Final Report and Recommendations of the North American Numbering Council

Report on Direct Access to Numbers by Interconnected Voice over Internet Protocol (VoIP) Providers

NANC Call Authentication Trust Anchor Working Group

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Report on Direct Access to Numbers by Interconnected Voice over Internet Protocol (VoIP) Providers

1. Introduction

Fighting illegal robocalls is a top consumer protection priority for the Federal Communications Commission (FCC), and call authentication is an important part of solving this critical challenge. With the passage of the Pallone-Thune Telephone Robocall Abuse Criminal Enforcement and Deterrence (TRACED) Act, Congress expressed its support for a robust call authentication system.[1]

The FCC's Wireline Competition Bureau has called upon the North American Numbering Council's (NANC) Call Authentication Trust Anchor (CATA) Working Group (WG) to report on the strength of the Commission's rules governing the process for direct access to numbers by interconnected voice over Internet Protocol (VoIP) providers in order to help stem the tide of illegal robocalls, protect national security and law enforcement, safeguard the nation's finite numbering resources, reduce the opportunity for regulatory arbitrage, and further promote public safety. Specifically, they directed the NANC to address the following:

- the use of numbers obtained on the secondary market in the United States;
- the use of U.S. North American Numbering Plan (NANP) numbers for calls that originate abroad and terminate in the U.S. market;
- the specific number usage restrictions already in place abroad, and on the likely effect of similar Commission action on providers, consumers, businesses, and illegal robocallers;
- the practice of direct access authorization holders supplying telephone numbers to customers on a trial basis;
- the use of such "trial basis" numbers to engage in illegal robocalling, spoofing, or fraud;
- the potential effect on direct access authorization holders in the event of a Commission prohibition on providing numbers on a trial basis; and
- the effect of supplying telephone numbers to customers on a trial basis on numbering resource exhaust.

[1] Pallone-Thune Telephone Robocall Abuse Criminal Enforcement and Deterrence Act, S. 151, 116th Cong., § 4(b)(l) (2019) (TRACED Act).

2. Report

2.1. Background

Access to numbering resources is a critical element in the telecommunications industry, enabling the assignment of unique telephone numbers to service providers. The process is governed by the 1996 federal Telecommunications Act[2] (the 1996 Act) and a detailed FCC framework of rules, standards, guidelines, and procedures designed to ensure efficient management and allocation of these limited resources. Below is an overview of the current process and rules related to numbering resources.

2.1.1. Numbering Authority and Oversight Pursuant to the 1996 Act

The 1996 Act provided the FCC with exclusive jurisdiction over NANP numbering resources and permitted it to delegate portions of that jurisdiction to the State commissions:

> (e) NUMBERING ADMINISTRATION - (1) COMMISSION AUTHORITY AND JURISDICTION - The Commission shall create or designate one or more impartial entities to administer telecommunications numbering and to make such numbers available on an equitable basis. The Commission shall have exclusive jurisdiction over those portions of the North American Numbering Plan that pertain to the United States. Nothing in this paragraph shall preclude the Commission from delegating to State commissions or other entities all or any portion of such jurisdiction.[3]

The 1996 Act allowed Telecommunications Carriers to apply for direct access to NANP numbering resources. It defines Telecommunications as "the transmission, between or among points specified by the user, of information of the user's choosing, without change in the form or content of the information as sent and received."[4] Telecommunications Carrier means "any provider of telecommunications services, except that such term does not include aggregators of telecommunications services (as defined in section 226).[5] A telecommunications carrier shall be treated as a common carrier under this Act only to the extent that it is engaged in providing telecommunications services, except that the Commission shall determine whether the provision of fixed and mobile satellite service shall be treated as common carriage."[6]

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[2] 47 U.S.C. §151, *et. seq.*

[3] 47 U.S.C. §251(e)(1).

[4] 47 U.S.C. §153(50).

[5] 47 U.S.C. §226(a)(2) defines "aggregator" as "any person that, in the ordinary course of its operations, makes telephones available to the public or to transient users of its premises, for interstate telephone calls using a provider of operator services."

[6] 47 U.S.C. §153(51).

2.1.2. Regulatory Requirements for Direct Access to Numbers

Section 52.15(g) of the Commission's rules governs applications for numbering resources. Direct access to numbers is limited to entities that demonstrate they are authorized to provide service in the area for which they are requesting numbers.[7] The FCC has interpreted this to require evidence of either a state certificate of public convenience and necessity or a Commission license or authorization. Prior to 2015, only Telecommunications Carriers were able to provide this proof of authorization, so the Commission revised its numbering rules and adopted a separate process to allow interconnected VoIP providers to obtain authorization to request numbers directly from the Numbering Administrators.[8]

First, the Commission expressly conditioned direct access to interconnected VoIP providers on compliance with the same requirements applicable to Telecommunications Carriers seeking to obtain numbers. Namely, interconnected VoIP providers were required to comply with state requirements pursuant to numbering authority delegated to the states, industry guidelines and practices, facilities readiness requirements and numbering utilization and optimization requirements.[9]

Second, the Commission ordered that interconnected VoIP providers (1) provide state commissions with regulatory and numbering contacts when requesting numbers in states; (2) request numbers from the Numbering Administrators with their own Operating Company Number (OCN); (3) file requests for numbers with the state commissions at least 30 days prior to requesting numbers from the Numbering Administrators; and (4) provide customers with the opportunity to access all abbreviated dialing codes (N11 numbers) in use in the geographic area.[10]

Third, the FCC implemented an authorization process for interconnected VoIP providers, including requiring certification that the provider complies with its Universal Service Fund (USF) contribution obligations, Telecommunications Relay Service (TRS) contribution obligations, NANP and local number portability (LNP) administration contribution obligations, obligations to pay regulatory fees and 911 obligations. The Commission also required interconnected VoIP providers to certify that the applicant has the technical, managerial and financial capacity to provide service, including names of key management and technical personnel, and state that none of the identified personnel are being or have been investigated by the Commission or any law enforcement or regulatory agency for failure to comply with any law, rule or order.[11]

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[7] 47 C.F.R. §52.15(g)(2).

[8] Report and Order, *In the Matter of Numbering Policies for Modern Communications*, WC Docket No. 13-97 (rel. June 22, 2015) (Direct Access Order).

[9] *Id.*, at ¶13, ¶24 and ¶27.

[10] *Id.*, at ¶14; see also 47 C.F.R. §52.15(g)(3)(x).

[11] *Id.*, at ¶24 and 47 C.F.R. §52.15(g).

Throughout its Order, the Commission emphasized that its decision was intended, in part, to enable greater visibility into the use of telephone numbers and enforcement of its numbering rules and policies against interconnected VoIP providers. For instance, the Commission stated that permitting interconnected VoIP providers direct access to numbers would "increase visibility and accuracy of number utilization, enabling the Commission to more effectively protect the Nation's finite numbering resources. Our authorization process also enhances our ability to enforce the rules against interconnected VoIP providers."[12] The Commission also highlighted that its Order enforced policy goals of counteracting number exhaust, ensuring continuance of efficient number utilization and providing adequate safeguards to prevent bad actors from gaining direct access to numbers.[13]

Accordingly, the Commission reminded interconnected VoIP providers that failure to comply with industry guidelines and Commission rules regarding numbering resources could result in revocation of authorization, the inability to obtain additional numbers pending revocation, reclamation of unassigned numbers already obtained directly from the Numbering Administrators, or enforcement action. The Commission delegated authority to the Wireline Competition and Enforcement Bureaus to order the revocation of authorization and direct the Numbering Administrators to reclaim any of a service provider's unassigned numbers.[14] Providers are also subject to for cause and random numbering audits overseen by the Enforcement Bureau to verify compliance with Commission regulations and applicable industry guidelines relating to numbering administration.[15]

2.1.3. Process to Obtain Numbering Resources

2.1.3.1. Obtain an Operating Company Number (OCN)

The National Exchange Carrier Association (NECA) assigns company codes, also known as Operating Company Numbers (OCNs), based on the ATIS-0300251.2020 Structure for the Representation of Service Providers for Information Exchange guidelines and the North American Company Code Assignment procedures. These company codes are essential identifiers used in the management and reporting of numbering resources.[16]

To request an OCN, applicants must select the correct telecommunications service category that corresponds to their business. The numbering-related categories include:

- Incumbent Local Exchange Carrier (ILEC)

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[12] *Id.*, at ¶2; see also ¶16.
[13] *Id.*, at ¶22.
[14] *Id.*, at ¶53. See also 47 C.F.R. §52.15(g)(3)(viii), (ix) and §52.15(g)(5).
[15] 47 C.F.R. §52.15(k).
[16] https://www.neca.org/business-solutions/company-codes

- Regional Bell Operating Company (RBOC)
- Competitive Local Exchange Carrier (CLEC)
- Personal Communications Service (PCS)
- Unbundled Local Exchange Carrier (ULEC)
- Wireless Carriers (WIRE)
- Internet Provider Enabled Services (IPES) For purposes of NECA, IPES includes interconnected VoIP providers

Local Exchange Carriers (LECs) that operate in multiple states are assigned one OCN per category, per legal entity, per state, along with an overall code. Meanwhile, IPES, PCS, and wireless providers receive a single nationwide company code.

2.1.3.2. Request numbering resources

There are different types of numbering resources that service providers can request, including central office codes of 10,000 numbers (CO codes) or thousands-blocks of 1,000 numbers. In each, service providers can request initial resources in newly supported areas, or growth resources in areas they already serve. Central office codes can be assigned in rate centers that are pooled (offer thousands-blocks instead of an entire code) versus non-pooled rate centers (a service provider must take the full CO code of 10,000 numbers).

Numbering applicants must submit specific legal documents to demonstrate their eligibility for numbering resources:

- Articles of incorporation or equivalent documentation proving the company's legal existence.
- CLECs, ILECs, and ULECs must submit a state public utilities commission certificate.
- IPES must provide interconnection agreements, customer contracts, and proof of having received an FCC waiver.
- Wireless and PCS must submit an FCC radio or PCS license.

2.1.4. Utilization of numbering resources and NRUF reporting overview

The FCC requires all service providers who receive numbering resources to submit utilization and forecast data to the North America Numbering Plan Administrator (NANPA) as part of their Numbering Resource Utilization and Forecast (NRUF) reporting obligations. These reports ensure that numbering resources are managed efficiently and that there is transparency in the use and demand for numbers across the industry. NRUF reports are required to be filed semi-annually,

with two key deadlines each year: February 1 for the reporting period ending on December 31, and August 1 for the reporting period ending on June 30.[17]

With launch of the new combined NANP Administration System (NAS) in October 2024, service providers now have three options for submitting their NRUF reports; through the NAS online system, via secure FTP, or via REST API. After submission, service providers receive email confirmations.

For ported out numbers, the original (or porting-out) carrier who is the block holder (or the code holder if the code is non-pooled) must classify the number as "Assigned."[18] The receiving (or porting-in) carrier does not count these ported in numbers on their NRUF reports. Similarly, for resold services provided to end users, the block holder/code holder counts the numbers as "Assigned," and the receiving carrier is not required to include them in their reporting.[19] These numbers are not considered intermediate, as they are already assigned to end users and cannot be reassigned.

“Assigned Numbers” are defined as “numbers working in the Public Switched Telephone Network under an agreement such as a contract or tariff at the request of specific end users or customers for their use, or numbers not yet working but having a customer service order pending. Numbers that are not yet working and have a service order pending for more than five days shall not be classified as assigned numbers.”[20] Additionally, for numbers not yet assigned to an end-user customer, “Intermediate Numbers” are those obtained from or given to another carrier or non-carrier entity for future assignment.[21] Unassigned numbers provided by service providers with direct access to numbers to carriers, interconnected VoIP providers, or other non-carrier entities should be reported as intermediate and do not qualify as ”end users” or ”customers” as those terms are used in the definition of assigned numbers until they are ultimately assigned to end users.[22] Service providers must identify the carriers or interconnected VoIP providers to whom they have assigned blocks of numbers within their NRUF reports. According to the industry guidelines,[23] code or thousands-block holders reporting Intermediate Numbers must provide the contact information of the service providers that received the numbers. Those providers are then

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[17] North American Numbering Plan Numbering Resource Utilization/Forecast (NRUF) Reporting Guidelines, ATIS-0300068 (October 28, 2024) at 6.1.

[18] *Id.* at 6.2; 47 C.F.R. §52.15(f)(1)(v).

[19] Numbering Resource Utilization/Forecast (NRUF) Form 502 Job Aid (Reporting Geographic Utilization and Forecast Data (Ver. 1.0 October 28, 2024) at 2.2.2.

[20] 47 C.F.R. §52.15(f)(1)(iii).

[21] *Id.*, at §52.15(f)(1)(v).

[22] Direct Access Order at ¶32.

[23] Thousands-Block (NPA-NXX-X) & Central Office Codes (NPA-NXX) Administration Guidelines, ATIS-0300119 (November 2024).

responsible for submitting their own NRUF to provide the number utilization data on those Intermediate Numbers.[24]

Additionally, service providers are required to submit an Appendix 4 to the NANPA on a semi-annual basis, by the same February 1 and August 1 deadlines. This appendix forecasts the provider's expected needs for thousands-blocks and central office (CO) codes, by rate center, for the next 12 months, broken down by month.[25] The NANPA uses these forecasts to size each industry's inventory pool, maintaining no more than a six-month inventory of telephone numbers per rate center, unless donations or returns create an excess supply.

2.2. The use of numbers obtained on the secondary market in the United States

2.2.1. Secondary Market definition

The secondary market refers to the acquisition of telephone numbers from a service provider with direct access to numbers by a carrier or other communications provider in support of resale service offerings. [26]

The definition in the Secondary Report and Order is sufficient, but perhaps too succinct in that the reality of the secondary market is that it is large, layered, and complex. Numbers may be sold, resold, released, and resold again through layers of resellers. The resellers compete with rates, terms, and conditions for number sale and disconnects, and have independent inventory management processes, and proprietary Application Programming Interfaces (APIs) for acquiring, releasing, and reselling telephone numbers.

2.2.2. Insight into the Issue of Large Quantities of Numbers

2.2.2.1. Large Quantities of Numbers used by Robocallers

State Attorneys General (AGOs) engaged in investigations of illegal robocalling, fraud and other scams utilizing the communications network have observed the emergence of issues with numbering practices after implementation/deployment of STIR/SHAKEN. Implementation of STIR/SHAKEN and the need for numbers to be authenticated and properly attested is, at least in part, what appears to have led to an approach to numbering resources that has given rise to what

[24] *Id.*, at 4.4.3

[25] *Id.*, at 4.5.3 – 4.5.5

[26] Second Report and Order and Second Further Notice of Proposed Rulemaking, *In the Matter of Implementation of the TRACED Act Section 6(a) – Knowledge of Customers by Entities with Access to Numbering Resources*, WC Docket No. 20-67 (rel. Sep. 22, 2023) (Second Report and Order) at ¶71, footnote 239 ("Numbers obtained on the secondary market would include, e.g., numbers obtained from a reseller or a carrier partner.").

State AGOs are seeing as a new expansive demand for numbering resources. Bad actors have moved from spoofing numbers to rotating and "dumping" actual numbers.

In their investigative work in the last few years, State AGOs have observed a variety of nontraditional uses of numbers to further illegal robocalling and other scams using the communications network. An example is the bad actor using one outbound call per telephone number in large scale calling campaigns. This is often referred to as "snowshoeing", Automatic Number Identification (ANI) rotation, or "dynamic caller ID."

These terms refer to the practice of using large quantities of unique calling numbers on a short-term or rotating basis to evade behavioral analytics detection, or to bypass or hinder call blocking or call labeling analytics based on the originating numbers.[27] Numbers used for these practices are often numbers that cannot receive incoming calls. This technique of using a calling number only a handful of times to avoid detection by call blocking analytics prevents large providers and legitimate companies from identifying and blocking the phone numbers the bad actors are using to perpetrate scam calls.

Some voice service providers advertise the rotation of numbers as a service to enable callers to circumvent analytics that label calls as "spam" or similar labels and give the caller a better opportunity to reach a called party who will answer the call.[28]

One example of telemarketers abusing these practices to circumvent call analytics is a North Carolina AGO enforcement action where the defendant sent more than 17.3 million calls on a single day across only one of its 18 downstream providers. Of the 4.4 million calls that were answered, the average calls-per-number was 1.08, meaning that almost every recipient received a call from a distinct calling number. In this same case, one downstream provider of the defendant routed 3.4 million calls, almost 3.2 million of which used a different calling number, so that each calling number was used to make only 1.07 calls. Another of the defendant's downstream providers routed 11.6 million calls using 7.9 million different calling numbers, so that each calling number was used to make only 1.53 calls. Finally, another downstream provider routed 42.7 million calls using 23.4 million different calling numbers, so that each calling number was used to make only 1.84 calls.[29]

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[27] See https://www.bandwidth.com/glossary/snowshoeing/#; 3/25/2024 NCLC and epic.org Ex Parte, WC Docket Nos. 13-97, 07-243, 20-67 at 1-5.

[28] See, e.g., https://www.unitedworldtelecom.com/learn/what-is-a-dynamic-caller-id-for-voip/, https://www.convoso.com/blog/phone-number-marked-as-spam/

[29] *See* Complaint for Injunctive Relief and Civil Penalties, North Carolina ex rel. Stein v. Articul8, LLC & Paul K. Talbot, Case No. 1:22-cv-00058 (M.D.N.C. Jan. 25, 2022).

2.2.2.2. Large Quantities of Numbers used by Enterprises

Defining "large" in the enterprise context is somewhat arbitrary. Some large enterprises may control more than 100,000 numbers, but how much number rotation is used within those numbers is not known. A much smaller enterprise might acquire only 100 numbers, use them in a number rotation dial plan and then release them when metrics indicate call completion is eroding. Those 100 numbers can be released and another set obtained, and the process can repeat, potentially automatically.

Telephone number resale is unregulated with respect to pricing. Cost is a consideration, and numbers acquired from service providers with direct access could be less expensive in theory, but the assignment, release, and disconnect costs might be prohibitive or more cumbersome in terms of contract terms and number assignment Application Programming Interface (API) requirements that could contribute to a greater reliance on numbers available via the Secondary Market. Note that there is no standard API for number assignment, release, etc. Such APIs are often reseller-specific.

Telephone number resellers also exist who have no facilities. Service providers and enterprises looking to ensure inventory and minimize cost may acquire, use, release, and re-acquire numbers from multiple sources, and change sources often. And resellers can sell to other resellers, which further obscures visibility into the ultimate use of numbers. This complex, layered environment impacts the quality and perhaps ability to do NRUF reporting as is mentioned elsewhere.

Even without defining "large" assignments of numbers and identifying how much of the activity occurs amongst service providers with direct access to telephone numbers as compared to the Secondary Market, it seems clear that these practices are common.

According to a recent Hiya survey of 300 business leaders in the U.S., 80% of U.S. businesses rotate their phone numbers and 60% rotate at least weekly. Clearly, large assignments of telephone numbers and number rotation is not confined to illegal robocallers and prohibitions on the assignments and dialing practices would impact many legitimate businesses.[30]

One important reason legitimate callers may acquire large quantities of telephone numbers and use number rotation dialing practices is the perception, fueled by call completion metrics, that anti-robocalling analytics are accidentally labeling and blocking their calls to their customers and that number rotation is an effective and warranted countermeasure.

Analytics providers are not complacent about the problem of number rotation or the perception that labeling and blocking with analytics are the primary cause. Some analytics providers operate large complex analytics systems and try to best ensure false positives are de minimis. In a recent

[30] https://blog.hiya.com/number-rotation-undermines-consumer-spam-protections-kyc-recap

ex parte filing TNS remarked, "The algorithm utilizes machine learning and artificial intelligence ("AI") tools to analyze telephone numbers and individual voice calls. Moreover, the algorithm is constantly being evaluated against the "ground truth" and updated or adjusted on a regular basis. All of this ensures labels are accurate and meaningful to consumers."[31] And yet the perception and response from callers persists.

The industry should adopt a goal to develop ways a caller can be confident of accurate treatment of their calls so that callers willingly use less numbers and less complex dialing plans. This may not only curb number rotation practices by legitimate entities but also enable service providers, federal and state agencies, and law enforcement to better identify and address number rotation by bad actors.

2.2.3. Lack of Visibility into the Use of Numbers in the Secondary Market

Visibility into the use of numbers on the secondary market is limited. VoIP resellers are typically more lightly regulated and among other things, it is unclear whether wholesale service providers that support the secondary market are required to or able to effectively report secondary market use cases in the NRUF [see Appendix for further details on NRUF reporting and compliance].

Unlike the direct access providers, regulators currently do not have clear visibility into the utilization of the numbering resources associated with telephone numbers obtained through the secondary market. Consequently, the secondary market can present challenges for ensuring proper usage of numbers. All service providers should adhere to existing industry numbering guidelines, as well as incorporate general Know Your Customer (KYC) practices. Some service providers are unaware how their numbers are being used by their customers or by their customer's customers.

Intermediate reporting providers, who acquire unassigned numbering resources from primary carriers to redistribute them within the secondary market, are a critical part of the communications ecosystem. However, current NRUF reporting does not always reflect the full picture of how numbering resources are used by these providers, particularly when numbers are passed through multiple levels of wholesale providers. Some key concerns include:

- **Inconsistent reporting:** Inconsistent reporting on wholesale and enterprise customer transactions leads to gaps in the NRUF data. Reporting discrepancies can make it difficult for federal and state regulators to assess the true utilization of numbering resources and the potential risks of area code exhaustion. Service providers, including those in the secondary market, who fail to maintain accurate number usage data and/or who submit inaccurate NRUF reports may, at the request of NANPA, the Pooling Administrator, or a state

[31] https://www.fcc.gov/ecfs/document/10320125724891/1

commission, be recipients of "for cause" audits by the FCC, as well as potential forfeitures.[32]

- **Underreported intermediate reporting provider use:** Intermediate reporting providers that do not report unassigned numbers obtained from other providers may contribute to the limited visibility into the full scale of number utilization in the secondary market. In another example from a state, it was found that nearly all service providers doing business identify customers as assigned rather than intermediate. Some providers may classify numbers as assigned even when they are not in use by an end user. For the limited number of providers utilizing the intermediate category, the notes field appears to be underutilized. Only a limited number of providers with wholesale intermediate customers are reporting block activity in the U3 category.
- **U3 category:** The U3 category in NRUF is designed to capture utilization of intermediate number resources obtained from another carrier. Intermediate reporting providers following Thousands-Block (NPA-NXX-X) & Central Office Code (NPA-NXX) Administration Guidelines (TBCOCAG) are required to report the non-rural numbers they obtain and redistribute using the U3 form in the NRUF.[33] Lack of reporting may be due to service providers that either are not educated on properly reporting NRUF data or believe the existing rules around the intermediate category and subsequent additional reporting from the U3 category do not apply to them. Lack of reporting can make it difficult for regulators to fully assess the flow of numbers in the secondary market and accurately evaluate the risk of number exhaustion.

2.2.4. Industry Traceback Group analysis

The Industry Traceback Group (ITG) serves as the FCC's registered traceback consortium and plays a leading role tracing suspected illegal call campaigns to their source and supporting U.S. government enforcement against illegal robocalls. Some campaigns traced by the ITG are spoofed, whereas some may rely on real numbers, whether obtained on the secondary market or otherwise. While the ITG does not have a formal mechanism to confirm whether a given call is spoofed, based on analysis conducted by the ITG of tracebacks initiated in 2024, illegal telemarketing calls appear to more frequently come from valid numbers than from spoofed numbers. The ITG believes this is likely the case because numbers used to make such calls are assigned to providers with large wholesale businesses and not with providers for whom a greater portion of their business is retail customers. In these cases, the provider assigned the originating number typically is not the originating provider and may not be in the call path altogether. This situation contrasts

[32] See: As in the matter of Global NAPs California, Inc. Apparent Liability for Forfeiture, FCC DA 09-2375

[33] ATIS-0300119- Thousands-Block (NPA-NXX-X) & Central Office Code (NPA-NXX) Administration Guidelines (COCAG) Section 4.4.3
The CO Code/ Thousands-Block Holders who report Intermediate Numbers shall provide the name and contact information to the NANPA of the Telecommunications Carriers that have received numbers. These other Telecommunication Carriers, e.g., Reseller, Type 1 Interconnection Service Provider, and Interconnected VoIP SPs shall be responsible to provide NRUF Form 502 number utilization data to the NANPA.

to fraud campaigns assessed by the ITG, where there is a far broader distribution of providers to whom the originating numbers are assigned, including more retail providers.

2.3. The use of U.S. North American Numbering Plan numbers for calls that originate abroad and terminate in the U.S. market

The use of NANP numbers for calls that originate abroad and terminate in the U.S. market can be broken into two categories:

1. Calls where the end user is abroad, but the Originating Service Provider (OSP) is a U.S. service provider, and
2. Calls where the OSP is a foreign service provider.

There are multiple use cases for calls to originate where the end user is abroad, but the OSP is a U.S. service provider, including 4G/5G roaming and U.S. companies with remote foreign employees. Regardless of the use case, from the perspective of all service providers other than the OSP, these calls appear to be U.S. originated calls.

There are multiple use cases for calls to originate where the OSP is a foreign service provider including 2G/3G roaming, foreign companies wishing to use and present U.S. calling numbers, and foreign companies performing calling on behalf of U.S. companies. It is important to consider these legitimate use cases when attempting to implement solutions to prevent illegal calls using these U.S. calling numbers from entering the U.S. from abroad.

2.4. International number usage restrictions and the effect of similar Commission action on providers, consumers, businesses, and illegal robocallers

As discussed elsewhere in this Report, large assignments of telephone numbers to robocallers and rotation of those numbers have become a significant issue. Although the international data is limited, looking at number usage restrictions in place in other countries can provide a useful lens through which to evaluate potential solutions to these challenges.

2.4.1. Numbering Policies and Impacts in Countries Outside the U.S.

Around the globe, access to numbering resources is critical for driving new technological advancements and fostering diverse, competitive business models across industries. Telephone numbers are foundational to a wide array of innovations beyond traditional phone services, supporting everything from internet-connected devices to new forms of digital communication. Imposing stringent restrictions on numbering resources may risk creating unnecessary

administrative burdens, stifling innovative business models, and preventing competition that distinguishes emerging providers from incumbents.[34]

In some countries, however, there are strict and often cumbersome regulations around access to numbering resources, ostensibly aimed at preventing misuse, such as fraudulent robocalling. For example:

- **Germany** requires a utility bill to confirm the address tied to any newly requested telephone number, ostensibly to verify the user's identity. Service providers must retain this documentation and produce it upon demand.
- **Australia** implements a system that tightly regulates numbering resources based on specific use cases, creating a highly regulated environment.

While these restrictive frameworks may be intended to limit bad actors, they also introduce substantial overhead and stifle innovation. Notably, such limitations do not appear to have positively impacted GDP growth or economic dynamism in these countries. By focusing on prescriptive control, these policies hinder the rapid and flexible deployment of new services that rely on numbering resources, placing additional costs on legitimate businesses without demonstrable economic benefit.

2.4.2. Implications of Introducing Similar Policies in the U.S.

If the U.S. were to adopt comparable restrictions, the likely effects would be significant and potentially detrimental to innovation, competition, and consumer choice:

- **Impact on Providers**: Requiring extensive vetting processes for acquiring numbering resources would disproportionately impact smaller and emerging providers, who may lack the resources for complex compliance processes. This could drive market consolidation, advantaging large incumbent players who benefit from economies of scale, while reducing competition from newer, innovative entrants.
- **Impact on Innovation and Economic Growth**: Restrictive numbering policies could create friction for businesses that rely on flexible, scalable communication solutions. By limiting access to numbering resources, the regulatory environment could curtail the development of new business models, particularly for start-ups and small businesses. Such limitations could dampen economic growth, as evidenced by the lack of significant GDP growth attributed to strict numbering policies in other countries.
- **Technology-Neutral Approach**: Any numbering regulations must be technology-neutral to avoid unintentional biases or inefficiencies. Communications technology is constantly evolving, and numbering resources support a range of applications beyond traditional

[34] https://docs.fcc.gov/public/attachments/FCC-17-133A1.pdf

phone calls, such as internet-based services and digital identity frameworks. Singling out specific technologies for stricter regulation could create an uneven playing field and stifle innovation.

- **Impact on Illegal Robocallers**: While stricter verification requirements may hinder some illegal activities, determined bad actors may still find ways to circumvent these rules. However, recent efforts by mobile providers have significantly increased tracebacks, helping to identify and deter sources of illegal robocalls more effectively. Historical patterns indicate that prescriptive regulations are not a comprehensive solution for stopping illegal robocalls; rather, they place greater administrative burdens on legitimate businesses without effectively deterring bad actors.[35]

In summary, imposing stringent and prescriptive numbering restrictions may risk harming the innovation in the ecosystem, reducing competition, and slowing economic growth. The U.S. should continue fostering an environment that encourages innovation by maintaining a balanced approach to numbering resources, ensuring that policies support new and emerging business models while avoiding overly burdensome requirements that stymie growth. Recommendations in this report should be much more effective at stopping bad actors and increasing transparency.

2.5. The practice of direct access authorization holders supplying telephone numbers to customers on a trial basis

The provision of numbers to customers on a limited-time ("free trial") basis involves supplying temporary telephone numbers to evaluate services, test functionalities, or explore new offerings without requiring a customer commitment to a long-term contract or purchase. During these trials, potential customers can test calling, routing, messaging, and AI-based features. A variety of direct authorization holders, including CLECs, VoIP providers, as well as secondary market participants, offer free trials. The trial period duration varies by provider, typically ranging from seven to thirty days.

2.5.1. Benefits of trial numbers

Offering telephone numbers on a trial basis can significantly enhance market penetration for service providers. By lowering entry barriers, providers can attract new customers, providing a risk-free opportunity to evaluate the service. This approach appeals to a broader audience, including those hesitant to switch providers or commit to long-term contracts without firsthand experience.

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[35] Federal Communications Commission, *FCC Submits TRACED Act Annual Report to Congress* (2023), 16, https://www.fcc.gov/document/fcc-submits-traced-act-annual-report-2023-congress

Free trials enable service providers to showcase their offerings. For customers, trial periods allow them to evaluate the quality of a service or product without financial commitments. This hands-on experience can assist end users in making informed decisions across multiple providers, and ultimately benefit competition between providers and encourage innovation.

2.5.2. Trial number restrictions

Many service providers place limitations on the use of trial numbers to minimize the potential for abuse and manage costs. These limitations include:

- **Single or low number accounts**: Typically, only one number can be assigned per trial account, though these numbers may include multiple extensions. Some providers may also allow for a higher number of trial numbers per account. Acquiring a different number often requires releasing the one actively being used by the trial account.
- **Usage caps**: Providers may impose caps on usage, such as limited talk minutes, message quotas, or offering a small free trial credit balance. Some services may also limit the functionality available during the trial period, reserving advanced features for paid subscribers.
- **Inactivity limits**: Unused trial numbers may be removed for inactivity.
- **Call duration:** Providers may limit the duration of calls made with trial numbers and/or remove trial accounts for repeated short-duration calls.
- **Concurrent calling**: Providers may limit the number of concurrent calls that can be made from trial accounts.

2.5.3. Fraud prevention

In addition to service restrictions, providers may elect to closely monitor trial accounts for fraudulent or suspicious activity. Most providers employ a risk management framework designed to evaluate both new and existing trial accounts for patterns indicative of fraud. Accounts identified as potentially problematic are typically flagged for further examination. If an account is flagged, providers may initiate an internal investigation into the traffic associated with the trial account.

In instances where suspected violations occur, providers may take a range of actions, including contacting the account holder, terminating the account, and instituting preventative measures to block re-registration. If an account is flagged as high-risk for fraud, providers may require trial account holders to submit further KYC documentation to verify their identity. This may include personal identification documents, a Certificate of Incorporation, Employer Identification Number (EIN), business cards, BBB membership, or other relevant legitimizing documents. If an account is found to be engaged in fraudulent activities, providers typically implement measures to prevent

the re-registration of the offending users. These measures may include blocking associated IP addresses, email domains, and financial accounts linked to the banned account.

While still preliminary, the ITG is working to initiate a "number trace" pilot to explore a new mechanism to complement the ITG's existing traceback mechanism. Specifically, to complement given tracebacks of one or more calls in a suspected illegal call campaign for which the ITG has reason to believe the caller is using real numbers, rather than relying on spoofed numbers, the ITG will initiate a "number trace." The "number trace" will begin with the provider assigned the number used for the suspected illegal call and seek information on the entity to which that provider gave access to such number. The ITG will then seek information from the next entity and continue hop-by-hop developing a "chain-of-custody" for the number until reaching the entity that gave the caller access to the number or a roadblock to completing the "number trace," such as a non-responsive entity.

The ITG believes that "number traces," if successful, will yield important information regarding how actors responsible for suspected illegal robocalls get access to numbers, as well as directly disrupt their pathways to do so.

2.5.4. Trial number recycling and reclamation

Once a trial period concludes and the customer opts not to continue with paid services, providers typically follow a structured process for recycling and reassigning trial numbers. The timing for this recycling process can vary depending on the provider's policies. In many cases, providers reclaim trial numbers immediately upon the conclusion of the trial period or deactivation of the account.

Other providers may implement a brief grace period after the closing of the trial, but before recycling trial numbers. This period allows for the resolution of any outstanding issues or administrative tasks associated with the trial account. Grace periods generally range from three to ten days, after which the numbers are reclaimed and prepared for reallocation.

2.5.5. Trial sign-up

Service providers offer various number types, including toll-free, and local numbers, covering both NANP and international numbers. Certain premium area codes may be restricted from use as trial numbers, often those within exhausted Numbering Plan Areas (NPAs).

During trial sign-ups, service providers may require potential customers to provide specific information such as Name, Email, and Phone Number. Additionally, Billing Name, Credit Card Number, Credit Card Expiration, CVV, and Billing Address are often required.

Users typically must agree to the provider's Terms & Services, Acceptable Use Policy, and/or Privacy Policy during sign-up. These policies outline the approved uses of the platform,

prohibiting illegal activities, spamming, ID spoofing, intellectual property infringement, or other forms of fraud. Providers reserve the right to limit or terminate services if an account holder violates these terms.

2.5.6. Trial Number Best Practices

The following are best practices that can be adopted by service providers offering trial accounts and numbers:

- **KYC Certification Requirement for Trial Accounts:** Implementing a KYC certification process might increase the likelihood that individuals registering for trial accounts are properly verified. This could be done either by collecting a valid payment form (such as credit card information) or verifying the user's identity. By requiring a payment method (even if no charge is made during the trial), or verifying identity documents, service providers can deter fraudulent activity, reduce the likelihood of abuse, and ensure that trial accounts are associated with legitimate individuals. This extra layer of authentication might help prevent malicious actors from exploiting free trials for spam, phishing, or other illegal activities.
- **Increased Internal Monitoring and Usage Tracking for Trial Accounts:** Service providers should establish enhanced internal monitoring systems specifically designed for trial accounts. This would involve tracking key usage metrics like call duration, login patterns, and network usage. This data should be analyzed in real-time to identify any unusual patterns or activities that could signal abuse, such as spam, robocalls, or other inappropriate behavior. By closely monitoring trial accounts, service providers can identify potential bad actors early and take immediate action, such as suspension or termination of the account, thereby protecting both their platform and other users.
- **Call/Message Limits and a Limit on Simultaneous Calls:** Imposing reasonable limits on the number of calls and messages sent from trial accounts can significantly reduce the risk of misuse. For instance, service providers can set daily or weekly limits on the number of outbound calls or messages, and place caps on the number of concurrent calls allowed from a single account. This prevents trial users from leveraging their accounts for mass communication campaigns, like spam or robocalling, while still allowing genuine users to evaluate the service under normal circumstances. Limiting simultaneous calls also helps prevent instances where one account is used to flood multiple phone lines or exploit network resources.
- **Short Time Boundaries (e.g., Three-Day Free Trial Instead of 30 Days):** Reducing the duration of free trials is another effective way to limit abuse while still providing potential customers the opportunity to experience the service. A shorter trial period, such as three days instead of 30, minimizes the window in which fraudulent or abusive activity can occur. Shorter trial periods force users to make quicker decisions about the service, reducing the likelihood of users repeatedly signing up with different accounts to exploit long-term access for free. Service providers can further support this with flexible pricing

structures or low-cost introductory offers that encourage legitimate sign-ups after the short trial ends.

- **Restrict Trial Accounts from Using Numbers in Jeopardy Area Codes:** To prevent trial accounts from being used in near-depleted geographic areas, service providers can impose restrictions on the phone numbers that trial users are allowed to access. By blocking trial accounts from utilizing phone numbers from jeopardy area codes, service providers can protect against potential abuse that might contribute to the depletion of phone numbers. This ensures that valuable numbering resources are reserved for legitimate long-term customers and prevents malicious actors from targeting specific area codes known for vulnerability to fraud.

2.6. The use of such "trial basis" numbers to engage in illegal robocalling, spoofing, or fraud

In its attempt to provide the Commission with information about the extent to which trial numbers are used to engage in illegal robocalling, spoofing, or fraud, the CATA WG learned that this information is not currently easily obtained. While anecdotal information may provide examples of the use of trial numbers to engage in illegal activity, the CATA WG was unable to determine whether such abuse is widespread. Adoption and enforcement by providers that offer trial numbers of the restrictions and best practices described above could minimize the ability of bad actors to abuse trial numbers.

The ITG collects data on a voluntary basis from U.S. and foreign-based originating service providers regarding whether the customer is a trial or new customer in most cases. In the ITG's experience, originating service providers have identified trial customers in 15% of completed tracebacks. An additional 40% identify a customer who has been a customer for less than three months. This information pertains to whether the calling customer themself is reported as a trial user; it may not pertain to whether the number is a trial number. Indeed, depending on the platform, the calling customer could be spoofing a number, relying on a number obtained in the secondary market or otherwise, or relying on the platform provider for number access. The ITG currently lacks data to determine which of these scenarios applies in a given traceback but may gain additional insights in some cases as part of the number trace pilot discussed above.

2.7. The potential effect on direct access authorization holders in the event of a Commission prohibition on providing numbers on a trial basis

As discussed above, trial numbers serve as a valuable tool to allow potential customers to try new services prior to purchase. Prohibiting this practice would deprive consumers of a significant way to evaluate and compare services and is not recommended.

2.8. The effect of supplying telephone numbers to customers on a trial basis on numbering resource exhaust

It is generally presumed that numbers assigned for services provided on a trial basis are expected to become permanently assigned to customers. The take-rate on such trial services is dependent upon the value that the customer realizes. Thus, it is difficult to calculate a specific take-rate for trial services that assign numbers on a permanent basis and may be dramatically different from one service provider to another. Additionally, access to data used to determine the average take-rate of trial services and the associated telephone numbers is generally unavailable as this type of data may be considered competitively sensitive.

The impact this has upon number exhaust is further complicated based upon the incremental capacity provided through one-thousand block numbering resource allocation. Unless the trial services and associated numbers are marketed on a similar order of magnitude, the take-rate of a trial service and associated telephone numbers may have little incremental impact on the rate of number utilization. However, factors that may result in impacts to number exhaust are trials for services that require large quantities of numbers such as call center services or large businesses.

3. Conclusions and Recommendations

In its Direct Access Order, the Commission recognized the benefits of extending direct access to numbering resources to interconnected VoIP providers, including improved visibility into the use of telephone numbers and enforcement of its numbering rules. The Commission also highlighted that its Order enforced policy goals of counteracting number exhaust, ensuring continuance of efficient number utilization and providing adequate safeguards to prevent bad actors from gaining direct access to numbers.[36] As this Report demonstrates, these benefits seem to be lacking in the secondary market.

The CATA WG acknowledges the importance of the secondary market in the allocation of numbering resources. The NRUF reporting process offers a valuable, albeit incomplete, window into the secondary market, where numbers change hands through one or more intermediaries. By improving visibility into reporting, regulators can better understand how numbering resources are flowing through the secondary market.

The CATA WG believes that the current framework for NRUF reporting, when properly followed, may provide transparency into the secondary market. Enhancing compliance with existing NRUF obligations for intermediate number administration may provide the insights needed to manage numbering resources more effectively.

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[36] *Direct Access Order,* at ¶2, ¶16 and ¶22.

Specific Report recommendations are:

- **Improve NRUF reporting compliance:** The FCC should encourage providers to comply with existing reporting requirements, particularly in relation to intermediate number administration and wholesale transactions. Such compliance can also provide information to help identify bad actors. As many providers likely have automated processes in place for the NRUF reporting process, it is important to focus on improving the accuracy and consistency of current reporting.
- **Increase access to numbering data:** The FCC should work with the States to get access to additional data sources. States would benefit from expanded access to other numbering databases, such as the LERG Routing Guide, to supplement their understanding of how numbering resources are being utilized in both the direct and secondary markets.
- **Utilize FCC auditing authority:** The FCC should use its auditing authority to curtail any improper use of numbering resources. It can begin with entities identified by state regulators, state AGs, the Federal Trade Commission, the U.S. Department of Justice, other law enforcement agencies and private entities as having engaged in improper use of numbering resources.
- **Enforce numbering rules strictly:** The FCC should strictly enforce its numbering rules and thereby remind providers that failure to comply with industry guidelines and Commission rules regarding numbering resources could result in revocation of authorization, the inability to obtain additional numbers pending revocation, reclamation of unassigned numbers already obtained directly from the Numbering Administrators, and/or enforcement action.
- **Improve call treatment analytics**: The industry should adopt a goal for continuous improvement of ways a caller can be confident of proper call treatment of their calls so that callers willingly use less numbers and less complex dialing plans.
- **Do not adopt international use restrictions**: The U.S. should not adopt the limited international numbering restrictions described in this Report to avoid harming innovation, reducing competition, and slowing economic growth, but consider the other CATA WG recommendations.
- **Endorse ITG "number traces" if successful:** Should the ITG's "number trace" pilot be successful, the FCC should formally endorse the ITG's use of such number traces in its role as the registered U.S. traceback consortium and require providers to cooperate with such traces.
- **Follow Best Practices:** The FCC should encourage providers with direct access to numbers to adopt general KYC obligations regarding the use of numbers sold or leased to providers operating in the secondary market. Such compliance can give the Commission a source of information regarding secondary market number use. Further, to minimize the abuse of trial numbers and trial accounts, the FCC should consider encouraging providers that offer trial numbers or trial accounts to adopt the specific Best Practices discussed in this Report.

4. Glossary

Assigned Numbers – Numbers working in the Public Switched Telephone Network under an agreement such as a contract or tariff at the request of specific end users or customers for their use, or numbers not yet working but having a customer service order pending. Numbers that are not yet working and have a service order pending for more than five days shall not be classified as assigned numbers. 47 C.F.R. §52.15(f)(1)(iii).

Caller Identity (Caller ID) – The originating phone number included in call signaling used to identify the caller for call screening purposes. In some cases, this may be the Calling Line Identification or Public User Identity.

Customer – Typically a service provider's subscriber, which may or not be the ultimate end-user of the telecommunications service.

End-User – The entity ultimately consuming the voice service and may include the end-user's device used for placing the call.

Enterprise – A business, non-governmental organization, or government entity that is a user of voice services. An enterprise may have direct relationships with any type of service provider, or service or TN reseller described in this document, and may have indirect relationships with any of these entities. An enterprise may initiate calls directly on its own behalf or may contract with other entities (e.g., call centers or hosted service providers) to initiate calls on its behalf. [ATIS-1000089]

FCC – Federal Communications Commission. The FCC may also be referred to in this document as "the Commission."

FCC Registration Number (FRN) – A ten-digit number assigned by the FCC to an entity that does business with the FCC.

FCC Form 499-A – An FCC multi-purpose form used for annual reporting revenues which are used as the basis for federal fund assessments, funding of some administrative functions, sharing costs for some telephone service administration, and calculating regulatory fees; and one-time (with obligation to revise if information changes) designation of an agent for service of process, and fulfillment of obligations to register with the FCC by law.

Identity – Unless otherwise qualified, an identifier that unambiguously distinguishes an entity for authentication and other security and policy application purposes.

Interconnected VoIP Service Provider – An entity that provides interconnected VoIP service, as that term is defined in 47 U.S.C. § 153(25) (47 CFR § 52.5 (b)). Interconnected VoIP providers are providers of a service that (1) enables real-time, two-way voice communications, (2) requires a broadband connection from the user's location, (3) requires Internet protocol-compatible customer

premises equipment, and (4) permits users generally to receive calls that originate on the public switched telephone network and to terminate calls to the public switched telephone network (47 CFR § 9.3).

Intermediate Numbers – Numbers that is made available for use by another telecommunications carrier or non-carrier entity for the purpose of providing telecommunications service to an end user or customer. Numbers ported for the purpose of transferring an established customer's service to another service provider shall not be classified as intermediate numbers. 47 C.F.R. §52.15(f)(1)(v).

Intermediate Reporting Provider – The definition as it relates to the NRUF is a carrier that receives numbers from another carrier. NRUF Form 502 Geographic Job Aid (Oct. 2024, Section 13).

North American Numbering Plan (NANP) – Numbering Plan for the public switched telephone network in the US and its territories, Canada, and the Caribbean.

North American Numbering Plan Administrator (NANPA) – Neutral third-party administrator of NANP numbering resources, subject to directives from regulatory authorities in the countries that share the NANP.

Numbering Resource Utilization/Forecast (NRUF) – Report used for collecting, storing, and maintaining number resource utilization and forecast data.

Operating Company Number (OCN) – Company code assigned by the National Exchange Carrier Association (NECA) and used for reporting NRUF data.

Originating Service Provider (OSP) – The service provider that handles the outgoing calls from a customer at the point at which they are entering the public network. The OSP performs the STIR/SHAKEN authentication function. The OSP may also serve in the role as TNSP, Resp Org, TN reseller and other roles. [ATIS-1000089]

Reporting Carrier – A telecommunications carrier that receives numbering resources from the NANPA, the Pooling Administrator or another telecommunications carrier. 47 C.F.R. §52.15(f)(2).

Secondary Market – The acquisition of telephone numbers from a service provider with direct access to numbers by a carrier or other communications provider in support of resale service offerings, including numbers, including numbers obtained from a reseller or carrier partner. Second Report and Order, WC Docket Nos. 20-67 at ¶71, footnote 239.

Service Provider – A telecommunications carrier or other entity that receives numbering resources from the NANPA, a Pooling Administrator or a telecommunications carrier for the purpose of providing or establishing telecommunications service. For the purposes of this part, the term "service provider" includes an interconnected VoIP service provider. 47 C.F.R. §52.5(e).

SIP – Session Initiation Protocol is the foundational signaling protocol for creating, modifying, and terminating voice calls on internet protocol (IP) networks. [RFC3261]

Terminating Service Provider (TSP) – The voice service provider of the called party. The TSP performs the STIR/SHAKEN verification function.

TN Reseller – The party who holds the right-to-use a TN and offers for resale the right-to-use that TN. Alternatively, "A provider which purchases facilities and/or services from a Service Provider for resale." ATIS-0300068 at page 13.

TN Validation – A process by which an indirect end-user's authorization to use a telephone number or set of telephone numbers is established and the process of sharing that information to the service provider originating the call onto the telephone network using existing and upcoming standardized secure mechanisms. TN Validation can be performed at the time the right-to-use of telephone numbers is established and/or throughout the life of a contract.

Vetting – A process by which a customer's identity and operational legitimacy is confirmed by their service provider. Confirmation can be performed at the time service is established (initial confirmation of identity) and/or throughout the life of a service subscription or contract (i.e., the ongoing evaluation of traffic patterns indicative of abusive robocalling). TNs are not part of the vetting process and are covered by the TN Validation process.

Voice Service Provider (VSP) – A service provider whose network is interconnected to other service providers to both originate and terminate calls across the telephone network. The VSP is responsible for performing the STIR/SHAKEN Authentication function when acting as the OSP and the STIR/SHAKEN Verification functions when acting as the TSP. [ATIS-1000089]

Appendix. Additional NRUF reporting details

While the definition of the telephone number secondary market is reasonably clear, there have been difficulties arriving at a consensus view of compliance with respect to NRUF reporting requirements for the secondary market or NRUF's relevance as a data source for issues surrounding illegal calling. Additionally, challenges have been observed with the practicality of compliance within deeper layers of the secondary market.

The Code of Federal Regulations (CFR) Title 47, Chapter I, subchapter B, Part 52, subpart B, section 52.15 Central office code administration defines mandatory reporting requirements. Section 52.15(f)(2) Reporting Carrier states:

The term "reporting carrier" refers to a telecommunications carrier that receives numbering resources from the NANPA, a Pooling Administrator or another telecommunications carrier.

There is emphasis on the word "carrier" in this citation and in the NANPA NRUF Geographic Job Aid section 2.3 "Carriers Not Required to Submit NRUF Reports," which states:

A non-carrier that receives numbering resources from a carrier is not required to submit an NRUF Form 502. Examples of non-carriers are retailers and unified messaging service providers. **A carrier or non-carrier that receives numbers through "resold" services should not report on these numbers**. (emphasis added)

The word "carrier" as used in the CFR and the NANPA NRUF Geographic Job Aid are not in clear conflict with each other, but these clauses do present a challenge for state regulators tasked with usefully managing number utilization within their jurisdictions and for service providers in determining whether they must file an NRUF Form 502. "Carrier" may be interpreted narrowly to be limited to the statutory definition of "telecommunications carrier," which does not include interconnected VoIP providers and would lead to gaps in reporting. This narrow interpretation of "reporting carrier" disregards 47 C.F.R. § 52.15(g)(3)(x)(B) that requires all interconnected VoIP providers to "[c]omply with the applicable Commission numbering rules in this part; numbering authority delegated to the states; and industry guidelines and practices regarding numbering as applicable to telecommunications carriers."

The interpretation of "resold" services in the Job Aid may also lead to gaps in reporting. Some service providers interpret "resold" broadly to apply to all numbers received by a carrier or non-carrier from a service provider with direct access to numbering resources. This interpretation may lead to gaps in NRUF reporting for all numbers that are not obtained directly from NANPA or the Pooling Administrator. If all Assigned Numbers obtained through the secondary market are not included in NRUF reporting, NANPA would be unable to calculate utilization levels to effectively forecast the availability of numbering resources to meet the current and future needs of the

industry as required by Commission rule.[37] As noted elsewhere in this Report, NRUF reports are often insufficient for gaining material insight into number assignments deeper than the service provider with direct access to numbering resources.

As a practical matter, ordinary business relationships between ordinate and subordinate actors in the secondary market inhibit usage reporting of assignments with any specificity if for no other reason than protecting proprietary relationships between subordinate numbering administrators and their carrier or enterprise/agency customers.

[37] 47 C.F.R. §52.13(b)(2).