The LNPA must:

- Understand the intent of Industry-developed business rules when enforcing them so they are enforced appropriately
- Provide numbering expertise to a wide audience of interested constituents
- Recognize that the NPAC is a part of a larger communications ecosystem that relies on NPAC services being accurate and always available and how NPAC services affect downstream services and Industry objectives
- Evolve the service in lock step with Industry's needs today and in the future to continually improve the value to Industry
- Operate with unassailable neutrality

The Industry has a partner in Neustar that fully understands that the responsibilities of the LNPA extend beyond designing, building, implementing, and operating the NPAC/SMS to:

- Enforce LNP business rules and disseminate data
- Provision LNP orders
- Provide user support
- Provide user training
- Process invoices accurately

Additionally, Neustar goes above and beyond and delivers additional, vital services to meet the expectations of an evolving and competitive customer base. As evidenced by Exhibit 1.1-1, Neustar appreciates what it takes to provide services that continually keep pace with the needs of the Industry and surrounds the "core services" with value-added functions like:

- **Provisioning support**—we process hundreds of millions of complex transactions on behalf of all Service Providers.
- **Service management**—we monitor the entire LNP ecosystem and proactively reach out to Service Providers when their Local Service Management System (LSMS) or Service Order Administration (SOA) systems appear to be responding slowly.
- **Knowledgebase**—our expert and experienced personnel are always available to address questions and attend various industry forums, most notably the LNPA-WG, to present solutions to issues.
- **Disaster preparedness**—we support the Industry in recovery, via number portability, of communications services in the event of a disaster.

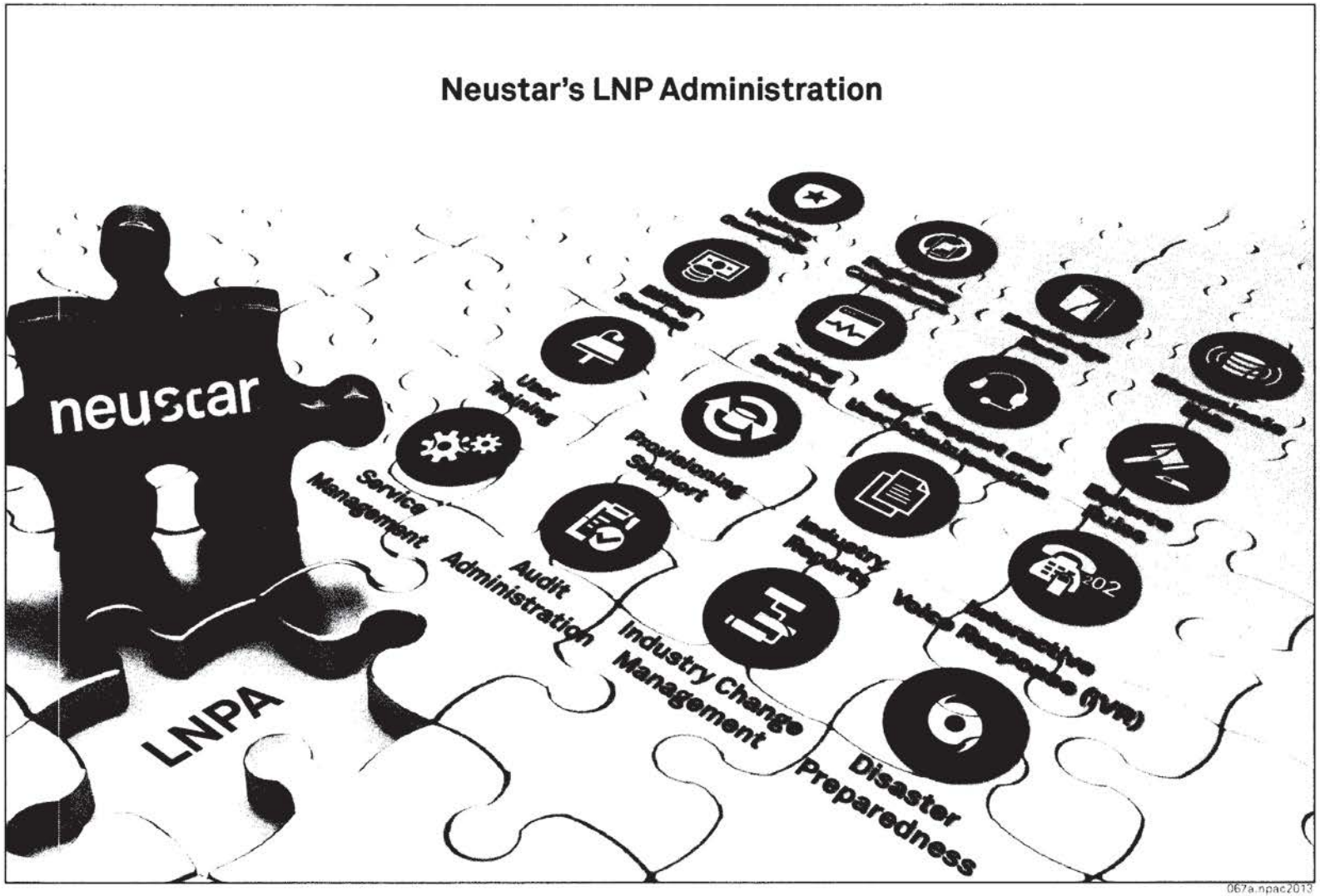

Exhibit 1.1-1: Operation of the NPAC/SMS is only a fraction of the full suite of invaluable functions performed by Neustar as the LNPA.

Neustar is acutely aware that the NPAC is not merely a database that processes transactions, but is rather about our people understanding the nuances of numbering and the specifics of portability to ensure success on behalf of our carrier customers.

> "I couldn't run my department without NeuStar and the trust I have in their knowledge."
>
> NPAC User Survey 2011

The following section sets forth the services—both "core" and "value added"—that Neustar will continue to provide for the next term.

1.1.1 Manage the User Administration Process

Access to the NPAC and use of NPAC data is strictly controlled and limited to specific, permitted uses. Neustar has successfully developed and implemented various processes to thoroughly review applicants to ensure compliance with the NPAC qualification process, all in an effort to safeguard NPAC data. We understand the complex interactions that take place as Service Providers and providers of telecommunications-related services (PTRS) interact with the NPAC for the exclusive purpose of routing, rating, or billing of calls, or for performing network maintenance.

A Primer on Number Portability in the U.S.

For a long period of time, the telephone number was all the information that carrier networks needed to route calls and establish connections using the first six digits (the NPA-NXX) to identify the specific switch in the network that served a particular customer.

The FCC Orders on Number Portability changed the status quo by focusing on movement of geographic numbers (not "toll-free" numbers) from one node in the Public Switched Telephone Network (PSTN) to another. For wireline service providers, these nodes in the PSTN networks are central office switches to which consumers telephones are connected. For wireless service providers, the NPA-NXX code points to the Home Location Register (HLR) containing internal network routing information. As depicted in Exhibit 1.1-2, the movement of telephone numbers from one PSTN node to another requires that there be a mechanism to associate a separate NPA-NXX code with each number that is ported since the ported telephone number no longer contains the NPA-NXX that identifies the serving switch. This appended address is the Location Routing Number (LRN) associated with each ported number in the NPAC database.

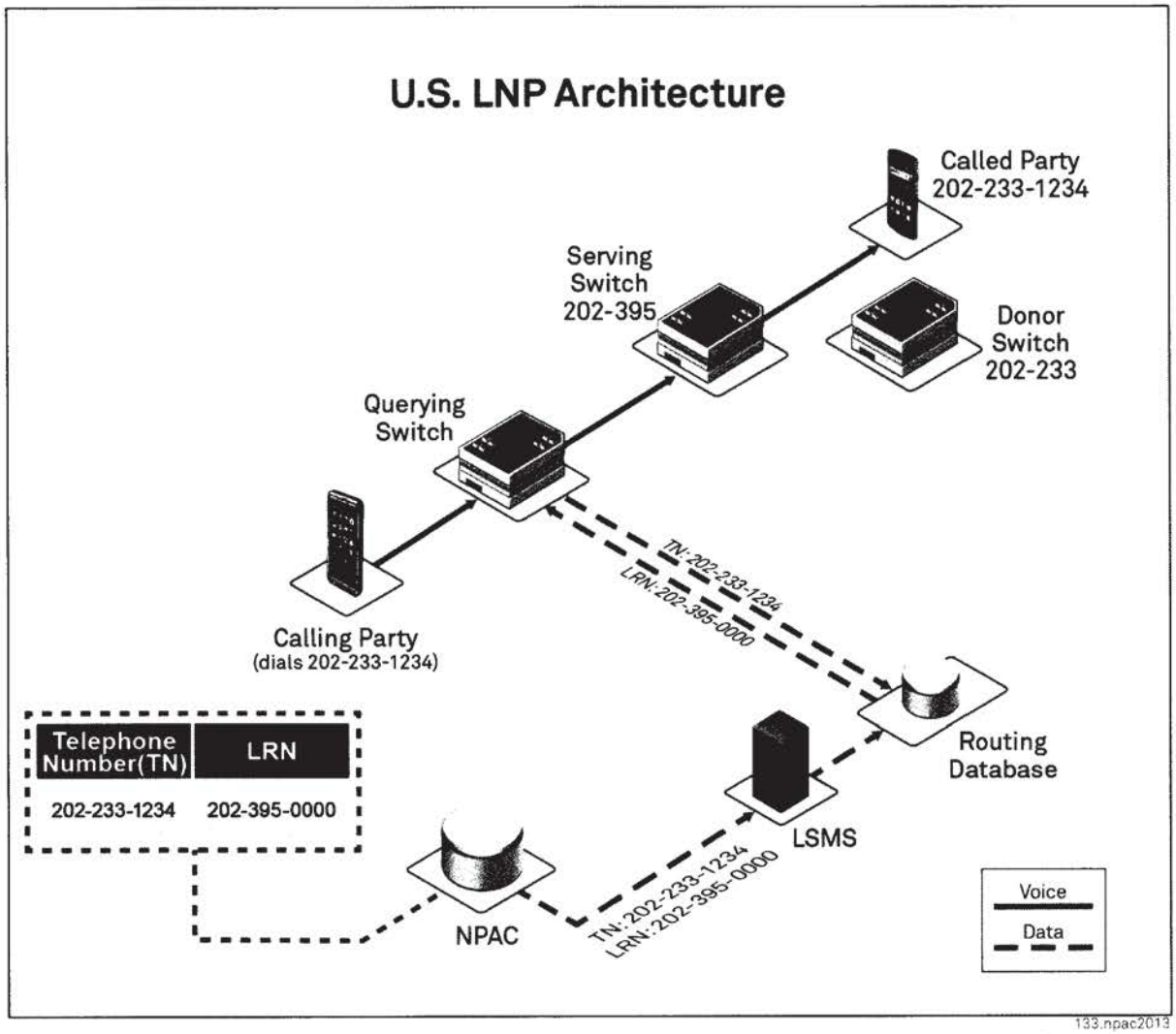

Exhibit 1.1-2: **There are no self-healing options if the NPAC database propagates incorrectly.**

Implementation of this LRN technology enables the telephone network to interrupt call processing and query a local database to identify the serving switch for a specific telephone number. This means that the NPAC, which propagates this information, has to be the **"golden database"**. There are no self-healing options available if this golden database sends information incorrectly. As demonstrated in sections below, at Neustar, we strictly control access to the data to preserve the integrity of this golden database.

Stringent Enforcement of Evaluation Criteria to Qualify for Access to NPAC Data

Potential NPAC customers often contact Neustar with minimal information on how to become an NPAC User and are unaware of the stipulations for Permitted Uses of NPAC data, the ways to access this data, and ways to use NPAC services upon becoming an NPAC User. Neustar has made available a dedicated team of employees within the Customer Connectivity Services (CCS) group that guide and manage the deployment and set-up processes for potential and existing Users of the NPAC. As shown in Exhibit 1.1-3, NPAC Users fall into two broad categories:

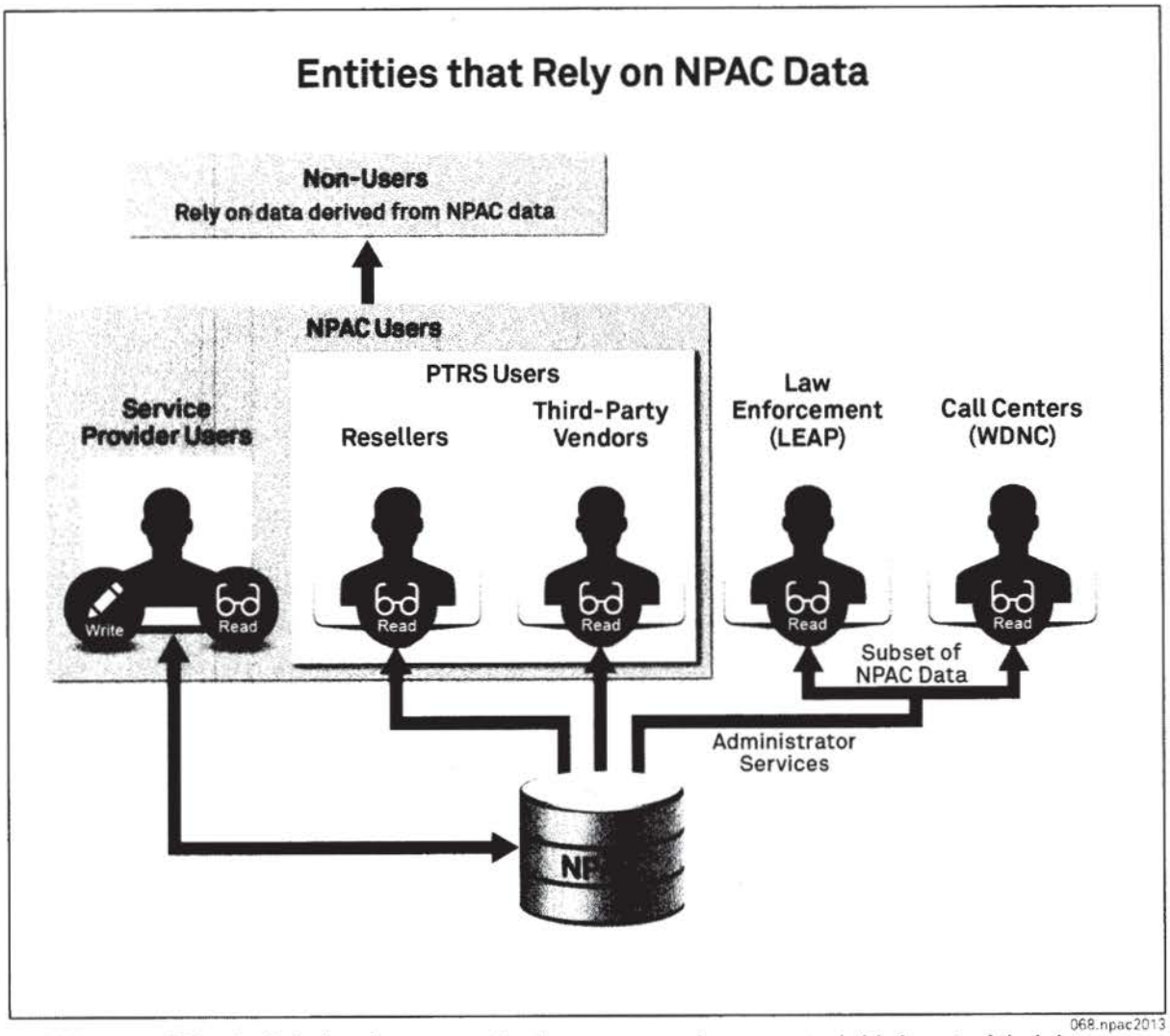

Exhibit 1.1-3: **Effectively balancing competing interests requires a neutral third-party Administrator.**

1. **Users with read and write privileges**—Service Providers are entities eligible to receive numbering resources such as NPA-NXX code assignments from the North American Numbering Plan Administrator (NANPA).

2. **Users with read-only access**—Providers of Telecommunications Related Services (e.g. third-party vendors, messaging aggregators, and resellers of telecommunications services).

Only those entities that are assigned numbering resources by the NANPA (and the National Pooling Administrator) are eligible to create, modify, and delete NPAC records. Currently, these are the entities that operate local switching nodes in the PSTN.

Many entities that do not qualify for NPA-NXX code assignments provide wholesale and retail telephone services by obtaining telephone numbers from the PSTN Service Providers and using the PSTN Service Providers' central office switches as PSTN gateways. While these entities do not route traffic between nodes of the PSTN, they may need

access to NPAC data for other reasons, such as to request a Customer Service Record (CSR) when facilitating a port request, to determine when customer billing should start, or to select a Least Cost Route when they have access to multiple Service Providers' PSTN gateway switches.

There are instances where NPAC data can reflect information of the provider behind a PSTN Service Provider. For instance, a "class 2 interconnected VoIP" provider must rely on its PSTN partner as a source of telephone numbers and to act as a PSTN gateway. It also must rely on its PSTN partner to create information in the NPAC database to identify it as the serving provider for the telephone number as well as to indicate other information pertinent to the service arrangement. By populating the "altSPID" field to identify the VoIP provider, the PSTN Service Provider indicates to users of NPAC data that the VoIP provider is actually providing telephone service for the number. If the VoIP provider were prepared to accept calls directly in the form of Internet traffic, the PSTN partner also could indicate that on the NPAC record (by noting that the "SV type" is "class 2 interconnected VoIP").

Comprehensive User Administration Process

Over the years, Neustar has developed unique qualifications that allow us to quickly determine the appropriate category a potential user should belong to and grant appropriate privileges to protect NPAC data. Neustar also has developed and implemented extensive logging capabilities that allow us to track system operations to maintain compliance with policy.

This thorough understanding of the requirements and their deliberate application allows only NPAC customers with read-write capabilities to create records in the NPAC database, which they then own, and can modify or delete, thereby ensuring data integrity. As show in Exhibit 1.1-4 and described further below, the CCS team provides dedicated, one-on-one support to potential and existing NPAC customers—from application evaluation, initial deployment requests, to modifications to access/services.

- **Application Qualification**—as a pre-requisite to all deployment activities, a Non-Disclosure Agreement (NDA) is provided to the applicant. Once an NDA is executed, the New User Application is reviewed to determine the applicant's eligibility for NPAC services. Prior to setting up access to the NPAC, the CCS team:
    - Obtains evidence that a state regulator in the NPAC region has granted a wireline applicant a certificate of Operating Authority and confirms that the applicant is eligible for NPA-NXX code assignments. For a wireless carrier, this operating authority evidence is its FCC radio license. Only those applicants that pass this screening are provided with read-write access to the NPAC.
    - Confirms, under the NUE process, that PTRS applicants are in fact providing, or intending to provide, a telecommunications-related service, that the service is impacted by porting and pooling, and that the use of NPAC data contemplated by the applicant involves or facilitates the rating, routing, or billing of a call, the performance of network maintenance and, thus constituting a Permitted Use. Applicants passing this screening are provided with read-only access to the NPAC.
        - In some cases, qualifying a PTRS applicant may be raised to the NAPM LLC. Once an application has been approved, User Agreements (UA) are processed for each NPAC region in which the applicant intends to access NPAC data and the NPAC. In an effort to ensure only valid data is created and disseminated to the LNP ecosystem, the CCS team will continue to manage the list of authorized representatives as designated by service providers.

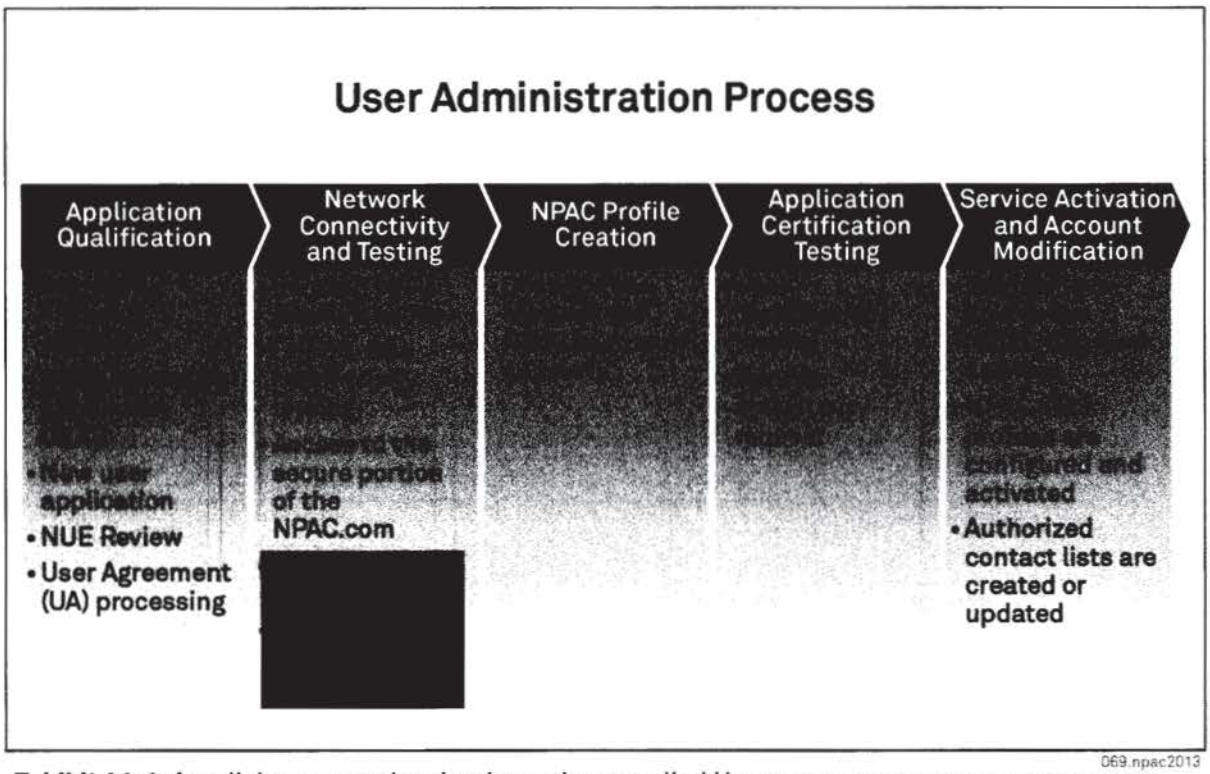

Exhibit 1.1-4: **A well documented and stringently controlled User access process serves to ensure that only authorized entities can gain access to critical NPAC data.**

- **Network Connectivity and Testing**—The method of network connection chosen depends on the type of interface (Mechanized or access by means of the new NPAC Portal) desired. Each connection method has a different set of activities associated with its setup. During the Network Connectivity phase, the CCS team works with the customer's network team, its IXC, and internal Neustar network engineers to manage network testing which includes end-to-end connectivity testing. To ensure no Service Provider's action causes NPAC/SMS service unavailability, Security-Related Information

  During turn-up testing, Neustar verifies that these dedicated connections and access requirements have been met before proceeding to production turn-up. Neustar's CCS team sits at the center of this process and coordinates all of these activities on behalf of the Service Provider. In our role as gatekeeper, we understand how systems interact with each other. An inexperienced vendor may not fully appreciate the need for MCRs as an example and even view them as unnecessarily burdensome to manage without realizing that ignoring this one facet of the setup process can later result in the User (and its clients, in the case of a service bureau) to lose connectivity with the NPAC/SMS for an extended period.

- **NPAC Profile Creation**—An NPAC profile is created to indicate which NPAC data elements and services the User supports. The profile indicates to the NPAC/SMS which optional data elements it should expect to be populated, such as the altSPID field, and which process options should be applied, such as timed intervals. Thus the User's profile plays a role in its interactions with the NPAC and in the data disseminated to other Users on its behalf. For the next term, we are proposing changes to the profile development process to focus on specific, hierarchical questions that apply to a Service Provider—for example, an LSMS-only SPID will not be offered SOA-related settings, etc. Also, in the future, NPAC Users will have the ability to review and submit profile forms online.

- **Application Certification Testing**—Neustar is responsible for ensuring vendors and SOA/LSMS users successfully complete Certification Testing before a system is allowed to connect to an NPAC production region. User systems are certified against interface and service functionality requirements and only upon successful certification testing is a user activated to receive NPAC services. Neustar functions as the gatekeeper for all LSMSs and SOAs, by testing the reliability and integrity of changes through a series of test cases.

- **Service Activation and Account Modification**—During this phase, a User is made aware of ways that Neustar can provide assistance in the future. NPAC profiles are configured and activated, and authorized contact lists are created or updated. A profile also is created for the automatic TN-lookup system (IVR). Profile and contact list updates are an ongoing activity as Users modify their interactions with the NPAC over time by either adding regions or requesting additional functionality.

1.1.2 Enforce Business Rules and Disseminate Data

An elementary aspect of the NPAC/SMS service is to broadcast data associated with a single telephone number (or a thousand block), as directed by Service Providers. The NPAC system itself was designed to seamlessly implement hundreds of business rules, the permutations and combinations of which can result in hundreds of millions of rule interactions on a daily basis. Proposal Section 1.2.2, System Functionality, provides greater detail on system capabilities.

The NPAC/SMS must be a highly-capable system, however, LNPA personnel are also critical to ensuring that business rules are followed when assisting NPAC Users.

- Access rights are determined by need to obtain data. Evaluating requests for access to NPAC data is a very deliberate process to ensure access to NPAC data is provided only to those that are eligible to have it.

- Neustar employees act as agents on behalf of carriers and process transactions. An intrinsic understanding of business rules is necessary to assist customers with determining what can be done and in what manner. A sample listing of various business rules is provided in Table 1.1-1 below:

Table 1.1-1. NPAC/SMS Business Rules

Business Rule	Underlying Requirements
[redacted]	
Creating Network Data	• NPA-NXX must be assigned to OCN associated with SPID opening the code • NPA-NXX-X must be broadcast when "pending" block is created • SPID must be valid OCN; otherwise, SPID assigned by NSR
[redacted]	

Without intimate knowledge of what the rules dictate and what the rules mean, i.e., their spirit, not just their letter, it would be very difficult, if not impossible, to troubleshoot data or porting issues.

- A dedicated team of individuals applies LNPA knowledge and expertise to determine what kinds of access Users ought to have and how they need to interact with the NPAC system. Leveraging our experience, we are able to assist non-expert applicants to demonstrate they are eligible to access User Data and to describe their intended use of the User Data sufficiently to enable our third party New User Evaluator (NUE) to determine whether the eligibility and Permitted Use eligibility imposed by the NAPM LLC are met. For example, an applicant offering VoIP service often misunderstands the need to distinguish between a VoIP provider acting as a node on the PSTN (i.e., Class 1 Interconnected VoIP provider) from a VoIP provider operating "behind" a PSTN switch node (a Class 2 Interconnected VoIP provider). The former is a Service Provider with full read/write privileges, the latter a "PTRS" with read-only privileges.

- Our dedicated provisioning team handles the majority of incoming transaction processing requests for the Industry. The team is able to walk the inexperienced User through provisioning data requirements and explain it from the User's perspective.

- Neustar's dedicated Service Management team is responsible for ensuring the integrity of process flows is maintained while monitoring the LNP ecosystem (consisting of the NPAC, SOA, and LSMSs) for anything that might impede or halt porting activities.

- A dedicated Industry Change Management Administrator works with the Industry to develop, modify, and maintain LNP business flows and works internally to ensure LNPA WG requests to modify the NPAC/SMS are conveyed clearly to developers.

- Detailed and thorough User Methods and Procedures (M&Ps) are maintained by the Neustar Project Executive (PE). These M&Ps are a quick-reference guide on all things involving the NPAC and are relied upon by Service Providers to understand interaction between various business rules.

1.1.3 Address User Support Needs

Tier 1 Support

Currently, User Support is multi-tiered and is available with agents staffing the Tier 1 Help Desk during Business Hours and available on-call thereafter. For the next term, our Tier 1 support team will operate 24x7x365 versus on call. Our Tier 1 support team is based out of Louisville, KY but some Tier 1 employees operate remotely further enhancing business continuity by ensuring that User support is not subject to the vagaries of the weather or events in any one region. Tier 2 and Tier 3 support personnel are based out of our Corporate Headquarters in Security-Related Information. The Tier 1 NPAC Help Desk is the central point of contact for all provisioning and trouble related requests of simple and complex nature. Reasons Service Providers contact us include, but are not limited to the following:

new

- Interface and connectivity issues

- LSMS and SOA issues

- Number portability inquiries

- Processing SV requests

- New SOA/LSMS turn-ups

- LTI GUI logon requests

Due to the proactive nature of our support service, most potential trouble conditions are noticed and addressed before they are noticed by the NPAC User. Thus, most Help Desk contacts concern provision requests rather than trouble reports. As shown in Exhibit 1.1-5 below (data for 2012), of the top 10 categories describing why customers called our Help Desk, the majority of the questions received are porting and provisioning related: activates, disconnects, modifies of telephone numbers, or questions on the LNP business flows, bulk data downloads and testing, etc.

n

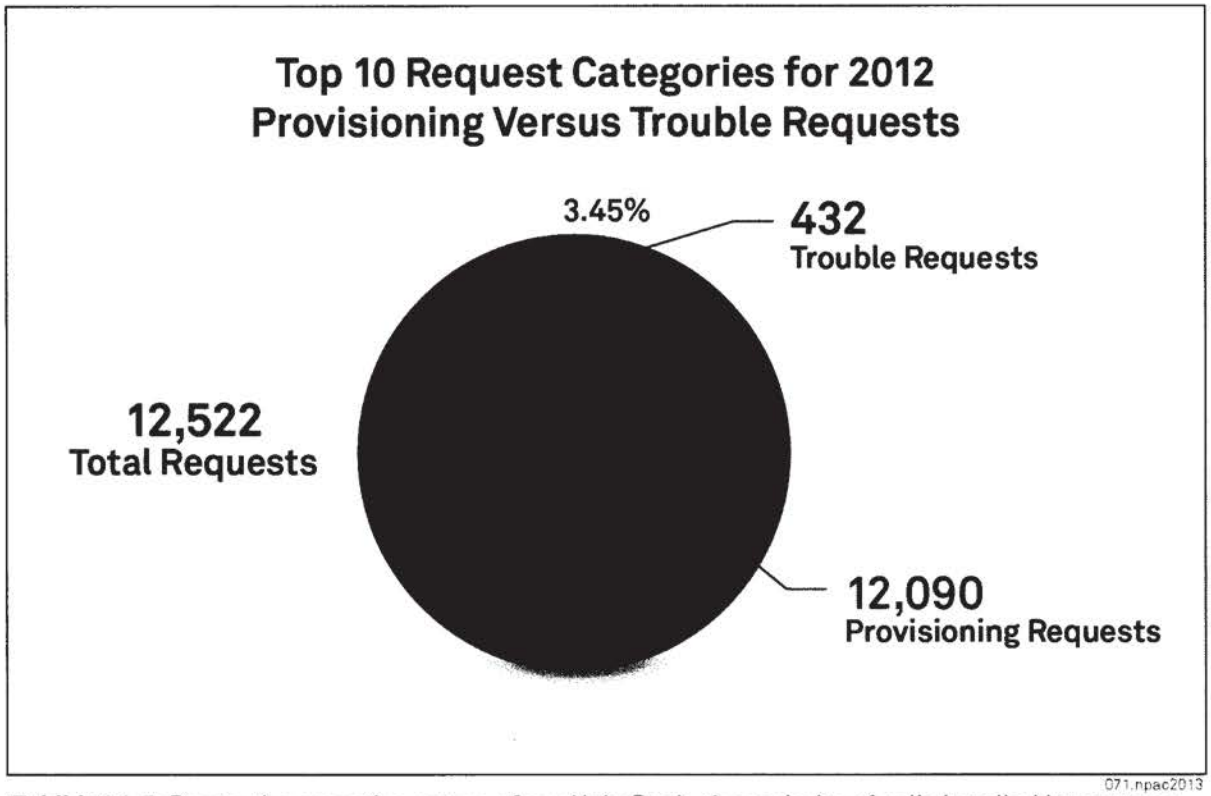

Exhibit 1.1-5: **Due to the proactive nature of our Help Desk, the majority of calls handled by our team are to assist customers with provisioning and porting activities.**

Authorized NPAC Users want the ability to access NPAC services and customer support experts by multiple channels. Such methods of communicating with the NPAC Customer Support team include phone, e-mail, and secure web portal via the NPAC.com. We are proposing the implementation of a "Chat with an Expert" option in the New NPAC Portal.

new

The ability to ask questions, submit various provisioning tasks for processing and obtain trouble resolution in a timely and accurate manner is often pivotal to the NPAC customer's success in providing LNP services to end users. NPAC customers want expert answers provided in a timely manner upon initial contact. Users want top quality, one-on-one, customer service and real-time 24x7x365 access to address LNP issues at any given time.

NPAC Users often use the Help Desk for SV Administration activities to create or correct NPA-NXX data once it becomes available for use. This task is important to help Service Providers manage their data. Specifically, data administration entails the following activities:

- Porting TNs and work with non-active and active SVs
- Managing NPA-NXXs, LRNs, and NPA-NXX-Xs and telephone number pool blocks
- Performing SV audits which are maintenance tasks used to troubleshoot SP problems and ensure data integrity

- Ensuring accuracy in processing manual billable requests
- Simplifying filter management for different types of customers at the NPA/NXX (6-digit) and NPA (3-digit) levels

End-user Support

In addition to supporting NPAC customers, we are often contacted by consumers (end users of Service Providers) requesting assistance to act as an intermediary. While not a contractual requirement, it is our belief that every query received by us deserves the same high-quality support regardless of whether the request originated from an NPAC User or not. As a recent example, we assisted one such consumer with a particularly difficult issue and helped resolve it to its logical conclusion. In response, one of our employees was recognized with the following accolade:

> "... I've had the pleasure of gaining the assistance from one of your staff members, Security-Related Information, in resolving a tough issue that I was unable to take care of on my own. In fact, without her persistence in following up for me, being a go between, I don't believe resolution would've ever been reached..... Although this process took several more days, the passing of lots of emails back and forth and follow up with many phone calls to different people on Jessica's part, she stayed with it right to the end... I am 100% convinced this wouldn't have happened without her!
>
> ...The kind of work ethic and professionalism that your staff member exhibited while assisting me is seldom seen these days. It deserves recognition."
>
> End user e-mail, 2013

The Neustar Difference

Our Tier 1 help desk operates at the level of a Tier 2 support center. Our team resolves approximately 80% of the questions on the **first call** without the need for additional troubleshooting. This high first-call resolution rate exceeds industry standards and saves NPAC Users significant time and expense, as the majority of issues are resolved right away. We can achieve this rate because the Tier 1 team has the necessary LNP knowledge and understanding of customer's LNP environments (which are serviced by multiple SOA/LSMS vendor systems) and can quickly determine solutions.

Neustar's ability to provide and process NPAC User requests accurately and in a timely manner is critical to preventing service interruption for NPAC Users. Any delay in processing requests can cause NPAC Users to miss system notifications. Overflow of unwanted notifications can bring a User's system down. LRN data errors due to delayed updates can cause service interruption to end users. Lack of understanding of NPAC business flows and timers can cause significant porting delays for NPAC Users. This ability to translate a customer's request into actionable items has meant that our personnel take approximately three minutes to address the majority of the calls that are received.

Our Tier 1 Help Desk team operates at the level of a Tier 2 support desk due to the investments that Neustar has made in training, monitoring systems, and tools provided to our Help Desk personnel. Our customers are the beneficiaries of this emphasis and results often times speak for themselves. As an example, only 0.36% of all tickets opened by our Tier 1 team were referred to Tier 2 (Applications Support) for assistance in 2012. No tickets were sent to our Tier 3 (Software Development) team.

> "I have never had to deal with anyone other than the Tier 1 support and they have always been great. Very friendly and helpful and they always get my problem fixed quickly."
>
> NPAC Survey 2011

Tier 2 Support

Neustar also makes available its **Tier 2 Application Support** team to further troubleshoot and resolve system issues and to deliver specific information requested by Service Providers. More specifically, our Tier 2 support team helps users with the following:

- Troubleshooting and resolving complex Service Provider connectivity and association issues
- Developing and generating Ad Hoc Reports for Service Providers based on their data requirements
- Automating the generation and delivery of daily Bulk Data Download (BDD) files and Delta BDD files for Service Providers

Our Tier 2 team is available on-call 24x7x365 to ensure timely responses. In addition, our support teams proactively monitor the NPAC system as well as porting activity to ensure optimal performance.

Tier 3 Support

NPAC Help Desk can assign tickets to the NPAC Development team for **Tier 3 Support** to help investigate and verify defects, evaluate the impact severity, and determine the appropriate course of action. Potential actions include:

- Identifying an alternative solution and schedule fix for a future point release;
- Building an emergency patch release containing a code fix; and
- Providing an explanation for system behavior.

Our Tier 3 team is available on-call 24x7x365 to work with the Help Desk and resolve any issues.

Contact List Administration

Neustar maintains several contact lists, shown in Table 1.1-2, which contain Service Provider contact information that can be used as a source directory to verify authorization of company personnel when dealing with a variety of issues, like port-in-error or failure-to-port conditions or when NPAC personnel have to initiate contact with a Service Provider organization to troubleshoot interface or connectivity issues.

Additionally, Service Providers use these lists to contact their counterparts in other companies as needed. Service Providers also have the ability to maintain and update these contact lists on the secure portion of the NPAC website.

Table 1.1-2. Service Provider Contact Lists

List	Description
Service Provider Primary Contact List	Individuals within a company authorized to contact the NPAC Help Desk and able to make changes to their company's Authorization List. The Primary Contact also has authorization to execute required documents, such as new User Applications and User Agreements.
Port in Error—Failure to Port Contact List	Individuals within a company able to authorize porting events when a Port-in-Error or Failure-to-Port condition exists. Should one SP encounter porting issues, it can use this contact list to reach out to counterparts to resolve issues and achieve faster resolution time for an end consumer who is affected.
Service Provider Courtesy Contact List	Key personnel able to troubleshoot interface problems and assist Mechanized customers with resolving Application Interface issues. NPAC personnel initiate contact with a Service Provider when their LSMS or SOA system is not associated with the NPAC.

1.1.4 Provide Industry Training

The LNPA offers classroom training on the use of the NPAC UI (the LTI and to be known as the "NPAC Portal") either on-site at Neustar, off-site at the customer's location, or virtually. This training is shown in Table 1.1-3:

Table 1.1-3. LNP Training Modules

Topic	Description
[redacted]	

In compliance with the RFP, formal training will be expanded to include training on:

new

- Uploading ported/pooled TN data and User Data
- Receiving and understanding broadcasts
- Receiving and understanding error/success messages
- Requesting, receiving, and understanding mass changes
- Requesting, receiving, and understanding reports (including billing)
- Understanding security and encryption measures

Further, in the next term, we will offer online training modules via the new NPAC Portal on LNP 101 and on utilizing NPAC functionality.

In addition to continuing to offer in person/class room training, we will provide these training components in a modular format online to allow carrier personnel to learn about LNP and the NPAC at their own convenience and pace.

1.1.5 Support Industry Testing

Testing with the NPAC is critical to ensure Service Provider systems properly interface with the NPAC. Test cases are implemented to ensure new and existing NPAC functionality is not adversely impacted thereby allowing uninterrupted porting. Testing is required whenever new Service Providers join the LNP ecosystem, when a new NPAC software release is implemented, and when the Service Providers or the NPAC modify or upgrade their systems.

Neustar currently offers two test platforms so that Service Providers and their vendors can perform:

- Testing of their systems with the current production NPAC/SMS software release
- Testing of new NPAC/SMS software releases prior to the release being implemented in the NPAC Production Regions

The Test Platforms are available for testing 24x7x365. An Application Engineer is available during normal business hours (Monday – Friday; 9am – 7pm ET) to assist Service Providers and their vendors with their testing needs, for example to perform key exchanges, generate bulk data downloads, administer filter management, create network data, and execute NPAC functionality test cases. In 2012 alone, Neustar's Application Engineers provided over 4,200 hours of testing support in response to requests from Service Providers and their vendors for ad-hoc testing requests, dedicated testing for SOAs and LSMS, etc.

Neustar hosts a monthly Industry Testing Conference Call for Service Providers and vendors as well as a weekly conference call during Certification Turn-up Testing for a new NPAC/SMS software release. These testing conference calls provide an opportunity for Services Providers and vendors to receive information regarding NPAC software releases. The calls provide a forum for questions and concerns that are addressed by our experienced staff of customer support and application engineering personnel.

Types of Testing Neustar Supports:

Table 1.1-4 shows the types of testing vendors and Service Providers perform with the NPAC/SMS Test Platforms:

Table 1.1-4. Types of Testing Supported by Neustar

Testing	Description
[redacted]	
Regression Testing	When the NPAC/SMS system changes or when a Vendor's and Service Provider's system changes, Vendors and Service Providers must perform Regression Testing to ensure any changes have not introduced issues that could negatively impact NPAC/SMS performance. • Regression Testing for **SOA - 130 test cases**; **LSMS- 70 test cases**
[redacted]	
Certification Testing Support	Certification Turn-up Testing is performed on a supported basis, i.e. Vendors and Service Providers test one-on-one with an NPAC Test Engineer creating network data for the test cases, executing NPAC functionality test cases, and ensuring the Vendor and Service Provider systems interact properly with the NPAC/SMS.
[redacted]	

Testing	Description
[redacted]	

The Neustar Difference

Neustar has been providing and supporting the NPAC/SMS Industry Test Platform for 10 years. As shown in Exhibit 1.1-6 the functional knowledge, expertise, and support our engineers provide to Service Providers and their vendors are evident in the Annual NPAC Performance Feedback Survey.

In an effort to better serve our customers we will make available an enhanced testing capability which will allow scripted results and responses. Customers will have the option to use the existing Industry NPAC test beds as well as the enhanced capabilities. The enhanced testing capability will offer:

- **Added flexibility** as service providers can test outside the normal Industry testing windows and configure their own reference data as needed. For example, if a Service Provider is implementing a new billing system, and wants to test NPAC functionality as part regression/progression testing, then it will have the option to use the new testing capability to run specific test cases according to its schedule and business requirements.

- **Enhanced automated testing** so that Service Providers will be able to implement regression testing and new NPAC functionality testing scenarios to generate NPAC/SMS responses and broadcast to test with their "downstream" systems and processes. This will enable Vendors and Service Providers to self-certify Turn-up Testing. NPAC Test Engineers will review Turn-up Testing test case results and logs to confirm that Vendor and Service Provider systems interact successfully with both the NPAC/SMS current and new software releases.

NPAC User Survey
New Services Rollout – NPAC Testing Services

Attribute	2011 Score	2012 Score	Trend
Test Engineer Knowledge	3.7	3.8	▲
Test Engineer Responsiveness	3.7	3.8	▲
Test Engineer Communication Skills	3.7	3.8	▲
Test Engineer Responsiveness to Issues	3.7	3.8	▲
Test Environment Availability for Scheduled Turn-up, Group, and Failover Testing	3.7	3.8	▲
Test Engineer Successfully Managed Testing Time: Turn-up Testing	3.8	3.8	⟷
Test Engineer Successfully Managed Testing Time: Group and Failover Testing	3.7	3.8	▲

>3.4 - Strength 3.0–3.4 - Currently Acceptable <3.0 - Needs Improvement

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Exhibit 1.1-6: Neustar continues to provide superior testing services to the Industry to ensure all components of the LNP ecosystem interact in a coordinated manner as designed.

1.1.6 Administer the Industry Change Management Process

As the LNPA, Neustar has been responsible for providing the Industry with expert Change Management Administration (CMA) since 1997. This function requires the Neustar team to have a deep understanding of the domain, ask thought-provoking technical and operational questions, have a long historical understanding of previous changes, and properly manage and maintain all inter-related change order documentation via an Industry-approved process (see Exhibit 1.1-7). Neustar views this function not just as an administrative one to manage NPAC/SMS functional and technical changes desired by the LNP Industry, but thoroughly considers the impacts to multiple parties, eventually guiding the change order discussion towards a solution viable for the entire Industry. This need to find the right balance between being proficient (in an administrative capacity) and inappropriately influencing the process (as the SME of all change orders), is an intangible skill that comes only with experience.

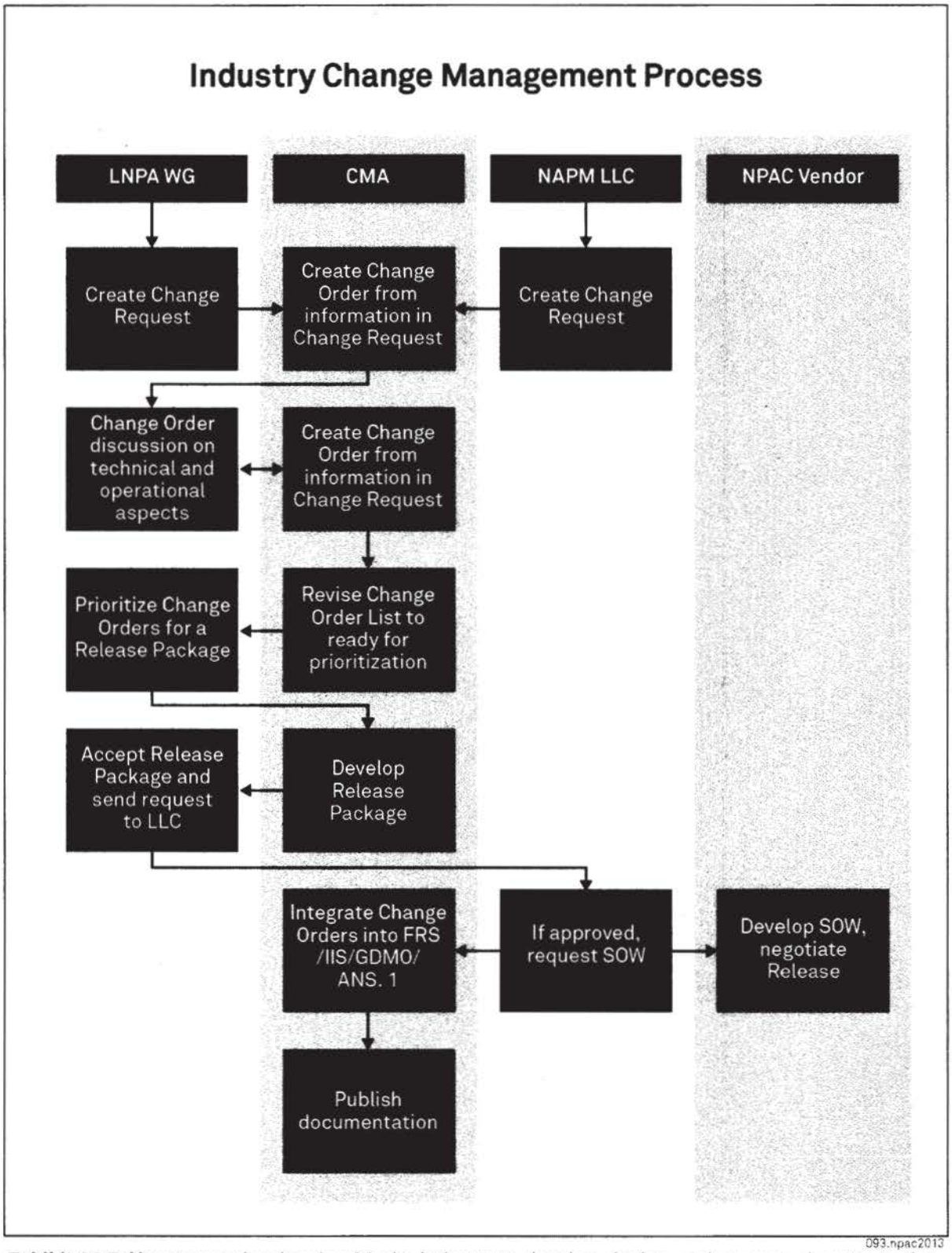

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Exhibit 1.1-7: **Neustar works closely with the Industry to develop, design, and manage changes to the NPAC/SMS.**

From a functional standpoint, Neustar:

- Manages change order documentation, including writing the Business Case Need and High-Level Description of Change, assessing requirements/message impacts (requirements in the FRS, message flows and attributes in the IIS, and message structures in the GDMO, ASN.1, and Security-Re), and tracking and documenting the Industry discussion including Q&A from initial business need through high-level definition, analysis, design, and implementation.

- Coordinates change order prioritization for NPAC SMS Software Release packages in a neutral manner, including a deep-level understanding of the requested functionality in order to thoroughly explain change orders that allow knowledge-based Industry voting, maintain service provider voting guidelines, compile the results of secret voting, and determine Software Release package sizing and package content in order to manage the combination of scope and delivery timeframe.

- Updates Industry documentation, including FRS (narrative description and detailed requirements), IIS (message flow graphics showing message requests/responses and applicable attributes in those messages), GDMO (technical managed object and attribute definitions), ASN.1 (technical message notation and definition), Security-Re (schema definition) and testing documents (full comprehensive and specific release Test Plans and Test Cases).

- Serves as a liaison between the Industry and NPAC Development and Operational Teams, to facilitate Q&A on issues that arise during the analysis and/or design phases.

- Mediates functionality/testing issues between the NPAC Testing Team and SP/Vendor Testing Teams.

The Neustar Difference

As CMA, Neustar has successfully **managed 452 NANC change orders** and well over **100 Illinois change orders**. We have been able to do this because we are:

1. **Trusted by the Industry**—over the years, we have worked to earn Industry's respect and confidence that we are serving the entire Industry fairly and impartially—critical to the overall efficacy of the CMA role and function.

2. **Experienced**—In LNP Administration, Industry needs, and possesses a historical knowledge of the first days of number portability in this country. This enables us to answer questions accurately and quickly which results in the Industry being able to make more informed decisions and maximize productivity at working meetings reducing travel expense and realizing improvements to the NPAC service or processes more quickly.

> "As someone who assists the LNPA-WG with the Industry Best Practice Document, I rely on Neustar for assistance..... Neustar, Security-Related Information and Security-Related Information specifically, have been phenomenal people to work with in terms of partnership and customer service. I wish other vendors would learn from Neustar's dedication to customer assistance."
>
> NPAC survey 2008-2009

1.1.7 Validate Information for Law Enforcement Agencies and Telemarketers

The introduction of Number Portability has provided significant benefits to consumers in the form of increased competition, and market efficiency, but also has introduced additional complexities surrounding public policy. By virtue of the ubiquitous nature of phone numbers and the fact that dialed digits no longer can be used to reliably identify a subscriber's service type or provider. Two examples of this impact involve the prohibition on using automatic dialing systems/pre-recorded voices to target wireless consumers and law enforcement's investigative process.

In response to these developments and in partnership with the NAPM LLC, Neustar developed the following applications:

- **Intermodal Ported Telephone Number Identification (IPTN) service**—Inter-modal porting is one of the key benefits offered to U.S. consumers via the NPAC, and millions of subscribers have taken advantage of it. The IPTN service delivers, on a daily basis, a comprehensive file of telephone numbers and telephone number ranges that have transferred from fixed line service providers to wireless ones, and vice versa. This makes it possible for telemarketers and credit/collections agencies to quickly and reliably provision their systems complying with the Telephone Consumer Protections Act (penalties for violations of the TCPA can be over $11,000 per incident).

- **Local Number Portability Enhanced Analytical Platform (LEAP)**—The LEAP service is designed for law enforcement agencies, public safety dispatch personnel, and authorized supporting organizations to facilitate authorized access to portability data in an environment where time is often of the essence. The service operates via both an online web-based GUI and an Security-Related Info accessed over a virtual private network. It permits qualified customers to submit a telephone number (or a list of up to 100 numbers), and receive a limited subset of NPAC information associated with those numbers—namely the identity and contact information for the controlling network service provider and (if available) for the reseller or alternative service provider. Security-Related Information

  Today, over 100 qualified customers, at the federal, state, and local levels rely on the LEAP service as the exclusive mechanism to obtain telephone number data.

Both of these applications are designed to make a subset of NPAC data accessible to specific constituencies and for limited and strictly-defined purposes—namely to comply with federal regulations and support the investigative and public safety process. Security-Related Information

[redacted]

Operation of these two platforms goes beyond technical administration. In providing these services to these constituencies, Neustar, as the LNPA, acts as a steward and ambassador of the NAPM's objectives and priorities. We do so via the ongoing enforcement of data restrictions on LEAP and IPTN customers, actively ensuring the strict confidentiality of LNP data, and addressing customer questions and concerns regarding functionality and policy. We have cultivated strong relationships with these communities by providing excellent service, being a reliable resource for, and by effectively communicating the requirements of the NAPM LLC with regard to these services. In all the time we have been operating them, there has not been a single complaint raised to the NAPM or the FCC regarding our fairness or our performance. In addition, Neustar has satisfied all internal and customer audits with regard to these services since their inception.

In spring of 2012 Neustar conducted a survey of LEAP customers, and found that 94% of agencies found that the service met or exceeded their expectations. Here's what else some of the customers had to say about LEAP:

> "...allows us to off-load the tedious task of determining ownership in a "porting" world."
>
> "Getting the wrong information about a particular telephone number could hamper or even stop a successful investigation in its tracks."
>
> LEAP Survey 2012

Neustar will continue to work with IPTN and LEAP customers, in partnership with the NAPM LLC, to improve the services. For the next term, we propose:

- A "push" mechanism for IPTN, permitting the system to affirmatively notify customers of intermodal ports when they happen, as opposed to waiting for a file download
- Mobile/Smartphone versions of LEAP to permit remote access for field personnel to augment the capabilities of the NPAC IVR.

1.1.8 Provision LNP Orders

Provisioning LNP orders on behalf of customers in an accurate and secure manner is an important function of the LNPA.

Further, to avoid any negative ramifications of an incorrect porting activity and to assist users to make informed choices, it is important to fully understand the LNP business flows to accurately translate the request. Neustar's team of provisioning experts is responsible for coordinating, managing, and processing requests from Service Providers and the Pooling Administration System (PAS). A focus on automation has meant that our team provisions customer requests with over 99.9% accuracy.

Specifically, the team has and will continue to process the following LNP requests:

- Creates
- Activates
- Modifies
- Deletes
- Mass update / mass port requests
- SPID migration activities
- NPA splits

Pooled Block Management

The purpose of the NPAC Pool Block Process is to receive requests from either the customer or the Pooling Administration System (PAS), validate the same, and then schedule their execution in the NPAC/SMS so as to disseminate network routing and other information on behalf of Neustar customers.

Neustar Users that also utilize PAS may enter the Pool Block requests directly into the PAS or may send their requests to the Neustar provisioning team for processing activations, modifications, or deletions. Information is disseminated in "blocks" of telephone numbers—a series of telephone numbers grouped in thousand-number parcels known as "Pool Blocks." Pool Blocks are identified using the first 7 digits of a 10-digit telephone number—the NPA-NXX-X. A series of 1,000 telephone numbers is assigned sequentially to that block where the last digit in the unique 7-digit sequence is the 1st number of the 1,000 telephone number sequence, i.e., NPA-NXX-X000 to NPA-NXX-X999. Changes to the Pool Blocks (activations, deletions, modifications) are distributed simultaneously to LSMS operators in a specific U.S. Region to update their systems with the new Pool Block arrangements.

Neustar's provisioning team works very closely with the Pooling Administrator and NANPA to help customers work and resolve complex Pooling request and provisioning issues. As the LNPA, PA, and NANPA, Neustar is well-versed in the rules and applicability of the same and manages this process on behalf of our customers in an effective and efficient manner. For example, our dedicated team of experts understands that the NPAC should accept requests only from a provider for block creation and activation when the requesting SPID is the code holder. In cases where the requested block is for an NPA-NXX that is not yet opened in the NPAC, or where the referenced LRN does not yet exist, our team knows to monitor the situation on a daily basis and wait for the necessary objects to be created in the NPAC without rushing to complete a job assigned.

As numbers are ported, some fail to flow through the automated process. These are known as fallout and can negatively impact Service Provider costs by increasing the time it takes to port and adds to customer acquisition time and costs. Neustar works with Service Providers to get fallout corrected and processed as needed, to avoid occurrences where a Service Provider is updating PAS with information that is not needed or already is populated in the NPAC. Due to the diligence of our teams, less than 0.1% of pooled block requests are rejected by PAS—i.e. fallout is minimized. We take these lessons learned and work with the PA to add checks and balances to their processes or systems to prevent reoccurrence in the future.