

APPENDIX

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This Appendix identifies two sets of actions Verizon Wireless must take to comply with current Commission Rules. Section A delineates the steps the company must take to become capable of participating in thousands number block pooling. Section B delineates the separate, additional steps it would be required to take, above and beyond the steps needed for pooling, to comply with the single number portability mandate.

A. LRN-BASED NETWORK REQUIREMENTS FOR POOLING

1. The LRN Routing Method

TBNP utilizes the same LRN routing methodology that serves as the foundation for LNP. An LRN is a unique 10-digit number assigned to identify each switch or point of interconnection.¹ The first six digits of the 10 digit LRN are used to route calls to the appropriate carrier's home switch for the number that has been ported or pooled. This represents a significant change from the typical existing CMRS routing scheme, where the full NPA-NXX-XXXX dialed number determines the incoming call route.

When numbers are donated to a pool and reassigned to other carriers in thousand blocks, an LRN is reassigned that uniquely identifies the switch owned by the new thousand block holder. The sending switch must recognize the appropriate home switch of the dialed

¹ Deployment of the LRN routing methodology was a recommended solution as part of implementing LNP Phase I. *See* NANC Architecture & Administrative Plan for Local Number Portability, Appendix C Section 7.2 of the NANC LNPA WG Report on Wireless Wireline Integration. *See also* Wireless Number Portability Subcommittee NANC Report on Wireless Number Portability Technical, Operational and Implementation Requirements, Phase II Section 5.4.2 LRN Assignment. ATIS Location Routing Number Assignment Practices, INC 98-0713-021.

number and identify the correct carrier in order to ensure proper call completion and accurate billing.² Thus, to support TBNP, all carriers must implement the LRN functionality to route calls in and out of their networks.

Routing calls based on the LRN will result in an increased volume of messages between the switch and the associated network functions, which will require additional transport network capacity, as well as expansion of memory and processing capabilities.

2. MIN/MDN Separation

In granting temporary forbearance of the CMRS LNP requirement, the FCC recognized the significant technical challenges that mobile carriers face in providing LNP due to the mobile nature of CMRS services and the need to facilitate nationwide roaming.³ Currently, most wireless customers are identified with one Mobile Identification Number (“MIN”) that serves as both the dialable phone number and the mobile station identifier. In a pooling environment, mobile subscribers will require two types of numbers: a Mobile Directory Number (MDN) and Mobile Station Identifier (MSID), which is a 10-digit MIN. The MDN will be the dialable NANP telephone number. The MSID will be non-portable and non-dialable.

² See CTIA Report on Wireless Number Portability, Section 1.4.1; Number Portability Technical Operation and Implementation Requirements, Phase II, Section 5.4.2 LRN Assignment);

³ See 1999 Forbearance Order. See also, North American Numbering Council, Local Number Portability Administration Working Group, 2nd Report on Wireless Wireline Integration, Section 6.2 Open Issues, Support of National Roaming; Number Portability Technical Operation and Implementation Requirements, Phase II, Section 3.4.1 Major Impacts, MIN/MDN Separation Wireless.

Cellular carriers will use the MSID to identify the physical mobile station. The first six digits of the MSID are referred to as the MIN block identifier (“MBI”) and can be used to uniquely identify the service provider. Thus, the MSID will authenticate and register the subscriber onto the wireless network and also will identify the subscriber’s service provider. A wireless customer will need to be identified by a separate MSID (10-digit MIN) and a separate MDN in order to identify the appropriate provider in a pooling environment.

Due to the need for a separate assignable MSID, the wireless industry must establish a new process for administering MSIDs, apart from the administration of the MDNs by NANPA. The wireless industry, working through CTIA, has selected a third party MBI administrator. This requirement is unique to the wireless industry and therefore, has made implementation of the LRN network infrastructure more complicated for wireless carriers than it was for landline carriers.

The MIN/MDN separation process requires changes to many CMRS systems (*e.g.*, inventory loading, tax, point of sale, customer provisioning, customer care). These systems and the interfaces that connect them must be reprogrammed to store and use both the MSID (10-digit MIN) and the MDN. Network switches and adjunct elements must be upgraded and reformatted to recognize the MIN/MDN separation. Additionally, all services utilizing NPA-NXXs (*e.g.*, Prepaid, E911, Voice Mail, data services, CALEA) will need to be modified to accommodate the MIN/MDN separation, which will require changes to billing, provisioning, operational support and fraud systems.

3. Roaming

The MIN/MDN separation is necessary so that roamers with pooled numbers can continue to roam while outside their home market. The MIN/MDN separation will preserve

existing wireless handset/equipment registration on the wireless network and roaming record reconciliation for customers. In order to ensure continued nationwide roaming, all wireless switches serving the top 100 MSAs, and those outside the top 100 MSAs that complete pooled number calls, must be upgraded to recognize the separation of the MDN from the MIN.⁴ Customers will need to be identified by their ten digit MINs, not their MDNs.

Currently, billing systems identify roamers through the NPA-NXX of their MDN. Once pooling is implemented, the MIN Block Identifier (MBI) (the first six digits of the MIN) will identify a customer's service provider. All roaming partners will need to adjust their networks to use the MBI to identify a customer's service provider, *even if they are outside the top 100 MSAs*. Carriers must modify agreements with roaming partners, particularly with regard to pooling-related information that needs to be exchanged, and complete significant testing to ensure uninterrupted service to roaming customers. Testing is scheduled to be initiated in conjunction with the wireless porting inter-carrier test timeframe, October 2001 through May 2002, or upon request of roaming partners during and/or beyond this timeframe.⁵

4. NPAC Pooling Functional Requirements

TBNP and LNP both require implementation of a communication process to share call information among multiple providers and third party administrators. However, if CMRS carriers are relieved of the obligation to provide LNP, the communication requirements, and related investment and operational expenses, will be reduced significantly. To accomplish

⁴ ATIS standard TR 45.2 created the IS 41 standards along with the IS 765 and IS 756A standards, which were used by vendors to develop the wireless LNP network solution, LNP Phase II.

⁵ See Wireless Number Portability Subcommittee Technical Operations and Implementation Requirements, Section 4.0, Implementation Milestones and the Wireless Inter Carrier Test Plan.

pooling a carrier must communicate with and work through the Number Portability

Administration Center (“NPAC”). The primary functions that must be enabled include:

- (1) identifying thousands blocks of an NPA-NXX for which the carrier is the code holder (thousand block creation);
- (2) donating thousand blocks to the pooling administrator;
- (3) retaining contaminated working numbers in the code holder’s carrier database (intra – service provider ports of contaminated numbers);
- (4) communicating information to enable use of contaminated blocks of numbers;
- (5) opening up thousands blocks of an NPA-NXX for which the carrier is the block holder (creating an NPA-XXX-X Holder Information Table).

These five types of communication will occur far less frequently for pooling than they would for porting transactions. Communication with the NPAC would need to be established only when a carrier obtains a new NPA-NXX from NANPA, and these transactions will occur at the block level, instead of a line-by-line level.

The communication system must be linked to telephone number inventory systems and all billing systems to ensure that the status of donated and received numbers from contaminated blocks are tracked correctly and that NPAC transactions are initiated accordingly. This communication process, while critical, can be achieved with fewer resources than could the broad-reaching communication system that would be required to provide number portability for customers.

B. ADDITIONAL TASKS REQUIRED TO IMPLEMENT NUMBER PORTABILITY BUT UNNECESSARY TO ACHIEVE POOLING

While the LRN network architecture serves as the technological foundation for pooling, there are many additional tasks required for provisioning number portability that are not required to implement number pooling. Most of these tasks are related to inter-carrier communications, customer service and the management of customer records in LNP

transactions. Partial forbearance, by relieving CMRS carriers of the LNP obligation, will eliminate the need for carriers to invest in these additional requirements.

1. Point Of Sale Systems To Port-In Other Mobile Telephone Numbers

To enable acceptance of a foreign MDN from another carrier's customer, Verizon Wireless would need to develop and introduce new functionality to all point of sale ("POS") systems that support all sales channels and customer care operations. Current POS systems assign customers new numbers from a centrally-administered telephone number inventory, but that will not suffice for number portability. Instead, POS systems will need additional capability to add a single ported-in number to the inventory, request an activation with a ported number, and track the status of the port request. These systems must be able to accept a foreign MDN, validate the MDN, and confirm that the foreign MDN meets all porting criteria. The POS systems also must initiate the inter-carrier communications process for port-in transactions, as well as manage the return responses. Once the inter-carrier process is completed, these POS systems will need to associate the correct MIN with the foreign MDN to prevent porting outside of a rate center. This complexity increases the risk of failure in each additional step of the activation process.

Due to the nature of wireless interconnection, it has not been necessary in the past for service providers to obtain numbers associated with all rate centers. Customer calling areas are large, and are not linked to a customer's landline rate center. Carriers have opened rate centers only where necessary to provide customers the option for local rated land-to-mobile calls from most areas, and this process has facilitated efficient number utilization over wide geographic areas.

Within the LNP environment, CMRS carriers will need to track the relationship between wireline rate centers, NPA-NXX codes and CMRS providers' service areas, a major complexity that will make CMRS LNP more difficult than landline LNP. The recipient and donor service providers' coverage areas must both include the underlying landline rate center associated with the telephone number. This is complicated because there is no relationship between wireless service areas and rate center boundaries. When a customer requests to port his MDN onto the Verizon Wireless network, Verizon Wireless will need to develop and maintain a tool to: (1) identify the rate center of the customer's MDN; (2) confirm that the MDN's rate center is located within Verizon Wireless' service area, and (3) determine which Verizon Wireless switch the rate center is served from and ensure that the appropriate MIN is assigned. If customers' MDN is not within Verizon Wireless' service area, the sales representative will need to explain to the customers why they cannot port their number for Verizon Wireless service.

From a systems perspective, no such rate center database tool exists today. It will need to store rate center information for the entire country (nearly 20,000 rate centers) and will need to be updated at least monthly when the LERG is published with new NXX codes. The data model must account for and store all MDNs, not just Verizon Wireless specific MDN information, and must be maintained continually.

2. Training Of Sales And Customer Service Personnel

If Verizon Wireless is required to enable customers to port their numbers, the company will need to provide extensive training to all of its sales and customer service personnel to prepare them to answer complex questions from customers. Sales agents will need to understand the porting process and the necessary inter-carrier communication requirements to

ensure that customer numbers are ported correctly. They will need to be able to explain to customers why they may be able to port their numbers in certain situations but not in others, and to deal with the customer dissatisfactions that may result. Unlike the landline situation, most wireless ports will be initiated between a customer and a live sales representative, and the port will be completed within a period of a few hours instead of a few days. Absent LNP, in-store activations typically take 30 minutes. Consequently, customers may be inconvenienced and disgruntled by delays in activations that result from LNP. Agents will need to be well informed about LNP requirements and processes. For example, they may need to explain to a customer why his or her handset will not work for a few hours until the port is completed -- a new experience for customers who are accustomed to leaving a wireless provider's store with a working phone. Number portability will require training resources that could otherwise be used to inform the sales force about new product offerings or about how to respond to customer questions on price plans and service options.

Based on the landline experience, there will be a significant increase in demand for customer service due to LNP-associated problems (*e.g.*, inadvertent ports). Given the complexity of the rate center limitation, number portability may yield increased complaints regarding local coverage areas among new customers who live and or operate their phone within a local coverage "fringe" area (*e.g.*, near the boundary of the local coverage area). There are multiple markets nationwide in which the local coverage areas of competing wireless carriers differ markedly. Sales personnel will need to be trained to handle customer questions about the relationship between different rate centers and carrier-specific coverage areas and to use the MDN/rate center confirmation tool to identify "fringe" area and "near-fringe" area rate centers. The tool will display maps that include coverage area, NPA-NXX

location, and a customer's primary address of operation, and facilitate sharing of information between sales representatives and customers. To be effective, the MDN/rate center confirmation tool must be accessible from the initial POS order entry screen and be flexible enough to provide quick access to any customer service or sales representative. Training the sales channels to use this POS system and handle complex rate center questions will require dedicated training and supervisory resources.

3. Billing System Development To Integrate Other Carriers' MDNs Into Verizon Wireless' Systems For Taxation And Number Inventory

To facilitate number portability, carriers will need to build new functionality into multiple systems relating to telephone number inventory, rating, taxation and a host of other programs. None of this functionality is necessary to achieve pooling.

Carriers will need to load foreign MDNs on a per number basis for each port-in activation. The loading of these foreign MDNs will not follow the loading process normally used when new number inventory is provided from NANPA. All associated information required during loading (market assignment, home switch identifier, *etc.*) will be identified and added to the inventory tables at the time of the port-in transaction. The normal MDN loading process loads line ranges up to 10,000 numbers in one transaction, as assigned to the carrier by the NANPA. In contrast, a port-in load transaction will load numbers one by one.

A carrier's telephone number inventory will need to include new status types for port transactions, *e.g.* port-in and port-out. Carriers will need to update the telephone number (MDN) status continually to account for new porting activities. Carriers will need functionality to ensure that numbers that are ported-out are not assigned to new customers, and that ported-in numbers are "snapped-back" to the old service provider when disconnected,

instead of being re-assigned to a new customer. Upon receipt of a “snap-back”, the MDN must be returned to the available pool of assignable numbers. New maintenance routines will need to be created to ensure that proper NPAC transactions are initiated depending on the MDN status. This “snap back” problem may be immense, given the hundreds of thousands of wireless customers who simply terminate their service each year with a particular carrier.

Carriers will need to expand all their rating and taxation systems to account for all rate centers that may be potential donors of foreign MDNs within the carrier's license area. The rating systems need to ensure that all toll and long distance rates are calculated correctly for foreign MDNs, which will require more data space and computing capabilities.

With respect to taxation, each carrier must be able to apply the correct tax rate based on customer's MDN. Currently, carriers must only apply the proper tax to the MDNs it manages. With porting, carriers must expand tax tables to cover all MDNs that are open for porting, which will require significant and costly increases in data storage capabilities. Again, these considerable expenditures would not be needed for pooling alone.

4. Overhaul Of Reseller Systems To Accommodate Reseller “End User” Porting

Resellers currently are provided with a set of tools that enables them to manage their own customers. With the onset of the LNP obligation, resellers will need to be far more integrated with carrier systems to enable porting transactions.

While resellers manage their customers' information, the facilities-based service provider has responsibility for the telephone number inventory and may need to facilitate the inter-carrier number portability process, including pre-port communications. If a reseller elects to build its own infrastructure to support the inter-carrier process, the facilities-based provider

(as the code holder) will still need to initiate and complete the porting transaction with the NPAC. Because the facilities-based provider acts as the liaison between the NPAC and the reseller, new interface points to support porting transactions will need to be determined between each reseller and carrier. All systems that resellers use (*i.e.*, number management systems, activation systems) will need to be enhanced to allow the porting-in of a foreign MDN. This information has to be passed through from the resellers' customer-facing system(s) to the facilities-based provider, so that the network elements can be updated with the MIN/MDN pair for the port-in activation.

Carrier operation groups that support resellers will need to be specially trained to handle porting transactions. This is a unique situation wherein the carrier does not have the customer information, but may be contacted for a port request since they are the holder of the MDN. Agreements between carriers and resellers need to be restructured to insure that the responsibilities and liabilities are clearly defined, including ownership of the obligation to meet the industry porting time window requirement. All of these complications to the carrier – reseller relationship flow from the portability requirement.

5. Development and Staffing of a Porting Center

Customer questions and problems associated with LNP are likely to be complex and take significant time to process, requiring wireless carriers to deploy a specialized pool of customer service representatives who are knowledgeable in LNP and devoted to this effort. Whether a centralized or decentralized structure is used, number portability will require the equivalent of a small porting center and the addition of a substantial number of supporting customer service representatives.

One of the difficulties in preparing for LNP is projecting the actual number of ports that customers will demand. While Verizon Wireless believes that the availability of number portability will not by itself spur customers to change carriers, many customers will likely opt to retain their existing numbers if LNP is available, even when they decide to switch carriers for wholly separate reasons. Consequently, through the natural course of competitive churn, Verizon Wireless could face a large volume of porting activity, all of which will need to be serviced, even if number portability is not providing any discernible competitive benefit to customers.

Larger carriers may need to hire, train, manage and supervise potentially hundreds of new employees to handle portability transactions, at a cost of tens of millions of dollars year after year. Due to the complexity of these transactions, porting-related customer service calls likely will be longer than other customer service calls. For example, several contacts may be needed to complete an activation (including trouble-shooting). These commitments of carrier time and money will divert resources that could otherwise be deployed toward offering new features and services.

6. Communication Process with NPAC and Other Carriers

As discussed above, TBNP and number portability both require communication with outside parties to complete each transaction. However, number portability will require a much more robust and extensive communication system due to the larger number of transactions and the additional types of information that must be shared among providers. While communication with the NPAC is necessary to facilitate pooling, number portability will require simultaneous communication with both the NPAC and many other carriers. Moreover,

a range of customer-related information will need to be shared between carriers in order to complete a porting transaction.

A much more extensive, multiple-step process would be required (at least for large carriers) to provide automated and effective communication for number portability than what is required to accomplish pooling.⁶ Specifically, a mechanized Service Order Administration system (SOA) (which could be managed individually by carriers or by a shared third party service bureau) would be necessary to automate porting transactions, and to act as the mediator between all affected parties. In order to communicate with all other potential donor carriers for porting transactions, connectivity must be established and maintained *among and between all* participating carriers. This involves establishment and maintenance of many transaction protocols, connection points, and contact and escalation procedures. The porting-in and associated porting-out transactions involve a transfer of important customer information between a customer's new and old carriers.

A SOA system would manage the details of communicating with the NPAC and the inter-carrier communication process (*e.g.*, timer handling, transaction concurrence management, automated transaction initiation) of each port transaction. The SOA system would need to be integrated into other systems that must be accessed during a port transaction, including the billing and sales channel systems (*e.g.*, point of sale, agent systems, telemarketing, eCommerce, inventory management systems, fulfillment systems).

A port-in transaction involves multiple steps. At the new carrier's point of sale, the customer's information is recorded, the old service provider is contacted, and information is

⁶ Some smaller carriers may be able to fulfill their pooling obligation with a manual system, as many landline carriers are doing today, either by fax, email, telephone call, or the NPAC's "LTI" (Low Tech Interface) system.

exchanged between the two carriers until an agreement is reached on whether or not the customer can be ported. The inter-carrier communications process must be accomplished in a very short time period, with both carriers agreeing on the port transaction, and receiving confirmation of the transaction, including port-in, port-out, and disconnect transactions. After concurrence is reached between the two carriers, the NPAC is contacted. Once the new carrier completes its activation process, it must once again contact the NPAC so that the NPAC can then disseminate this new information to all other service providers so that all carriers are updated continually as to the identity of the carrier serving the ported number. Consequently, a single porting transaction will require multiple communications with the NPAC, including pre-port notification, concurrence notification, and successful transaction notification. Number portability will complicate the communication process significantly.

Beyond the information technology requirements, carriers will need to establish escalation procedures for porting transactions that cannot be handled in an automated fashion, *e.g.*, a customer's information transmitted by the other carrier does not match the information on file. Given the short porting windows established by the industry for porting transactions, operations groups will need to monitor and respond quickly to all potential fall-out, manual carrier and special cases (*e.g.*, porting blocks of numbers for businesses). These groups will need to be equipped with access to most systems, especially the systems that facilitate communication with the NPAC and other carriers, in order to resolve manual porting problems. Some larger wireline carriers are still working to overcome difficulties created by the manual port-in processes used by other wireline carriers (see discussion of LTI system above). The persistence of manual transactions adds time and complexity to carrier communications required for LNP, and will make CMRS LNP even more difficult. Thus,

back-up procedures must be developed for contingencies that cannot be resolved by an automated SOA system.

CERTIFICATE OF SERVICE

I, Anne Marie Pierce, hereby certify that on Thursday, July 26, 2001, a copy of the foregoing Petition Pursuant to 47 U.S.C. § 160 for Partial Forbearance From the Commercial Mobile Radio Services Number Portability Obligation of Verizon Wireless was served upon the parties listed below via hand delivery.

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