

Before the  
**FEDERAL COMMUNICATIONS COMMISSION**  
Washington, D.C. 20554

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In the Matter of )  
)  
Telephone Number Portability ) CC Docket No. 95-116  
) RM 8535

**COMMENTS OF THE  
CELLULAR TELECOMMUNICATIONS INDUSTRY ASSOCIATION**

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September 12, 1995

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## Summary

CTIA supports the goal of full number portability, and applauds the Commission's desire to establish a national number portability policy. CTIA maintains that any number portability plan that is adopted by the Commission must recognize that it is the telephone subscriber, *i.e.*, the end user who has the right to portability, and not telecommunications service providers.

While number portability is primarily driven by efforts to open the wireline local loop to competition, the creation of a plan that provides solutions for both wireline and wireless systems is essential to the development of competition between telecommunications service providers, as well as providing expanded customer choices, services, and products. However, there are important technical and policy considerations that must first be resolved before full number portability can be implemented in a wireless environment. For example, modifications are required to the wireless networks' signalling, routing, and translation functions, as well as fundamental changes to current network architecture. In addition, given the Commission's desire to establish a number portability policy to advance the twin

goals of personal mobility and fostering competition, the need for number portability may not be as crucial to the CMRS industry as it is to the landline telecommunications industry.

The Commission should permit review of each of the LEC-based proposals by the wireless industry and industry standards-setting bodies such as ATIS and TIA, and the new NANC, to develop and recommend solutions to number portability. Given the complex technical solutions that are needed to support number portability in a wireless environment, the Commission should assign to the industry the task of designing the appropriate architecture and devising a reasonable implementation schedule for wireless number portability. In the interim, the availability of portable codes, such as the 500 SAC, and perhaps new non-SAC portable NPA/NXXs can be made available for those subscribers who seek such a service.

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portability is beneficial to wireless customers, whether competition will be enhanced by enabling all service providers to make number portability available, and the leadership role, if any, that the Commission should take in the development of a national number portability policy.

CTIA applauds the Commission's desire to establish a national number portability plan and maintains that any number portability plan that is adopted by the Commission must recognize that it is the telephone subscriber, i.e., the end user, who has the right to portability, and not telecommunications service providers. Indeed, to accomplish the twin goals of personal mobility and fostering competition among service providers set forth by the Commission in the *Notice*,<sup>3</sup> portability rights must belong to the customer, not the service provider.

While number portability is primarily driven by efforts to open the wireline local loop to competition, the creation of a plan that provides solutions for both wireline and wireless systems is essential to the development of competition between telecommunications service providers, as

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<sup>3</sup> *Notice* at ¶ 4.

well as providing expanded customer choices, services, and products.

CTIA supports the implementation of number portability for both geographic and nongeographic numbers. We agree with the Commission's tentative conclusion that the portability of geographic telephone numbers benefits consumers by providing them greater personal mobility and flexibility in the use of telecommunications services and contributes to the development of competition among alternative providers of local exchange service and other telecommunications services.<sup>4</sup>

In addition, CTIA also supports the Commission's tentative conclusion that service provider portability of 900 and 500 numbers is beneficial for customers of those numbers.<sup>5</sup> In fact, CTIA has long supported number portability as an ultimate goal for the 500 service area access code ("SAC").<sup>6</sup> CTIA's Numbering Advisory Group

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<sup>4</sup> See Notice at ¶ 19.

<sup>5</sup> *Id.* at ¶ 7.

<sup>6</sup> See CTIA letter to FCC Chairman Hundt, Assignment of the 500 Service Access Code for Personal Communications Services, Docket No. IAD 93-01, dated December 14, 1993 (CTIA urged the FCC to immediately lift the freeze on 500 "SAC" code assignments without full portability).

("NAG") has worked closely with the Industry Carrier Compatibility Forum ("ICCF")<sup>7</sup> and recently submitted its recommended architecture plan for 500 number portability. Specifically, NAG recommended an architecture that will provide 500 SAC code subscribers the ability to effectively process calls from any terminal that is either fixed or wireless, regardless of the subscriber's chosen service provider.<sup>8</sup>

**I. NEAR-TERM IMPLEMENTATION OF WIRELESS NUMBER PORTABILITY IS NOT FEASIBLE**

**A. Wireless and wireline networks differ vastly.**

The current development of number portability proposals and trials are based on local exchange and interexchange network infrastructures. CTIA submits that any plan devised regarding the implementation of full number portability must include solutions for both wireless and wireline systems.

The solutions currently proposed by AT&T, MCI Metro, Nortel, and Stratus Computers all require: (1) the use of

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<sup>7</sup> The ICCF is a committee of the Alliance for Telecommunications Industry Solutions ("ATIS") which addresses, among other subject matters, numbering-related solutions. See Notice at n.16.

<sup>8</sup> See CTIA Exhibit 1, NAG Submission to ICCF, "Access Arrangements for New, Non-geographic Services Workshop, PCS 500 Access Arrangement," August 24, 1995.

LEC and interexchange call processing databases, which translate NPA-NXX codes to determine call routing; (2) the need for a database query or "dip" for translation of the NPA-NXX codes into a readable format that wireline switches understand; and (3) the use of the common channel signalling system 7 ("SS7") protocol to, among other things, exchange call processing and switching information between landline and interexchange networks.

Wireless networks employ "IS-41" as their signalling protocol. The IS-41 technology enables subscribers to use their wireless telephones throughout the nation, *i.e.*, "roam" (place calls over another wireless system's network outside of the subscriber's home market). IS-41 facilitates the exchange of data and other pertinent information between wireless switches, thus enabling different mobile switching centers to communicate with one another.

For example, when a telephone call request is transmitted over a wireless network the home switch serving the subscriber queries its home location register ("HLR") database to determine whether the subscriber is in good standing, *i.e.*, the process authentication and validation. Similarly in a roaming context, the visiting location

register ("VLR") database transmits IS-41 messages back to the home carrier's HLR to authenticate and validate the wireless telephone number associated with that subscriber and permit delivery of the call. However, unlike the landline and interexchange networks' signalling protocol, the IS-41 signalling protocol does not route calls based on NPA-NXX digits. Instead, IS-41 routes to a switch address associated with the system identification code.

**B. Modifications to wireless networks are needed to support CMRS number portability.**

None of the wireline-based number portability proposals will permit cellular roaming.<sup>9</sup> Modifications to current wireless signalling, call routing, and translation functions will be required to support call registration, validation, and call delivery of wireless systems in a number portability environment. Such modifications must not interfere with a wireless subscriber's ability to roam.

In addition to the modifications required to the signalling, routing, and translation functions of the wireless networks, other important technical and policy considerations must be resolved. For instance, wireless

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<sup>9</sup> See CTIA Exhibit 1, citing "Report of Illinois Commerce Commission Number Portability Workshop" ("Illinois Report") at 1, July 18, 1995.

network architecture will need to be modified to accommodate new number port addresses; new test procedures will need to be developed for number portability due to required modification of existing roaming functionalities; redundant and back-up systems must be updated; rating and billing modifications will be required which will impact the wireless carriers' post-processing methods; anti-fraud mechanisms to combat the wireless industry's \$565 million a year nationwide wireless fraud activity must be supported and not compromised; procedures must be devised to ensure that 911 calls are routed to the appropriate public safety answering point ("PSAP") operator; new procedures must be created for routing 611 repair and customer service calls; and law enforcement needs and wiretap law mandates must be supported.

The Illinois Commerce Commission's Number Portability Task Force, charged with investigating the development and implementation of longer-term database solutions for number portability based on Ameritech's Customers First Plan,<sup>10</sup> excluded wireless number portability issues from its consideration due to the vast complexity and number of

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<sup>10</sup> Notice at n.19.

concerns raised regarding number portability implementation in wireless systems.<sup>11</sup> Moreover, CTIA submits that number portability may not be as important to CMRS as it is in the wireline industry.

**C. Number Portability may not be as crucial in the CMRS industry as it is in the wireline industry**

As the Commission correctly notes, number portability offers two public interest benefits: (1) personal mobility<sup>12</sup> and (2) added competition.<sup>13</sup> As the Commission recognized, personal mobility is the essence of the CMRS wireless telephone service.<sup>14</sup> Thus, the major policy interest associated with the implementation of number portability for wireless customers is its effect on fostering competition. In landline networks, number portability is crucial because it represents a major impediment to customers changing carriers, and thus, changing their wireline telephone number. Indeed, if wireless carriers are to compete for

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<sup>11</sup> See *supra* at n.9; see also *Notice* at ¶ 14 and n.19.

<sup>12</sup> *Notice* at ¶¶ 4, 19.

<sup>13</sup> *Id.* at ¶ 5.

<sup>14</sup> *Id.* at ¶4 and n.3.

local loop customers, landline number portability will be crucial.

The need to foster competition in the wireless industry is not as significant as it is in the wireline industry given the more competitive structure of the wireless business. Also, broadband PCS service will require equipment that is not compatible with incumbent cellular radio equipment. Unlike the wireline network, where there is no need for customers to replace their CPE to change service providers, the lack of compatible wireless CPE poses an additional impediment to wireless customers' switching service providers. While wireless equipment manufacturers presently are exploring the development of dual-mode and dual-band CPE (equipment operating on the same frequency interface for both PCS-cellular, and analog-digital), the demand for such equipment is not clear given the inchoate state of dominant technologies in the development of the wireless services market.

In addition, the benefits associated with wireless number portability are lessened by other factors. Wireless subscribers make many more phone calls than they receive, by choosing when they can be reached (by turning their mobile

units off) and restricting the number of persons with access to their mobile telephone number. Thus, the value of mobile numbers to CMRS subscribers is not as great as a landline number. In addition, wireless numbers are not published and are rarely made available to directory assistance. As a result, it is up to wireless customers to provide their numbers to those whom they select to receive call from. Furthermore, the rate at which CMRS wireless customers "churn," (switch from one wireless service provider to another in the same market) due to competition, and normal non-competitive reasons,<sup>15</sup> reduces the need to implement number portability for CMRS.

## **II. THE COMMISSION SHOULD ALLOW INDUSTRY TO DEVELOP SOLUTIONS**

The current number portability proposals are LEC-based solutions that were developed without considering the specific requirements of wireless networks. CTIA urges the Commission to permit the wireless industry and its standards-setting bodies to address and resolve the complex

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<sup>15</sup> See Notice at ¶ 22 and n.27. In addition to the normal, competitive reasons identified in the Notice, cloning and other wireless fraud forces customers to change their mobile identification number ("MIN"), i.e., telephone number, when their account is fraudulently accessed.

technical issues to support number portability in a wireless environment.

In the interim, customer demand for CMRS number portability can be addressed by making some codes portable first, such as the 500 SAC, and perhaps non-SAC portable NPA/NXXs, rather than attempting to implement full number portability for all CMRS numbers. While this recommendation may not be a perfect solution, it promises CMRS customers who seek portability a relatively near-term solution that requires only a one-time change to their telephone number.

There is strong Commission precedent for permitting industry groups and representatives to cooperatively resolve difficult technical issues with minimal government oversight and intervention. In particular, in the recently-completed Numbering Administration proceeding,<sup>16</sup> the Commission set forth broad policy objectives and retained a role as the final arbiter for dispute resolution. The FCC assigned the North American Numbering Plan ("NANP") Administrator and the newly-chartered North American Numbering Council ("NANC") the task of developing and implementing number

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<sup>16</sup> In the Matter of Administration of the North American Numbering Plan, *Report and Order*, CC Docket No. 92-237 (July 13, 1995).

administration policies in an impartial and equitable manner.

CTIA believes that standards-setting bodies and industry fora, such as the new NANC, along with ATIS and TIA, which possess the requisite expertise needed to develop the most appropriate solutions to implementing number portability. The ATIS- and TIA-supported industry groups are currently reviewing number portability proposals and should be allowed to test and develop the needed inter-network protocols that will support number portability in the wireless context.

#### **CONCLUSION**

For the foregoing reasons, CTIA welcomes and supports the Commission's objectives in this proceeding to make number portability available for all telecommunications providers, including CMRS providers. However, CTIA submits that there exist a number of important distinctions that differentiate the benefits of number portability to wireless and wireline subscribers, and diminish the competitive need for number portability in the wireless context. In addition, the technical challenges to implementation of number portability in wireless systems have yet to be

addressed or resolved. Therefore, CTIA urges the FCC to permit the wireless industry to develop the network architecture and the technical standards needed to support LEC to CMRS and CMRS to CMRS number portability.

Respectfully submitted,



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August 12, 1995

CERTIFICATE OF SERVICE

I, Brenda K. Pennington, hereby certify that on this 12th day of September, 1995, copies of the foregoing Comments of the Cellular Telecommunications Industry Association were served either by hand-delivery or by first-class mail upon the following parties:

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**ICC NP WORKSHOP**  
**MISSION STATEMENT**

**Near Term**

Develop, evaluate and recommend a wireline service provider number portability solution and propose an implementation plan which:

- Meets the needs of MSA 1 consumers and carriers
- Is competitively neutral
- Is technically and economically feasible
- Satisfactorily meets the criteria described in the LNP Framework

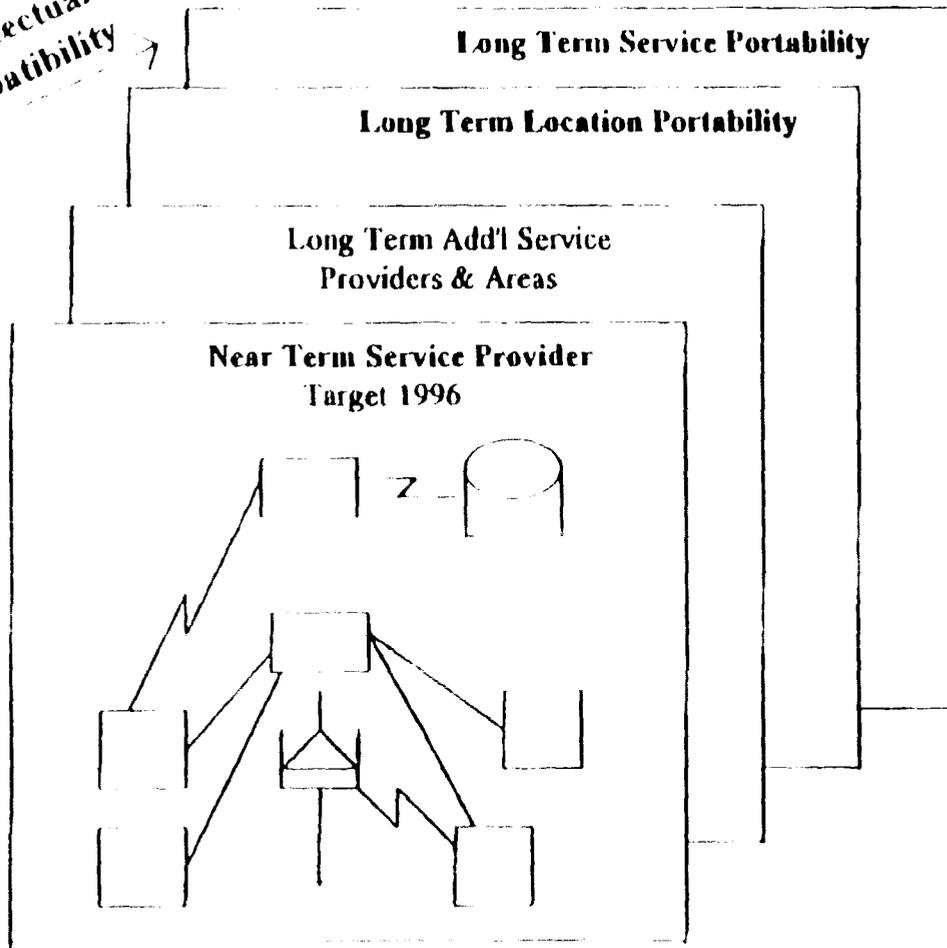
The end result will allow for the implementation plan which facilitates local service competition, in accordance with the Commission's order in Docket No. 94-0048 et al.

**Long Term**

Explore the desirability and feasibility of expanding wireline service provider number portability to provide number portability unencumbered by geography, service provider, service or time of day/day of week.

# ICC NUMBER PORTABILITY IMPLEMENTATION PLAN SCOPE

*architectural  
compatibility* →



## Near Term - Mandatory

### Area

- MSA 1  
(Ameritech and Centel Service Areas only)

### Service Providers

- Ameritech
- Centel
- 13-405 wireline certificated and facility based providers

## Currently Not Included

Wireless to wireless network Number Portability

Wireline to wireless network Number Portability

Wireless to wireline Number Portability

PCS Networks

## LNP Framework

	Attribute	Description	Weight
	<b>1. End User Impacts</b>		
	<ul style="list-style-type: none"> <li>A. Toll Indicator</li> <li>B. Call Redirection Transparency</li> <li>C. Ubiquity</li> <li>D. Directory Listing</li> <li>E. Repair</li> <li>F. Number Change Required</li> <li>G. Calls Requiring Intercept Treatment</li> </ul>	<p>Provide an alert to end users to indicate they have initiated a toll call. This alert may be a tone or brief "announcement"</p> <p>Customer will perceive no difference when a number is ported</p> <p>Portability available to all customers within selected service area</p> <p>Must provide mechanized directory info</p> <p><u>OPEN POLICY ISSUE</u> - 611 or separate repair numbers?</p> <p>Is a customer dialable number change required?</p> <p>Centralized intercept systems shall receive proper public number for announcement or operator routing</p>	
	<ul style="list-style-type: none"> <li><b>2. Triggering</b></li> <li>A. Originating</li> <li>B. N-1</li> <li>C. Terminating</li> <li>D. AIN</li>   <li>E. IN</li> <li>F. AIN Triggers                             <ul style="list-style-type: none"> <li>1. Originating DIP                                     <ul style="list-style-type: none"> <li>a. Existing</li> <li>b. New</li> </ul> </li> <li>2. N-1 DIP                                     <ul style="list-style-type: none"> <li>a. Existing</li> <li>b. New</li> </ul> </li> <li>3. Terminating DIP                                     <ul style="list-style-type: none"> <li>a. Existing</li> <li>b. New</li> </ul> </li> </ul> </li> </ul>	<p>Is solution capable of performing DB Dip from originating office?</p> <p>Is solution capable of performing DB Dip from N-1 office?</p> <p>Is solution capable of performing DB Dip from terminating office?</p> <p>Functions with Advanced Intelligent Network software:</p> <ul style="list-style-type: none"> <li>1. Release 0 0</li> <li>2. Release 0 1</li> <li>3. Release 0 2</li> </ul> <p>Functions with Intelligent Network software</p> <p>AIN trigger is used to launch database queries at the originating switch</p> <p>Are existing AIN triggers sufficient?</p> <p>Are new AIN triggers required? If so, describe</p> <p>AIN trigger used to launch queries at N-1 switch</p> <p>Are existing AIN triggers sufficient?</p> <p>Are new AIN triggers required? If so, describe</p> <p>AIN trigger used to launch queries at terminating switch</p> <p>Are existing AIN triggers sufficient?</p> <p>Are new AIN triggers required? If so, describe</p>	

## LNP Framework

	Attribute	Description	Weight
	<b>2. Triggering (cont'd)</b>		
•	<b>G. IN Triggers</b> 1. Originating DIP a. Existing b. New 2. N-1 DIP a. Existing b. New 3. Terminating, DIP a. Existing b. New	<p>IN trigger is used to launch database queries at the originating switch            Are existing IN triggers sufficient?            Are new IN triggers required? If so, describe</p> <p>IN trigger used to launch database queries at N-1 Switch            Are existing IN triggers sufficient?            Are new IN triggers required? If so, describe</p> <p>IN trigger used to launch database queries at the terminating switch            Are existing IN triggers sufficient?            Are new IN triggers required? If so, describe</p>	
• • A A	<b>3. Routing</b> A. Tandem Interconnection B. ALEC-ALEC C. Non-LNP Networks D. EO & TDM Routing XLINS Impact E. Calls to DID Numbers F. Trunk - Trunk Switching G. Reciprocity	<p>Capability to interface ALEC or LEC EOs to tandem switches            Calls completed w/o traversing LEC network            Solution provides interface to Non-LNP capable networks - e.g. Small HCOs Wireless, PCS</p> <p>State impact on switch tables/translations. For example, routing on PCS additional or multiple digit combinations.            Describe requirements for opening NXXs for ported to, ported from and non-participating switches. Switches have limitations on how many NXXs can be opened.            The proper called number must be forwarded to the PBX or Centrex trunks and Primary Rate ISDN trunks</p> <p>EO must have tandem capability (TRK-TRK SW) in order to handle misdirected calls            The chosen solution should ensure that the existing LEC and the new LECs are benefited in the same way and their implementation requirements are similar, regardless of their network topologies and whether the customers are switching from the existing LEC to a new LEC, from a new LEC to the existing LEC, or from one new LEC to another new LEC. The chosen solution should have minimal impact on the existing network.</p>	
	<b>4. Signaling</b>		
	A. New Messages/Content B. Terminating Switch ID	<p>Describe any new or unique service provider identifier in addition to the routing number</p> <p>Describe new or unique identifier to identify the terminating switch</p>	

## LNP Framework

	Attribute	Description	Weight
	<b>4. Signaling (cont'd)</b>		
	<ul style="list-style-type: none"> <li>C. New Signaling Values</li> <li>D. Capacity Impact</li> <li>E. New Stds</li> <li>• F. GTT</li> <li>G. Operator Services System                             <ul style="list-style-type: none"> <li>1. TOPS</li> <li>2. OSPS</li> <li>3. ---</li> </ul> </li> <li>H. 911/E911 Sys. Interface Impact</li> <li>I. DA Sys. Interface Impact</li> <li>J. Billing Interface Impact</li> <li>K. Signaling Requirements                             <ul style="list-style-type: none"> <li>1. SS7 Interoffice Signaling</li> <li>2. MF Interoffice Signaling</li> </ul> </li> <li>L. Error Handling</li> </ul>	<p>Describe new signaling parameters or values to avoid multiple queries and/or ensure proper routing (Would require standards work of North American Number Plan agreement/conformance by all carriers)</p> <p>State the impact of your architecture on the signaling network in a typical area containing 50 switches, assuming 100,000 ported numbers out of 5,000,000. Assume an average of 1.65 Busy Hour Originating Calls per station, 1.40 Busy Hour Terminating Calls per station, and .4 Busy Hour Intraoffice calls per station</p> <p>Describe new Stds Required-List to be submitted to Stds bodies</p> <p>Describe method to avoid 10-digit Global Title Translations in the STP. If 10 digit GTTs are used, describe offsetting benefits (E.G. for operator services)</p> <p>Describe any changes needed to current end office-to-TOPS or TOPS-to-EO/TDM signaling methodology</p> <p>Describe any changes needed to current end office-to-OSPS or OSPS-to-EO/TDM signaling methodology</p> <p>Describe signaling resources &amp; type required</p> <p>Describe signaling resources &amp; type required</p> <p>Describe signaling resources &amp; type required</p> <p>Requires SS7 signaling between originating, intermediate, and/or terminating switches</p> <p>Allows MF signaling between originating, intermediate, and/or terminating switches</p> <p>Properly handles errors &amp; recovers gracefully (including looping errors) Describe capabilities</p>	
	<b>5. Performance</b>		
•	A. Call Set-Up/Post Dial Delay	<p>State impact on call set-up time &amp; post dial delay for calls to ported and non ported numbers</p> <p>Must adhere to ILL. Adm Code 730</p> <p>PDD:</p> <p>Mean - 2.5 sec or less</p> <p>Max - 5 sec</p>	

# LNP Framework

	Attribute	Description	Weight
	<b>5. Performance (cont'd)</b>		
•	B. Transmission Quality	<b>Needed?</b> State impact on Transmission quality (ported & non-ported numbers) <b>Must adhere to ILL Adm Code 730</b>	
•	C. Blocking	Describe impact upon Call Completion Rate (ported & non-ported numbers) <b>Must adhere to ILL Adm Code 730</b>	
•	D. Network Reliability Impact	For example system impact when LNP database is unavailable or overloaded (ported & non-ported numbers) <b>Must adhere to ILL Adm Code 730</b> <b>POLICY ISSUE - What is Policy/Requirement for Service Continuity when number is being ported?</b>	
	E. Method of Limiting Queries		
	1. Prevents "Looping"	Prevents the possibility of multiple trunk seizures due to a looping condition	
	2. Limits Queries on Intraoffice Calls	Offers a method to avoid queries on every intraoffice call	
	3. Limits Queries on Interoffice Calls	Offers a method to avoid queries on every interoffice call (originating, intermediate, or terminating)	
	4. Avoids Redundant Queries	Offers a method to avoid multiple database queries on the same call. For instance, querying multiple times in the network to reach the appropriate terminating subscriber	
	F. Network Management	Provides ability to identify and enable required network management actions, such as call gapping	
		A. On an entire switch, including ported numbers	
		B. On a specific ported number	
	G. Government Mandates	Solution must support essential services and National Security Emergency Preparedness Solution must support law enforcement and wire tap legislation	
	<b>6. Service Interactions</b>		
	A. ANI Based Features	Describe any feature interactions or impacts	
	B. Switch Features	Describe any feature interactions or impacts	
	C. ISDN Features	Describe any feature interactions or impacts	
	D. Messaging Services	Describe any feature interactions or impacts	
	E. Telephone Relay Services (TRS)	Describe any feature interactions or impacts	
	F. Vertical Services	Describe any feature interactions or impacts	
*	G. Full Equal Access/Multiple PIC	Ability to support/pass infor necessary to permit multiple PIC scenarios - transparent to end user (consistent with Customer First Order)	
	H. Abbr. Dialing Methodologies	Describe any feature interactions or impacts	