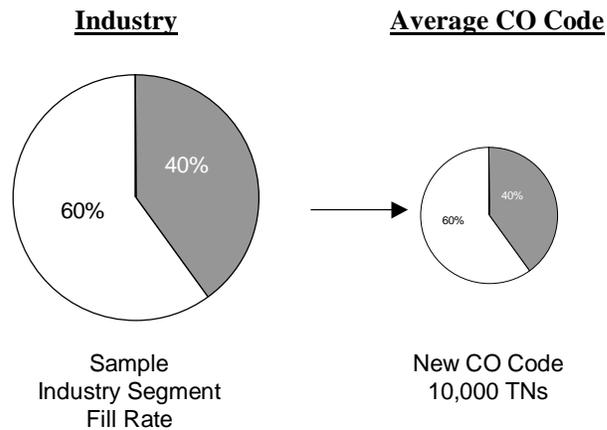
#### Industry Fill Rates [From TN Utilization Data]

CMRS	42.8%
Paging	52.6%
<b>Total Wireless</b>	<b>46.4%</b>
CLEC	5.7%
ILEC	35.6%
<b>Total Wireline</b>	<b>29.7%</b>
<b>Total NXX Codes Assigned</b>	<b>34.1%</b>

Industry average fill rate across industry segments is 34.1%

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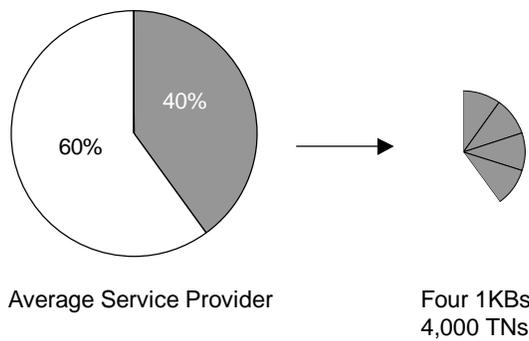
## CO Code Consumption - Fill Rate Impact



**Assuming that the industry or an industry segment uses 40% of the TNs assigned to them**

- Assuming that incremental fill rates remain constant, on average, each service provider is using 40% of each new CO Code assigned to them.

## 1KB Pooling - Fill Rate Impacts

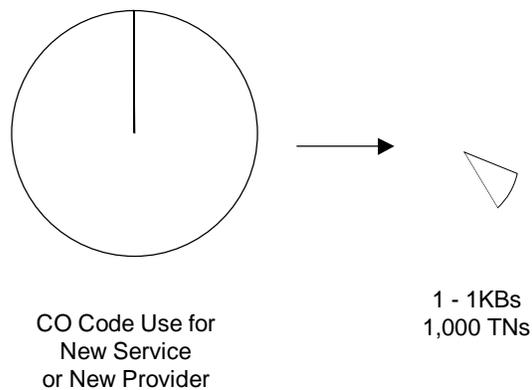


### If the industry implements 1KB Pooling:

- The average service provider will have a spares inventory based on TN utilization
- The embedded inventory allows them to attain close to 100% efficiency on each incremental 1KB they receive over one year's time
- Therefore assume 100% incremental consumption of 1K blocks in 1KB pooling

## 1KB Pooling - New Service or Service Provider

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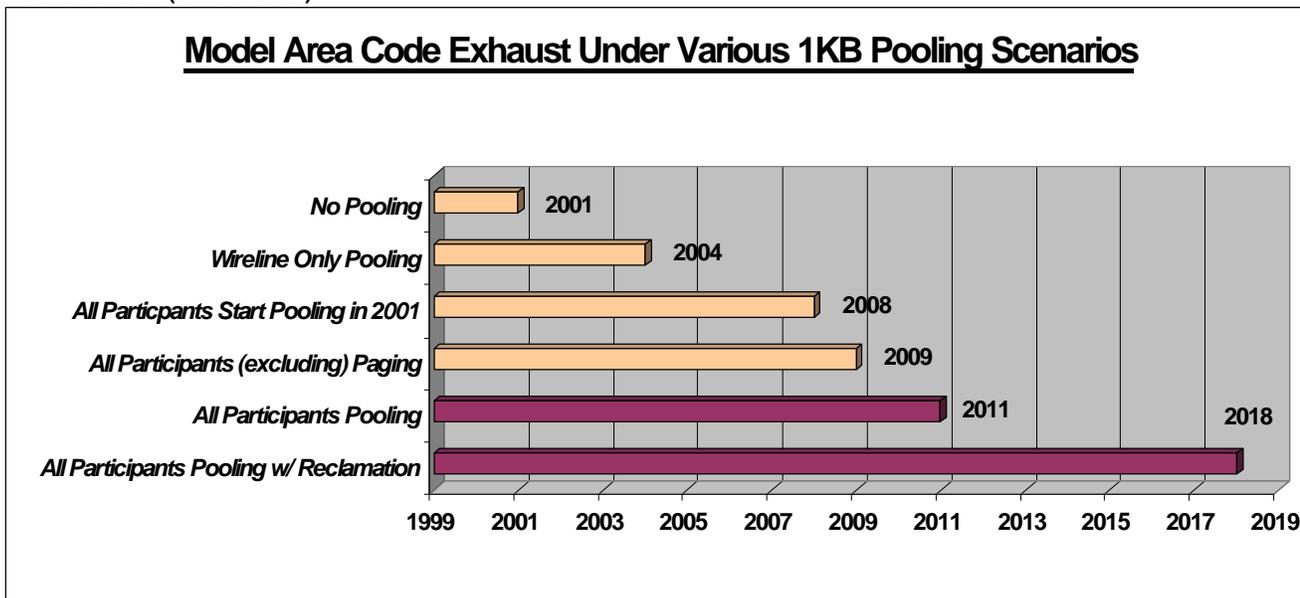
### **When a new service provider enters a service area or a new service initiates service:**

- Initial allocation of resource for increased service area is a 1K Block rather than a 10K Block (CO Code) per rate center

## 1KB Pooling Impacts by Industry Segment (Model NPA)



- Assumes 1KB pooling in model NPA in 1Q 2000 unless otherwise stated
- Wireline includes both ILEC and CLEC segments
- All participants = wireline + CMRS + paging
- Reclamation assumes contribution of half of eligible blocks (<10% contamination rate)
- Delay of starting pooling from 2000 to 2001 reduces model NPA life extension by 3 years (2008 vs. 2011)
- Wireline pooling adds 3 years life extension, incremental 5 years from CMRS, and additional 2 years from paging. Total of 10 years life extension (2001 -> 2011)



# NANP Exhaust w/o Conservation

